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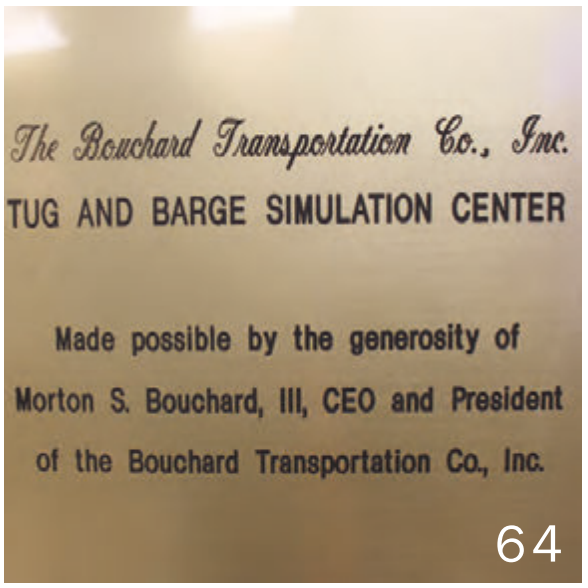

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IN THIS EDITION

WORKBOATS NORWAY STYLE

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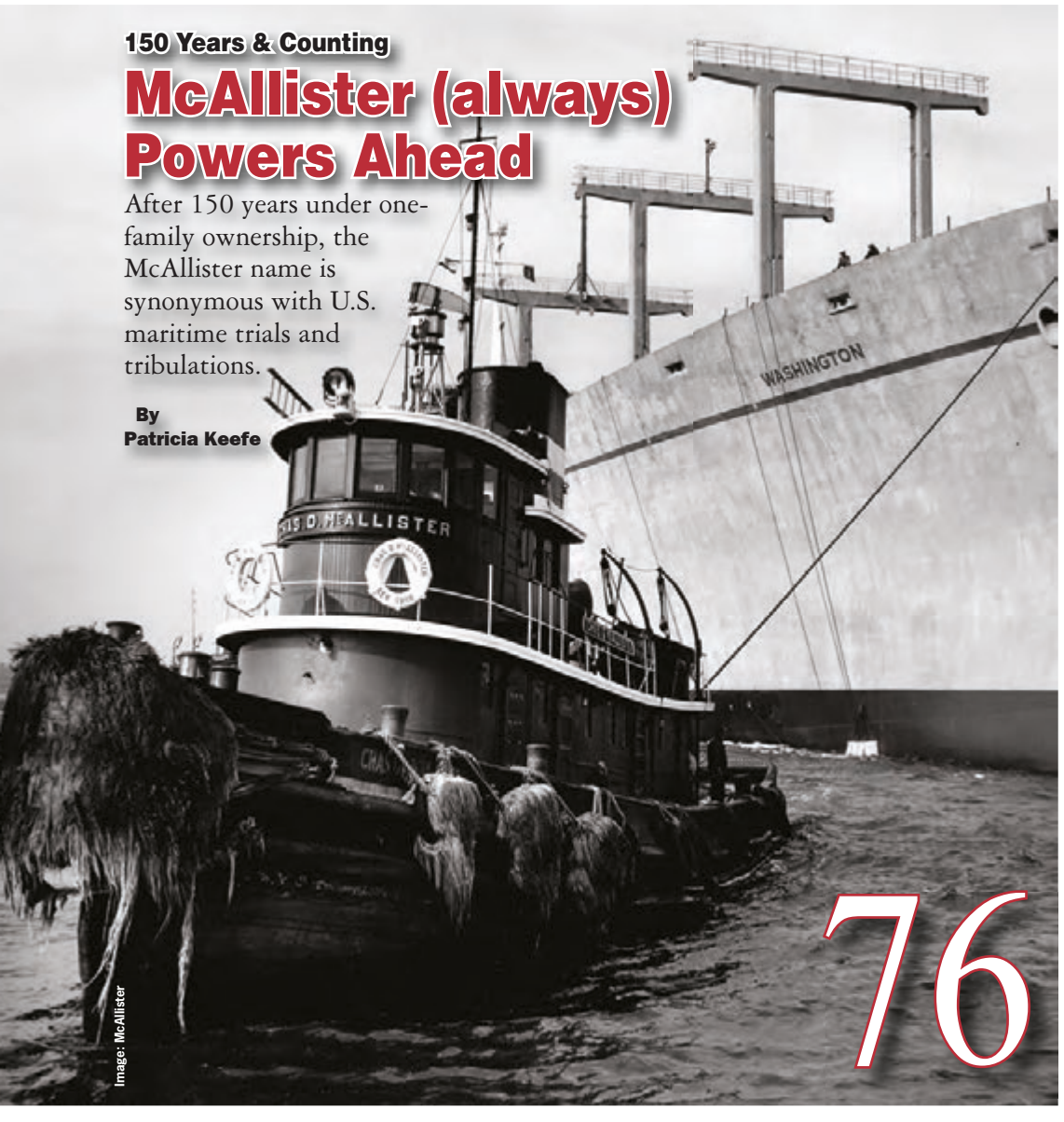
The McAllister name is synonymous with the U.S. maritime industry, and as this ubiquitous company celebrates its 150th anniversary, we visit with fourth and fifth generation leadership to discuss the path ahead for this venerable company. Pictured on the cover is the Eric McAllister, a 98 x 36 ft. tractor tug built by Senesco, classed by ABS and powered by a pair of CAT 3516 CHD Tier III engines driving two Schottel Z-Drives.
Read more starting on page 76.

Cover Image: Courtesy Seaman's Church Institute, McAllister Towing



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MARITIME REPORTER AND ENGINEERING NEWS

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75, 150 ... What's in a Number?

GREG TRAUTHWEIN, EDITOR & ASSOCIATE PUBLISHER

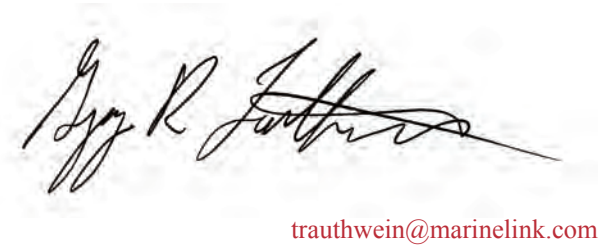
It is not often that I break out the tux for my editorial picture, but this special edition dictates. I know that I should argue that all of our editions are special, but this one in particular, I must admit, stands out in a number of ways.

In fact, all of 2014 has been somewhat 'special,' as the domestic maritime business has rebounded with a vigor, driven in no small part by an unprecedented energy boom in the U.S. that looks like it will make the country energy independent by 2020. Political gamesmanship and manipulation of energy pricing by OPEC aside, the development of the new energy business in the U.S. and the resulting impact on the maritime markets, domestic and foreign, are real, deep and significant for a generation to come. The year 2014 is also, if you haven't figured out by now, the 75th anniversary of *Maritime Reporter & Engineering News*, the flagship title of our fast expanding media group. While 75 is impressive, McAllister Towing's celebration of its 150th anniversary is a step beyond.

To write this story there was no one better than Patricia Keefe, who has written our centerpiece 75th anniversary story each edition this year, and will continue in our pages in 2015 and beyond. No one I have ever worked with digs into a story with the journalistic zeal of Tish, and when you step back and look at McAllister Towing, there is plenty of meat on that story bone.

McAllister Towing is personal for me because I have known Brian McAllister (as many of you have, too) for almost all of my 20+ years in this post, and the ties between the McAllister's and the O'Malley's extends decades beyond my tenure. McAllister Towing is personal because it is New York City based, a few subway stops from our office; a ubiquitous presence in and around the New York waterways. But the McAllister Towing story is far more than a feel-good New York piece, as the story is about success and strife; it's about opportunity and investment; it's about strong personalities, strange tales and multiple generations, particularly now as the fifth generation takes the wheel. **In short, McAllister Towing is quintessential maritime.** 2014 has been a strong investment year for the company, adding three ultra-modern Z-Drive tugs to its fleet, including the Eric McAllister featured on the cover. Turn to page 76 of this edition for our 10-page feature of one of the stronger names in U.S. maritime circles.

Another interesting piece that ties this edition together nice is Dennis Bryant's "Avoiding the Edges of the Sea" on page 22. In usual Dennis Bryant fashion he delivers a strong message on a burning topic in a fast and enjoyable read. His piece this month addresses how technology has (and still does) instill a false sense of complacency among mariners. I found this particularly interesting as on a recent travel swing I have checked in at four separate providers of maritime simulation services, and to put it mildly, there is a strong surge of investment in this area. Last month I ventured out to the inauguration of the Bouchard Tug and Barge Simulation Center at SUNY Maritime, and on the side Morton S. Bouchard III summed it up nicely: **"You cannot be profitable in this industry unless you are safe. You cannot be safe unless you train."**



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FLA Pilot Rate Reductions:

... Not so fast ...

The push to reduce some pilotage rates in the port of Miami has at least temporarily run hard aground.

Hard aground: That's exactly where local pilots hope the effort to reduce their wages earned on board Miami-based cruise ships will stay. But the $1.6 million in annual relief sought by their biggest collective customer base in the region still has cruise operators clinging to the hope that the earlier decision to drop local pilot rates by 25 percent on cruise traffic will stand. Nevertheless, the first rate reduction for domestic U.S. state pilots anywhere in many decades (if ever) is anything but a done deal.

Earlier this year (August 21st), we reported in this venue on a rapidly developing situation in the port of Miami where cruise vessels advocates had pushed for and in fact gotten the local regulators to approve a pilot rate reduction. The decision was expected to be appealed, and it was. And, according to local sources, the Rate Committee granted a stay until the appeal is decided and there is no deadline for the court to rule.

In a nutshell, and on August 1, the Board of Pilots Commissioners Rate Review Committee voted to approve the application to decrease the pilotage fees for cruise ships at the Port of Miami by 25 percent. The next step is for the Florida Attorney General's Office to draft an order detailing the committee's findings. Once the order is written, a meeting will be scheduled for the committee to review and approve the order. If approved, the order will be signed by the committee chair and filed with the department. But, that sequence doesn't take into consideration the lengthy delay that the appeal process might entail. And, there is no firm timeline for that to happen.

Chelsea Eagle, from the Office of Communications, Florida Department of Business and Professional Regulation, in an E-mail correspondence with MarPro, said, "As of today, there is currently a stay from the District Court of Appeals while the Board of Pilot Commissioners Rate Review Committee considers a motion submitted by the Biscayne Bay Pilots Association." Beth Frady, Deputy Director of Communications with the Florida Department of Business and Professional Regulation told MarPro this week, "Following the court's ruling, the Rate Committee will enter an order unless the Rate Committee is directed to conduct a new proceeding by the court. The Committee's order will be appealable to the Division of Administrative Hearings for a trial type proceeding and/or back to the District Court of Appeal." And, there you have it. Sounds like a long process to me.

I encourage everyone to go back and read my previous blog to get a real feel for what is happening. That said; the bottom line here is that, for most stakeholders nationwide, fighting a rate increase request from a state-sanctioned pilot monopoly group is hard enough. Achieving a rate reduction might be viewed as a bridge too far. For everyone but the well-organized Florida Cruise lobby, that is. And, if they can't get it done here, what chance does anyone else have, anywhere else, in holding the line against the continually escalating charges for pilot services?

I don't actually know what the average salary or compensation package for the typical marine pilot in the United States amounts to. That said; it amounts to far more than anyone else makes around the globe. That much is certain. It also dwarfs the (reasonably good) compensation for the garden variety ship's master (U.S. and/or foreign flag), who, arguably shoulder far more responsibilities, under more difficult circumstances and for periods of time that can span many months. What's reasonable? I don't know, but in answer to the age old question (asked of parents everywhere on our crumbling Interstate highways) of "Are we there yet?" – yes, we certainly are.

This much is certain: What happens next in Florida will set the tone for the inevitable pilot rate scuffles that will follow, in places like Houston, Lake Charles, San Francisco, and two dozen ports just like them. At a time when freight rates for bulkers aren't enough to provide the slimmest of operating cushions, with the containership alliances in a similar, precarious position, and with tankers not in much better shape (aside from the protected Jones Act trades), stakeholders are starting to develop a backbone as pilot charges for a single port call can and do exceed $12,000. If I've said it once, I've said it a dozen times: there's nothing like a pilot rate war. This one will be no different.

– MarPro

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
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SHIP OP COSTS

Ship Operating Costs
Decline Slightly

While conventional wisdom suggests that costs rise in step with time, it appears that ship owners and manager, faced with historically tight markets, continue to defy conventional wisdom as total annual operating costs in the shipping industry fell by an average of 0.3% in 2013, on the heels of a 1.8% decline the previous year. Crew costs was the only category this time to show an increase over the 12 month period, indicating that ship owners continued to focus on managing costs and conserving cash in 2013.

The findings published in OpCost 2014, Moore Stephens' ship operating costs benchmarking tool, which reveals that total operating costs for the tanker sector were up in 2013, the financial year covered by the study, but down in the bulker and container ship sectors. The tanker index was up by 2 points, or 1.1%, while both the bulker index and the container ship index were down by 2 points, or 1.2%, on a year-on-year basis.

In addition:

- There was a 0.2% overall average rise in 2013 crew costs compared to the 2012 figure, which itself was 0.2% down on 2011. (By way of comparison, the 2008 report revealed a 21% increase in this category.)
- Tankers overall experienced an increase in crew costs of 1.8% on average, compared to the 2.3% fall recorded in 2012. Within the tanker sector, Handysize product tankers reported an overall increase of 3.3% in crew costs.
- For bulkers, the overall average fall in crew costs was 0.5%, the same as in the previous year. The operators of Panamax bulkers paid 2.3% less in crew costs than in 2012, but there was a 1.2% increase in this respect for Handysize bulkers, this following a 4.8% reduction for 2012. Expenditure on crew costs remained unchanged over the 12 month period in the container ship sector.
- Expenditure on stores was down this time by 1.9% overall, compared to the fall of 2.1% in 2012.
- There was an overall fall in repair and maintenance costs of 0.4%, compared to the 1.9% reduction recorded for 2012.
- The overall drop in costs of 0.3% recorded in respect of insurance compares to the 6.2% fall recorded for 2012.

Carnival Corp.
Clearing the Air; Saving Billions

While fuel costs are enjoying a moderate break at the moment, overwhelming consensus regarding future energy cost trends is nowhere but up, particularly as increasingly stringent emission rules kick-in globally over the next seven years. To that end, industry leaders such a as Carnival Corp. are making strategic plans now, such as its recently announced multiyear Fuel Conservation Program that the company said is expected to save more than one billion gallons of fuel and $2.5 billion in fuel costs, while reducing carbon emissions by 12 billion kilograms by the end of 2014; it fleet of more than 100 ships will see 24 percent improvement in fuel efficiency from 2007 through 2014.

Carnival Corporation & plc released the results of its multiyear Fleet Fuel Conservation Program that states by the end of 2014 the cruise company will have saved more than one billion gallons of fuel and reduced fleet carbon emissions by 12 billion kg over a seven year period.

How Carnival Did It ...

Carnival Corporation's Fleet Fuel Conservation Program combines energy-saving programs onboard current ships with new energy-efficient ship designs to reduce energy consumption and boost fuel efficiency across its fleet of more than 100 ships.

Since cruise ships generate their own electricity from fuel, Carnival set out to uncover every feasible way to reduce onboard energy usage and launched several key conservation initiatives since 2007 that have driven the success of the Fleet Fuel Conservation Program. These efforts include:

- **Propulsion**: Improving how the ship moves through the water by optimizing ship speeds and cruise distances to design more fuel-efficient itineraries, significantly reducing energy and fuel consumption.

$400 million

Carnival investment to design, build and install exhaust gas cleaning technology, called ECO-EGC, to more than 70% of its fleet.

- **Hull coatings**: Using new hull coatings and cleaning technologies to minimize the growth of marine organisms that create drag on the hull, which reduces the amount of fuel needed to move the ship through water.

- **Air conditioning**: Installing new, energy-efficient A/C systems to help reduce the energy used to cool the ships, which is the second largest consumer of onboard energy after propulsion.

- **Lighting**: Replacing traditional lighting with more efficient LED bulbs is an ongoing opportunity to save energy, as the company continues the process of replacing four million lights across the fleet.

24%

Percentage that the Carnival fleet is more fuel efficient today versus 2007. In that span, it estimates it saved **1 billion gallons** of fuel and **$2.5 billion** in fuel costs.

- **Water production**: While producing 73% of water used onboard its ships, Carnival is reducing the rate of onboard water usage and finding more efficient ways to produce water, including better use of engine heat to convert sea water to fresh water and installation of reverse osmosis systems.

- **Education & Training**: Increasing onboard energy use awareness among officers, crew and guests.

New ship builds also drive significant improvements in fleet fuel efficiency through energy-saving innovations that are designed directly into the new vessels.

By adding more than 30 new ships to its fleet since 2007, Carnival Corporation has capitalized on the latest advances in energy efficiency, including building larger ships with highly efficient propulsion systems that incorporate new computer-modeled hull designs and the latest in fuel-efficient propeller and engine combinations.

Driven largely by its energy and fuel conservation efforts, Carnival is now in a position to exceed its goal of a 20 percent reduction in carbon emissions by 2015. Carnival Corporation is investing as much as $400 million to design, build and install an industry-first exhaust gas cleaning technology, called ECO-EGC, to more than 70 percent of its fleet. The system uses filters and seawater to remove pollutants from exhaust gases, significantly advancing cleaner air quality for oceangoing vessels.

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Maritime Piracy

Attacks Down, But Regional Concerns Remain

While the issue of maritime piracy has largely fallen from the public eye, with the rapid evolution of the 24/7/365 news cycle and a never-ending list of new and globally interesting headlines, such as Ebola, there remains concerns of piracy's effects on the broader maritime market, particularly in SE Asia.

According to the International Chamber of Commerce (ICC) International Maritime Bureau's (IMB) latest piracy report, maritime pirate attacks globally are down for three years running, but there is a worrisome trend of small tanker hijacks by armed gangs escalating in Southeast Asia.

The latest report reveals a total of 178 incidents so far this year, down from 352 for same period in 2011. In the first nine months of 2014, pirates killed three crew, kidnapped five from their vessels and took 369 seafarers hostage. A total of 17 vessels were hijacked, 124 were boarded and 10 were fired upon. There were 27 further reports of attempted attacks. By location, Indonesia is far and away the worst area in 2014 with 72, followed by Bangladesh (15); Malaysia (15) and Nigeria (13).

Oil Thieves

IMB's Piracy Reporting Center said gangs of thieves armed with knives and guns are making Southeast Asian waters increasingly dangerous for small tankers carrying products such as gasoil or marine diesel oil. Boarding the ship at sea, pirates hold the crew hostage for a short time while they unload all or part of the cargo, which they then use, or sell locally. Of the six vessels hijacked worldwide in the third quarter of 2014, five were in Southeast Asia. Looking at the chart of the types of ships attacked in the first nine months of this year, Product Tanker is far and away the largest category with 44 attacks, followed by bulk carrier (34); chemical tanker (22); tanker (21); general cargo (14); containership (13) and LPG Tanker (7). Indonesia recorded 72 incidents between January and September, including 67 armed robberies and five hijackings. In two separate hijackings off Pulau Bintan in September, 26 crew were taken hostage. Elsewhere in Indonesia 59 vessels were boarded and there were eight attempted attacks. Waters off Pulau Bintan saw more attacks than any other area in the world, with 27 incidents reported. The incidents were low level thefts or attempted thefts from vessels at anchor or berthed. The report commends the efforts taken by the Indonesian Marine Police in addressing the problem areas.

Hostages Remain in Somalia

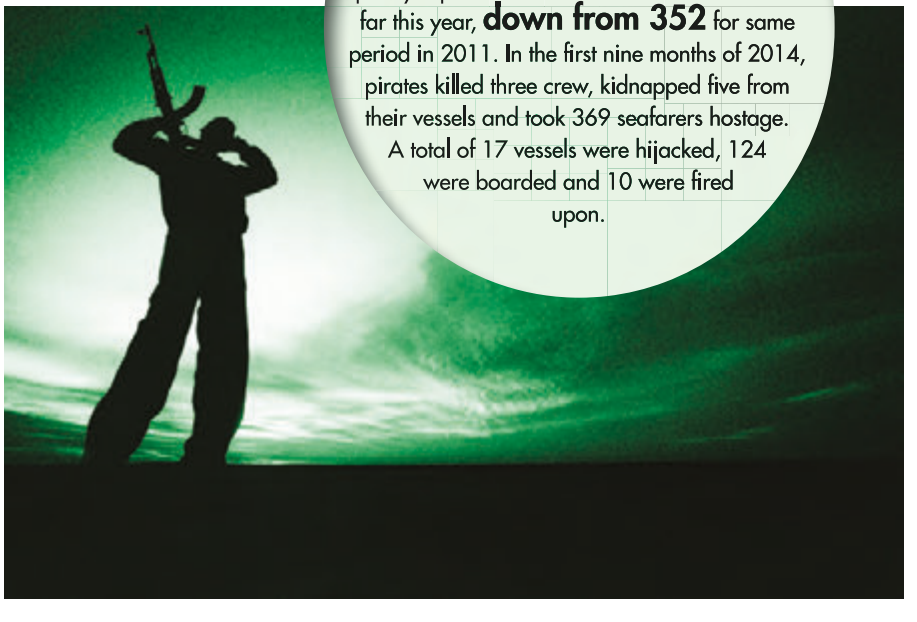
With just 10 incidents reported so far in Somalia this year, there is a risk that international attention will turn away from the 40 hostages still being held for ransom by suspected Somali pirates.

"Some of those crewmembers have been held captive there for more than four years now, with fading hopes of immediate release," said Pottengal Mukundan, IMB Director, adding that seafarers should not underestimate the continuing threat of Somali piracy.

The number of incidents reported in Nigeria has dropped noticeably, down to 13 in the first nine months of 2014, from 29 in the same period last year. Elsewhere in the Gulf of Guinea, Ghana recorded four incidents in 2014 compared with no incidents in 2013. This includes the hijacking of two product tankers – and theft of their cargoes – and a fishing vessel and the taking hostage of 86 crew members.

178

The latest International Maritime Bureau's piracy report reveals a total of 178 incidents so far this year, **down from 352** for same period in 2011. In the first nine months of 2014, pirates killed three crew, kidnapped five from their vessels and took 369 seafarers hostage. A total of 17 vessels were hijacked, 124 were boarded and 10 were fired upon.



Energy Efficiency

Get your share of a $310B Global Market

Energy has always been big business. Now, with a spate of increasingly stringent emission rules sweeping industry, it appears that 'energy efficiency' has become big business too, as the International Energy Agency said that the global energy efficiency market is worth at least $310 billion a year and growing. The report – IEA's Energy Efficiency Market Report 2014 – also finds that energy efficiency finance is becoming an established market segment, with innovative new products and standards helping to overcome risks and bringing stability and confidence to the market.

5%

Reduction of energy consumption between 2001-2011 among 18 IEA countries evaluated.

40%

Percentage of energy efficiency market financed with debt and equity.

The annual report showed that among 18 IEA countries evaluated in the report, total final energy consumption was down 5% between 2001 and 2011 primarily as a result of investments in energy efficiency. Cumulative avoided energy consumption over the decade from energy efficiency in IEA countries was 1,732 million tonnes of oil equivalent (Mtoe) – larger than the energy demand of the United States and Germany combined in 2012.

According to the IEA, some 40 percent of the global energy efficiency market is financed with debt and equity, meaning that the financial market for energy efficiency is in the range of $120 billion per year.

The number of products and the volume of finance have expanded, with green bonds, corporate green bonds, energy performance contracts, private commitments, carbon and climate finance, and multilateral development banks and bilateral banks all offering expanded sources of finance for energy efficiency improvements.

CRUISE

Cruise Market's Seismic Shift

Carnival Corp. inked a historic MOU with China State Shipbuilding Corporation (CSSC) to focus on building the first-ever, world-class cruise ships in China The significance of October 14, 2014 will only be properly put in context many years down the road, but for now Carnival's announcement serves as a wake-up call for the European yards who have dominated this sector for decades. While the ink on the deal is still fresh, it's worthy to remember that intention and execution in the cruise sector are wholly different matters; just ask Mitsubishi Heavy Industries, Ltd. which just took a a $357m loss as it exits the cruise shipping business. The sniff test on this deal points to success, as it includes the world's largest cruise company and a traditional European cruise shipbuilding power – Fincantieri – teaming to work with CSSC on the project.

They said it ...

"Bucky was a key player in (Hurricane) Sandy. While everyone else was at home worrying about family, he was in the Coast Guard headquarters on Staten Island working with the Coast Guard, NOAA, and other agencies to make sure the harbor was operating as normal as quick as possible."

"There is a comradery at McAllister. Employees recognize the tremendous loyalty and obligation to carry on the family tradition. They treat employees like family, 'We're all in this together.' I think Bucky is an integral part of developing this comradery – **he's a roll-up the shirtsleeves, 'I'm with you, let's get this done,' kind of guy."**

Edward J. Kelly, Executive Director, Maritime Association of the Port of NY & NJ, commenting about the long-tenured and good relationship with **Buckley McAllister (pictured)** president, McAllister Towing.

"You cannot be profitable in this industry unless you are safe. **You cannot be safe unless you train."**

Morton S. Bouchard, III speaking at the opening of the Bouchard Transportation Co. Inc. Tug & Barge Simulation Center at SUNY Maritime.

"This is the second successive year-on-year reduction in operating costs. Crew costs were the only category of expenditure to show an increase over the 12-month period covered by the survey. This time it was a comparatively small rise for an industry which had seen increases of more than 20 percent at their peak."

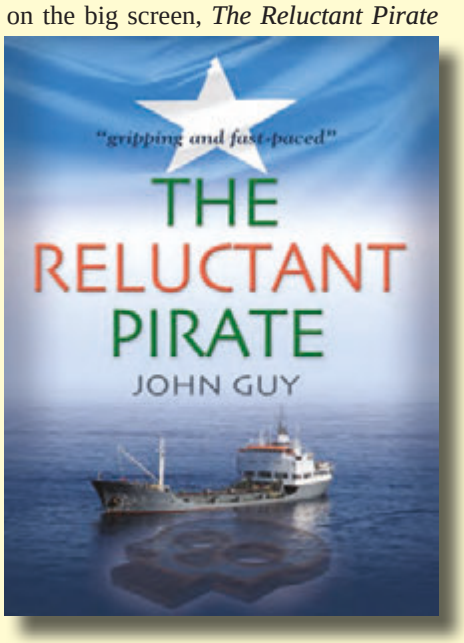
Richard Greiner, partner, Moore Stephens, in discussion the firm's OpCost 2014 report which analyzes global ship operating cost trends.

(Photo: Moore Stephens)

You read it ...

The Reluctant Pirate

John Guy's newest effort, *The Reluctant Pirate*, is an entertaining tale of modern day pirates and a primer on what really happens when today's merchant ships are boarded and held for ransom, and more importantly, why. And unlike the better known movie (Captain Phillips) that tackles a similar subject on the big screen, *The Reluctant Pirate* digs a bit deeper into the politics of today's piracy business model, the players involved (and their motivations) and reaches into the psyche of the Somali pirate himself.

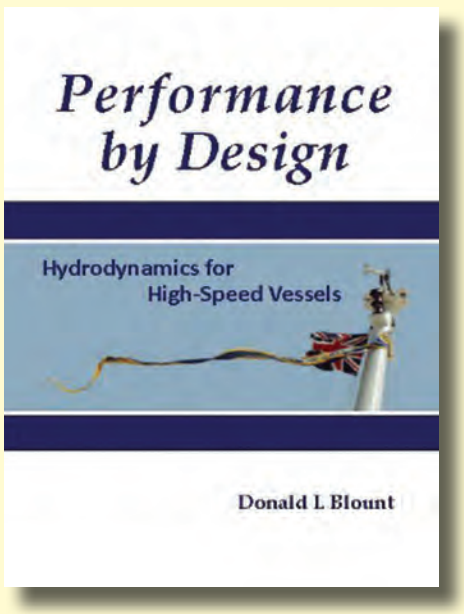


At about 160 pages, *The Reluctant Pirate* is an easy read, but not because of its relatively short length. Fast moving and chock full of action, John Guy skillfully moves us back and forth between London, Norway, Somalia, Greece and out to sea on the waters in between. That's because while the (fictional) book ultimately takes the reader through the machinations of what happens on board during a real incident, it also shows what forces – not all of them benevolent – can be at work elsewhere, once the vessel has been taken. As a mariner with more than a few years of sea service under my belt, I appreciated the accurate portrayal of what goes on at sea. The book is for sale on Amazon.com as a paperback ($8) and as a kindle e book ($3).

– Joe Keefe

Performance by Design:
Hydrodynamics for High-Speed Vessels

Donald L. Blount, founder of Donald L. Blount and Associates, announced the publication of *Performance by Design: Hydrodynamics for High-Speed Vessels*. "My intent has been to share the technical information, decision criteria, rules of thumb, and experiences which have helped me in making choices for developing marine craft intended to operate beyond displacement speeds," said Blount. Although the primary audience for this book is undergraduate university students studying naval architecture and marine engineering, the content is designed to interest most designers working with high-speed craft. The 342-page volume is comprised of ten chapters and several appendices. According to Blount, "Chapter One is a reprise of my article "Original Speed," (*Professional BoatBuilder*, June/July 2008) followed by nine chapters of my views of science, a few things I don't understand, definitions of things on which no two naval architects will agree, design criteria which have been my friend, and guidance on design procedures embracing technology." During his 50-plus year career, he has designed numerous noteworthy vessels including the 67.7 m (222 ft) Destriero, which holds the non-refueled Atlantic crossing record, set in 1992 with an average speed of 53.1 knots.



MARINE FUEL

Glycerine

Is it the next Marine Fuel?

Following a year described as "intense activity," the Glycerine Fuel for Marine Sustainability project (GLEAMS) concluded that Glycerine is a viable, exceptionally clean alternative marine fuel.

The GLEAMS project claims that it has been particularly successful in dispelling the notion that glycerine is unsuitable for use as a fuel due to its physical and chemical properties, as it demonstrated that glycerine could be used as a fuel in compression ignition engines by displaying the glycerine powered GLEAMS emissions test engine at Seawork International 2014. While the use of glycerine has been studied and documented, the GLEAMS team realizes the importance of real-world operation, and the partners committed to an outline plan for its commercial realization, which includes pilot operational usage. The project partners are currently exploring early potential adopters for the technology including wind farm support vessels, research and education vessels, military specialist craft and superyachts. In addition a potential market for 'cold-ironing' (shore power) has been recommended by the project as a special case where subsidies could be available in the UK.

Glycerine is currently produced as a by-product of the bio-diesel industry and is in surplus supply. However, the available quantities are insufficient to power the world's deep-sea shipping fleets but could support a range of smaller vessel types and shore applications. There is potential for a massive increase in glycerine supply from other organic renewable means such as salt-stressed algae.

http://groupspaces.com/GLEAMSInterestGroup/join/

AIDA Cruises

World's First LNG Hybrid Barge

What is reported to be the world's first LNG hybrid barge of Becker Marine Systems was christened Hummel on October 18, 2014, at Grasbrook Quay in HafenCity Hamburg. The godmother of the inaugural event for the floating LNG power plant for environmentally friendly energy supply of cruise ships was Dr. Monika Griefahn, Chief Sustainability Officer at AIDA Cruises.

By using of the floating LNG power plant, emissions and particle discharge will be reduced. Compared to the use of conventional marine diesel with 0.1 percent sulfur content, no sulfur oxides and no soot particles are emitted. Nitrogen oxide emissions will be reduced by up to 80 percent and carbon dioxide emissions by 30 percent.

With the start of the new cruise season in the spring of 2015, it is planned to supply the AIDAsol for the first time with electricity produced from liquefied natural gas (LNG) while it is berthed in the port of Hamburg.

In 2015 it is planned to supply the AIDAsol with electricity produced from liquefied natural gas (LNG) while it is berthed in the port of Hamburg and fueled by Hummel, an LNG hybrid barge.

All ships of the AIDA fleet which were put into service in 2007 or later are already prepared for the use of shore power.

Since 2007 the company has voluntarily used only marine diesel with 0.1 percent sulfur content for the production of energy on board its fleet in the Port of Hamburg. This has been required by law for all seagoing vessels in European ports only since 2010.

Two summers ago the company adopted an additional investment program in the amount of more than $100m for the use of environmental technologies, the core of which is a comprehensive filter system for reducing exhaust gas emissions. The filtration system will be featured on newbuilds, and also will be retrofit on existing ships.

In the spring of 2016, the first ship of the new AIDA generation, AIDAprima, will be moored for the first time in its future home port of Hamburg. AIDAprima is the first cruise ship with a shore power connection, a comprehensive system for exhaust gas aftertreatment, and a dual fuel engine.

WTS LNG Cargo Containment Systems

Wilhelmsen Technical Solutions (WTS) completed the gas trial for the first LNG carrier built to a Boil Off Rate (BOR) of 0.08% per day.

WTS subsidiary company Ti Group completed the test on the LNG carrier Seishu Maru, currently under construction at MHI in Japan for NYK Line.

Ti Group was responsible for supplying the cargo tank insulation system on Seishu Maru, one of six LNG carriers to be delivered in this order. The vessel is a next generation Sayaendo design vessel, with a cargo capacity of 150,000 cu. m. The ship passed its gas trial and was delivered to the owner in late September 2014.

Ti Group provided the insulation systems for six Sayaendo-design 150,000 cubic meter capacity LNG carriers under construction at Mitsubishi Heavy Industries in Japan for NYK/MOL and K-Line.

"Passing the test at a BOR of just 0.08% is a milestone for the project and sets a standard that reflects our knowledge and expertise in this area," said Anstein Sorensen, Ti Group Managing Director. Ti Group provides two options for cargo tank insulation based on different technologies. The panel system is an adaptable solution for LNG/LEG/LPG cargo tanks, with a design that can be fitted to most tank geometries. The company also offers an insulation system for LPG carriers, based on spray foam technology.

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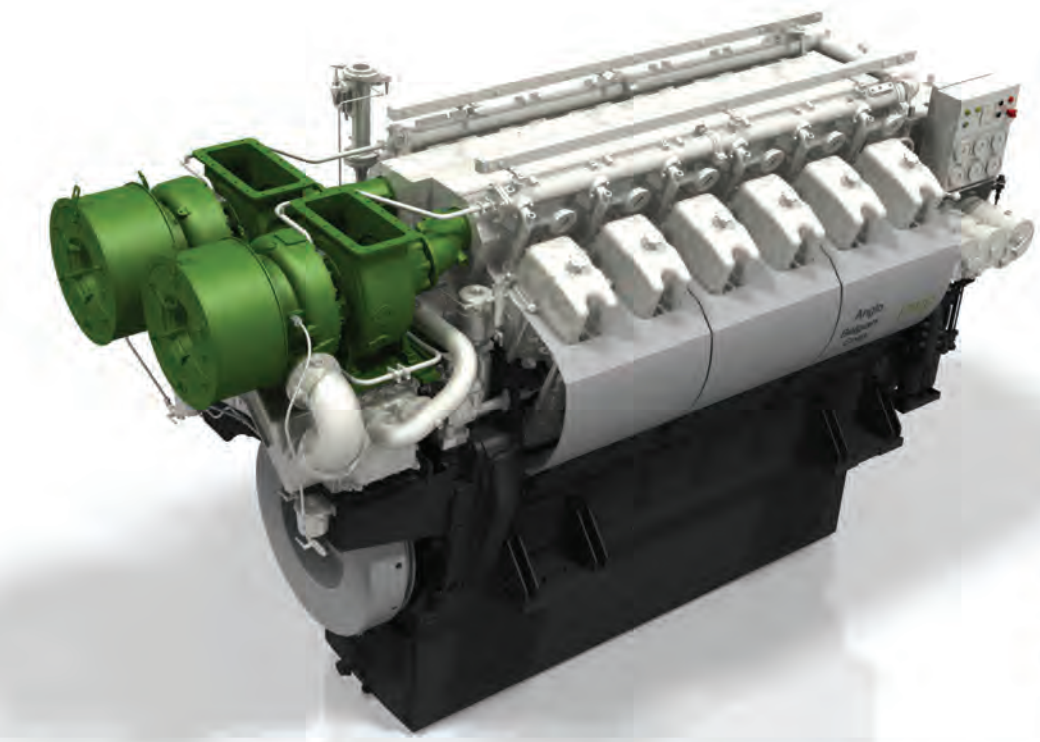

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Jack Buono, president, SeaRiver Maritime, presents a $30,000 gift to the Coast Guard Foundation for its Fallen Heroes Fund.

Commandant of the United State Coast Guard Admiral Paul F. Zukunft.

CGF Event in NYC a Success

The Coast Guard Foundation held its 34th Annual Salute to the United States Coast Guard in New York City in October, an event that raised more than $1m for the Foundation that helps Coast Guard families. There is nothing quite like a black-tie event in New York City, and for those of you who have never attended, the Coast Guard Foundation dinner in New York is highly recommended.

The event is a literal 'Who's Who' drawing some of the biggest names in the maritime industry: ship boat owners, ship and boat builders and executives from nearly every walk of the maritime world, including the Commandant of the United State Coast Guard Admiral Paul F. Zukunft.

But while the event is high on star power, the real focus of the event are the working crew heroes of every day Coast Guard Life, honored with the Coast Guard Foundation Award, as well as each and every family that benefits from the good works of the Coast Guard Foundation, which provides education, support and relief programs to benefit Coast Guard members and their families across the country. Honored were two crews: the Crew of Motor Life Boat 47212, Station Humboldt Bay, and the Crew of CG-6515, Air Station San Franciso, both picutred below.

To learn more about the Coast Guard Foundation or to help support its work, please visit www.coastguardfoundation.org.

From Left: Brian McAllister, Chairman, McAllister Towing & Transportation, who pledged $25k in support of the CGF, with Dawn and Greg Trauthwein.

Petty Officer 2nd Class Victoria Hansen, Petty Officer 2nd Class Louis Ciccoli, Seaman Jacob Roberbs and Seaman Noah Perry with Admiral Paul Zunkunft, Coast Guard Commandant were awarded the Coast Guard Foundation Award.

Lieutenant Commander James Kenshalo, Lieutenant Beau Belanger, Petty Officer 3rd Class Travis Swain and Petty Officer 3rd Class Corey Fix were awarded the Coast Guard Foundation Award.

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The Legal Consequences of 46 CFR Subchapter "M"

BY DANIEL J. FITZGERALD

As the holiday season and the end of another year quickly approaches, the towing industry patiently waits for the Coast Guard to finalize the long-awaited towing vessel inspection rule. More than 10 years ago, Congress passed the Coast Guard and Maritime Transportation Act of 2004, requiring more stringent regulation of uninspected towing vessels (UTVs).

Since that time, the Coast Guard and several industry groups (including the Towing Safety Advisory Committee (TSAC), American Waterways Operators (AWO) and the American Bureau of Shipping) have been working hard to finalize the rulemaking and attendant regulations. The stated intent of the rulemaking is to promote safer work practices and reduce casualties on towing vessels by requiring that vessels adhere to prescribed safety standards and safety management systems or to an alternative, annual Coast Guard inspection regime.

As the Coast Guard finalizes its adjudication of the 3,000 comments received in response to the notice of proposed rulemaking in 2011, let's take this opportunity to consider the obvious and not so obvious legal consequences of such a significant rule.

Obvious Consequences

Civil Penalties

Violations of proscribed safety standards will result in the assessment and collection of civil monetary penalties. The Coast Guard employs Hearing Officers to adjudicate civil penalty cases in support of the Marine Safety mission. In turn, 46 USC §2107 requires standard procedures for the handling of civil penalties for infractions of regulations but an "on the record" hearing within the meaning of the Administrative Procedures Act (APA) is not required. It is yet to be determined whether Coast Guard enforcement activity for towing vessels will be phased in a manner similar to the ballast water standards. Readers will recall that the Coast Guard did not immediately enforce the ballast water management regulations in 2013. Furthermore, it is important to note that the proposed rulemaking sets forth a phased-in scheme, providing a fairly generous timeframe for compliance.

Suspension & Revocation

In the aftermath of marine casualties, Coast Guard Investigating Officers are charged with ascertaining whether credentialed mariners committed acts of misconduct, incompetence, negligence or violations of law. Notably, 46 CFR §5.27 provides that "Misconduct is human behavior which violates some formal, duly established rule. Such rules are found in, among other places, statutes, regulations, the common law, the general maritime law, a ship's regulation or order, or shipping articles and similar sources." The impending towing vessel regulations will provide casualty investigators with some additional bases to craft suspension and revocation charges against credentialed mariners.

Not So Obvious Consequences

Limitation of Liability

Running a vessel or fleet of towing vessels is a risky business and limitation of liability is an important component of maritime law. In short, limitation of liability in the United States permits vessel owners and their insurers to reduce the amount of the potential exposure to the value of the vessel and pending freight. The owner is entitled to limitation if it can establish that the acts or omissions leading to the casualty were not within its "privity or knowledge." Determining whether an owner can limit its liability can hinge upon an analysis of whether any applicable safety regulation was violated. Given this established legal framework, violation of a regulation in the impending Subchapter "M" could form the basis for denying an owner's limitation application. As the publication of Subchapter "M" will put vessel interests on notice of the standards necessary to safely operate towing vessels, owners and operators are encouraged to participate in the Coast Guard's Towing Vessel Bridging Program (TVBP) to ensure they are better informed and prepared to meet the impending requirements in the coming years.

Negligence Per Se

Non-compliance with a Coast Guard regulation "opens the door" for a charge of negligence per se, which is negligence established as a matter of law. In these instances, the breach of the duty is not a jury question. More importantly, a breach of a safety regulation, if proven, could prevent a court from considering the comparative fault of an injured crewmember in a Jones Act lawsuit. Contemplate that an employee is arguably 75% responsible for his own injury but the vessel owner is nonetheless held 100% responsible with no offset because there was a violation of some Subchapter M regulation. Historically, attorneys representing injured seaman often looked to OSHA regulations to establish negligence per se. Now Coast Guard regulations will provide an additional basis in support of injured crewmembers' claims of legal negligence.

Pollution Claims

Under the Oil Pollution Act of 1990, Responsible Parties (RPs) can submit reimbursement claims to the National Pollutions Funds Center (NPFC) for removal costs and damages. RPs may limit their liability if costs and damages incurred exceed the amount of total liability as determined by 33 U.S.C. §2702. However, RPs cannot limit their liabilities if the incident was proximately caused by the violation of an applicable federal safety, construction, or operating regulation by an RP. The NPFC has previously denied reimbursement claims on the basis that applicable safety and operating regulations were violated.

Conclusion

When finalized, the Subchapter "M" Rulemaking will promote safer work practices and should reduce casualties throughout the towing industry. This is what Congress and the Coast Guard intended. As the final rule is published, vessel interests are encouraged to consider the lesser intended and not so obvious consequences of such a significant rulemaking. In the coming year, owners and operators of towing vessels should proceed diligently with "eyes wide open."

The Author

Daniel J. Fitzgerald, Partner at Freehill Hogan & Maher LLP, concentrates his practice in maritime, international, and environmental law in various U.S. and foreign jurisdictions.

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Avoiding the Edges of the Sea

BY DENNIS BRYANT

Mariners do best when they avoid the edges of the sea – the shoals, rocks, and other hard spots. Coming into contact with the edges of the sea at other than a slow walking speed can ruin an otherwise pleasant voyage.

Unfortunately, though, vessels have been making hard contact with the edges since Noah's Ark grounded on Mount Ararat, rendering the Ark unseaworthy.

For a while, it was thought that the leadline would reduce groundings, but one can't be swinging the leadline constantly.

Lighthouses were another early means of identifying hard spots by means other than direct contact. Lighthouses, though, couldn't be erected everywhere and sometimes the light was extinguished or otherwise not visible. On other occasions, the light was misinterpreted.

The first electronic aid to navigation – the radio direction finder or RDF – was seen as a means of providing vessels and their navigators with improved positioning information, thus lowering the risk of coming into contact with the edges of the sea. Faith in the RDF was proven to be misplaced on 8 September 1923 when seven US Navy destroyers, travelling at full speed, grounded in the fog on charted rocks at Honda Point near the north end of the Santa Barbara Channel. Due to poor visibility, the ships, transiting as a squadron from San Francisco to San Diego, were utilizing dead reckoning. A radio signal from a new RDF station was received but misinterpreted. Twenty-three sailors died in the grounding. Two

As predicted by Rudyard Kipling in 1935, we have reached the point where technology has instilled a false sense of complacency in many mariners. Technology only performs its designed tasks if properly programmed and utilized.

On 18 September 2013, the chemical tanker Ovit grounded on the Verne Bank in the Dover Strait. The tanker was utilizing its electronic chart display and information system (ECDIS) as its only means of navigation. The passage from Rotterdam to India was planned by an inexperienced and unsupervised junior officer. **Utilizing the wrong scale, the junior officer laid out a course passing directly over the Verne Bank, which was properly charted and showed a water depth less than the draft of the tanker.** The tanker's position was monitored solely against its intended track as programmed into the ECDIS. The officer of the watch exercised such poor situational awareness that the tanker was aground for nineteen minutes before he so realized.

other destroyers grounded briefly, but refloated themselves. Five destroyers from the rear of the formation were able to avoid grounding. The squadron commander and the squadron navigators, as well as the commanding officers of the seven destroyers that were lost, were all court-martialed.

Radar has proven to be good at assisting mariners in avoiding groundings, but only if it is operating properly and the deck officer on duty is knowledgeable in its use. Sometimes the radar is ignored. Other times it is set on the wrong scale. Radar, though, is only minimally helpful for avoiding low-lying land. It is completely unable to identify shoal water. In those cases, the mariner must rely on other means to identify the danger. Over-reliance on or misinterpretation of radar may lead one to a false sense of security.

On 16 March 2011, the bulk carrier Oliva, carrying 60,000 tonnes of soya beans from Brazil to China, grounded off Nightingale Island in the Tristan da Cunha archipelago in the South Atlantic. At the time, the vessel was travelling at full sea speed (about 12 knots). Transit was planned using the great circle route from Santos, Brazil around the Cape of Good Hope. Unfortunately, the navigating officer used an inappropriate scale in plotting the various legs of the passage. Rather than laying a course to pass ten nautical miles to the southeast of Nightingale Island, the plotted course took the vessel directly to the island. At sea, the vessel was steered primarily by means of autopilot fitted with GPS input. The officer of the watch at the time of the incident saw something ahead on the radar, but thought that it was merely the return from the low-lying storm clouds that he had observed. He did not realize that the clouds were directly over and obscured the large (and hard) island. The grounding ripped open the bottom of the vessel, but the crew was able to evacuate to a passing fishing vessel. The soya beans and the 1,700 tonnes of fuel oil from the Oliva spilled into the sea. Numerous seabirds and other sea life died as a result. The wreck was left to slowly succumb to the sea.

Not all the edges of the sea are natural, some are manmade.

The container ship Cosco Busan allided with a tower of the San Francisco-Oakland Bay Bridge on 7 November 2007. The ship was equipped with modern electronic chart display and information system (ECDIS) navigation equipment, which overlaid the radar display with navigation chart information. The pilot was unfamiliar with the operation of the installed equipment, but proceeded regardless to take the vessel to sea in dense fog. Approaching the bridge, he became confused between the markings for the various towers of the bridge and open channel between the various towers. He tried to ask the crew for guidance, but was prevented from doing so by language difficulties. As a result, the ship made heavy contact with the Delta Tower, tearing open the hull in way of the bunker tanks. A large volume of heavy fuel oil spilled into San Francisco Bay, causing significant property and environmental damage.

On 18 September 2013, the chemical tanker Ovit grounded on the Verne Bank in the Dover Strait. Fortuitously, there were no injuries, no pollution, and only superficial damage to the vessel. The tanker was utilizing its electronic chart display and information system (ECDIS) as its only means of navigation. The passage from Rotterdam to India was planned by an inexperienced and unsupervised junior officer. Utilizing the wrong scale, the junior officer laid out a course passing directly over the Verne Bank, which was properly charted and showed a water depth less than the draft of the tanker. The tanker's position was monitored solely against its intended track as programmed into the ECDIS. The officer of the watch exercised such poor situational awareness that the tanker was aground for nineteen minutes before he so realized.

As noted by the UK Marine Accident Investigation Branch (MAIB) in its report on the Ovit grounding, there are over thirty manufacturers of ECDIS equipment, each with their own designs of user interface and little evidence that a common approach is developing. Generic ECDIS training is mandated, but it is left to flag states and owners to decide whether or not type-specific training is necessary and, if so, how it should be delivered.

While the edges of the sea are most frequently found on rocks, shoals, and docks, they may occasionally be encountered overhead. These edges may consist of high-tension wires or gantry cranes, but more frequently they consist of bridges over troubled waters. On 26 September 2013, the Military Sealift Command (MSC) ro-ro ship USNS 1st LT Harry L. Martin was being towed up the St. Johns River in Jacksonville from one shipyard to another. As it passed under the John Mathews Bridge, its elevated stern ramp made hard contact with the bottom of the bridge span, causing significant damage to both the ship and the bridge. Investigation revealed that the air draft of the ship was five feet greater than shown in the vessel's records. Investigation also revealed that the air gap of the bridge was six feet lower than shown in the records of the bridge owner and the federal government. The lesson here is to not blindly accept everything in writing. It pays to occasionally double-check. The hard edges can be anywhere and everywhere.

Rudyard Kipling had the increased automation of ships in mind when he wrote the Forward to the selection of his prose and verse entitled "A Kipling Pageant" in 1935. That Forward, written as a Letter or Bill of Instruction from the Owner of the Motor Vessel Nakhoda to the Master, included the following:

This new ship here, is fitted according to the reported increase of knowledge among mankind. Namely, she is cumbered, end to end, with bells and trumpets and clocks and wires which, it has been told me, can call Voices out of the air or the waters to con the ship while her crew sleep. But sleep thou lightly, O Nakhoda! It has not yet been told me that the Sea has ceased to be the Sea.

As predicted by Rudyard Kipling in 1935, we have reached the point where technology has instilled a false sense of complacency in many mariners. Technology only performs its designed tasks if properly programmed and utilized. It takes special training to operate many of the systems currently found on merchant vessels. Having an Operator's Manual placed on the bridge is wholly insufficient. Even with the best of technical training, mariners wishing to avoid the edges of the sea should reply most heavily on experience and seamanship.

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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In 2014, Will Congress Pass Any Maritime Legislation?

BY JONATHAN K. WALDRON

Following its usual summer break over August 2014, Congress came back from its five-week summer recess and spent a whopping eight days or so back in session before recessing once again, approximately a week early, to hit the campaign trail for the November elections. This essentially means that including the summer recess, Congress will have been in session for a total of about eight days between the end of July and the middle of November 2014. No wonder why Congress has not been able to accomplish much this year, to date.

As a result, there are a number of maritime-related bills left hanging for consideration should a lame duck session (scheduled to begin the day after Veterans Day, November 12, 2014) actually decide to move legislation this year. Any legislation not enacted by the end of this year will have to be reintroduced in the next Congress, the 114th Congress, which begins in January 2015. That is because each Congress lasts two years, and legislation not enacted by the end of the second year of a Congress dies. The following is a discussion of the situation.

Keeping the Government Funded

A Continuing Resolution (CR) will keep the U.S. government open and funded through December 11, 2014, after Congress returns from the mid-term elections. The CR includes a three percent across-the-board cut in all discretionary spending. The CR also includes authorization for the President to support Syrian rebels with air strikes aimed at the Islamic State of Iraq and the Levant (ISIL). Of course it is impossible to predict whether Senate Leadership will change hands as a result of the elections;

Contrary to the photo, the mood in Washington, particularly regarding maritime matters, is anything but festive.

if it does, however, the CR is likely to be extended into next year, leaving specific budget decisions with a new Congress.

The Coast Guard Authorization Bill

As is typical, the House passed its version of the Coast Guard Authorization bill earlier in the year on April 1, 2014 (H.R. 4005). The Committee on Commerce, Science, and Transportation introduced its version, S. 2444, on June 5, 2014. Despite repeated attempts by this Committee to move S. 2444, however, no other action was taken on the bill prior to the latest recess because of Senate Commerce Committee Chairman Jay Rockefeller's desire to incorporate language to increase federal oversight of cruise passenger protections against the vehement objections of the cruise industry. The following is a discussion of some of the key provisions in the two versions of the Coast Guard Authorization Act.

The House bill would extend assistance to small shipyards through 2016; allow third-party classification societies to issue certificates of inspection, or any other certificates issued by the Coast Guard, to offshore supply vessels; mandate that vessels built to operate in cold waters be equipped with survival craft to ensure that no part of an individual is immersed in water; require that 75 percent of food aid cargo must be carried on vessels owned by U.S. citizens, thereby restoring the cut that took place in last year's Defense Authorization bill; and would require a report on the effect liquid natural gas exports would have on U.S. job creation.

The Senate bill would mandate the Coast Guard to publish a final rule on Automatic Identification Systems (AIS), which would have to be consistent with existing statutory provisions on vessel operations, and create a permitting process to allow a vessel traffic information service to use AIS to transmit navigation and safety information to vessels; mandate the federal government to provide notice of marine casualties to state and tribal government officials; create a fund to ensure the protection and fair treatment of seafarers during investigations; mandate the Coast Guard to publish all written incident plans within 12 hours of an oil spill; and require vessel response plans for Mobile Offshore Drilling Units to incorporate information for a planned response to a worst-case discharge from its response plan.

One key topic addressed by both bills is the treatment of foreign seafarers that have been abandoned in the U.S. or are required to remain in the U.S. to appear as witnesses at Coast Guard or other criminal enforcement proceedings. The Coast Guard has been advocating for this legislation for some time and it is now included in both versions of the bill. The concept is to provide, through a system of payments paid into a new Abandoned Seafarers' Fund established in the Treasury, for the care of seafarers who have been abandoned in the U.S. by their ship owners and operators, or who have to remain in the U.S. as witnesses to potential federal crimes. The Fund is funded in the House bill by penalties assessed against ship owners for violations of the Act to Prevent Pollution from Ships. The Senate bill has a broader payment scheme but, in contrast to the House bill, allows for the provision of a bond or surety by a vessel owner in lieu of detaining a vessel in port.

Key Hearings on the Arctic and the Merchant Marine

The House Coast Guard and Maritime Transportation Subcommittee held hearings on the Arctic and the State of the Merchant Marine on July 23, 2014, and September 10, 2014, respectively. The focus of the Arctic hearing was on the Coast Guard's role in implementing the National Strategy for the Arctic Region and whether other agencies would contribute to the cost of a new polar icebreaker. It is highly unlikely other agencies would assist in such funding and this topic remains controversial particularly in view of the world focus on marine transportation in the Arctic and the role the U.S. will play in this region.

With regard to the merchant marine hearing, much of the focus was on the impact of food aid and other cargo cuts on the U.S. flag-fleet. The hearing also discussed legislation introduced by Chairman Duncan Hunter and Ranking

Member Garamendi, which would require that liquefied natural gas exports be shipped on ships built in the U.S. Chairman Hunter stated at the hearing on the merchant marine that he would ask the Maritime Administrator to appear before the Subcommittee after the Maritime Administration releases its long-awaited maritime strategy. The strategy is scheduled to be released sometime this year for public comment.

The Maritime Security Program

Funding for the MSP continues to be controversial and is having a major impact on U.S.-flag carriers. The Administration requested $186 million to fully fund MSP in FY2015. Although the Senate Transportation/Housing and Urban Development (THUD) Appropriations Bill provided the full amount requested for MSP, the House THUD Appropriations bill contains only $166 million for the program. The House and Senate Appropriations Committees have not yet settled on the level of funding for MSP or worked out a final version of the FY2015 THUD bill.

The issue of MSP funding was also raised during the House Coast Guard Subcommittee hearing, mentioned above. Two witnesses, one representing a MSP carrier and the other a U.S. maritime labor organization, urged for an increase in the per vessel support levels currently authorized for ships in the MSP. The witnesses cited declining Department of Defense ("DOD") and non-DOD government cargoes, and a need to achieve a more level playing field and commercial viability for MSP vessels when competing against foreign-flag vessels, as justification for the MSP per vessel stipend increase.

The TIGER

The Transportation Investment Generating Economic Recovery, or TIGER Discretionary Grant program, provides a unique opportunity for the U.S. Department of Transportation ("DOT") to invest in road, rail, transit, and port projects that promise to achieve critical national objectives. Over the years, Congress has dedicated millions of dollars for TIGER Grants to fund projects that have a significant impact on the nation, a region, or a metropolitan area. While the outcome of the FY2015 budget is unclear, agencies are continuing to spend FY2014 dollars. For example, DOT just announced the award of 72 TIGER grants in 46 states and the District of Columbia. The awards for intermodal projects of national and regional significance included a number of port-related projects, including $20 million for a modernization project at the Port of Seattle, $15 million for a new international terminal at the Virginia Port Authority, and $10.84 million for the rehabilitation of a terminal in Charleston, South Carolina. Looking ahead to 2015, there is a major discrepancy in the budget for this very popular infrastructure grant program between the House ($100 million) and the Senate ($600 million) bills, which will have to be resolved in any final FY2015 spending bill.

Conclusion

In conclusion, it has been a very disappointing year-to-date, to say the least, with regard to Congressional action in many areas, including the maritime sector. In addition, many of the key members of Congress in the maritime sector face tough elections. Even if these members win their elections, it is entirely unclear what action Congress will take when it returns following the elections and which party controls the Senate. As to the Coast Guard Authorization Bill, which has many of the key legislative provisions our industry is following, if the cruise industry continues to oppose cruise passenger protection provisions, it seems likely that the bill will not move this year even if the key leaders of the Senate want to push it. There is a good chance we will be stating the oft-used phrase, "Let's try again next year."

The Author

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Triple-E

BY BASTIEN ABEIL

World's Largest Containership First Tested @ MARIN

MARIN was delighted to take part in a truly historic milestone in the industry when Daewoo Shipbuilding and Marine Engineering (DSME) asked MARIN to investigate the seakeeping ability of what would become the largest container vessel in the world - Maersk Line's Triple-E.

MARIN carried out an extensive scope of work, combining numerical predictions and basin model tests to provide the most complete qualification of the vessel's behavior in various sea conditions. An important yet unfortunately, too rare, feature of this project was that MARIN could count not only on the support of the shipyard but also on that of the future owner. Maersk Line and Maersk Maritime Technology took an active role in the preparations of the different activities, showing clearly its intention to be involved in all parts of the development of its future Triple-E Class. Direct communication lines with the owner were without doubt key to the project's success, since it was possible to account for the owner's wishes right from the project kick-off.

Close Cooperation

Operational information provided by the owner could then be used as input for the preliminary numerical work, as well as for the basin model tests. Using MARIN's in-house strip theory code SHIPMO, a preliminary estimate of the ship motions and accelerations at crucial locations could be achieved for a large number of conditions in a short time. Calculations were also conducted for several conditions with the in-house 3D panel code FATIMA in order to obtain an initial impression of the wave-induced

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We are looking forward to the future delivery of the Express Class Fast support vessels, each powered by five QSK60s for main propulsion. For more information, visit http://marine.cummins.com

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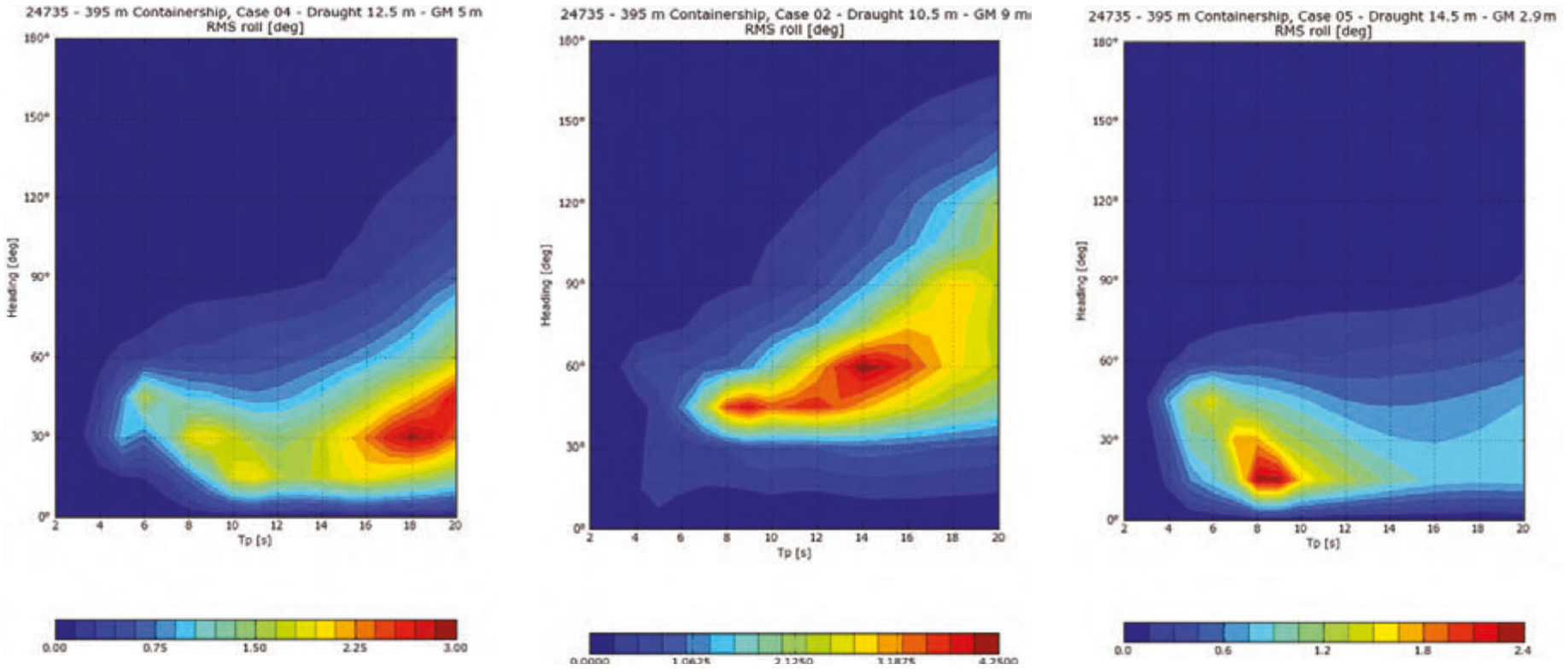
Below are the FATIMA Calculation Results



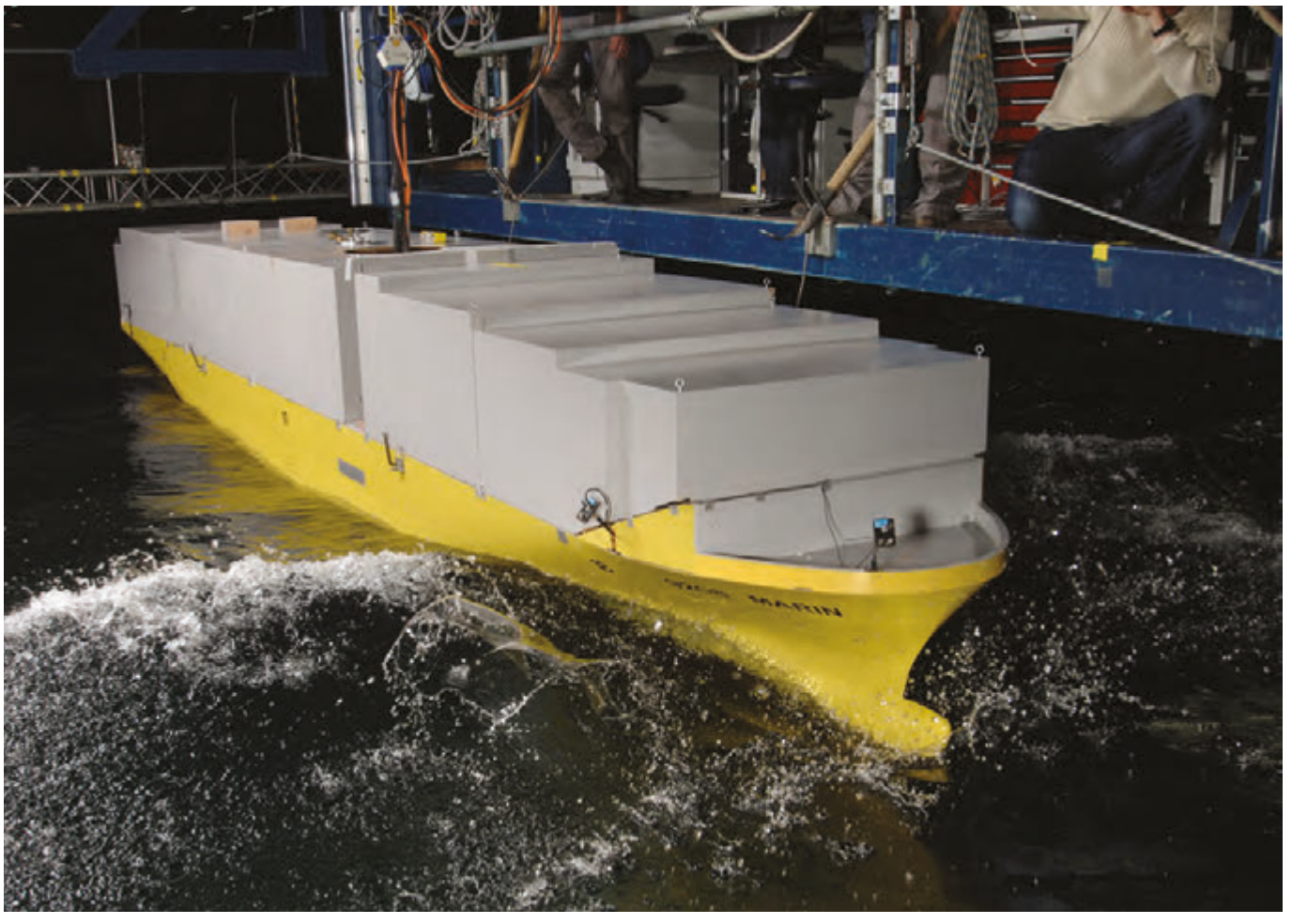
added resistance.

Following the calculations, model tests were carried out in the Seakeeping and Maneuvering Basin. The basin is 170 m long, 40 m wide and 5 m deep. The model tests were performed using a free-sailing, self-propelled scaled model of the container vessel. It is worth noting that the only connections between the model and the carriage consisted of free-hanging wires for measurement and power relay. These did not restrict the model motions in any way.

Roll Behavior

The first series of tests was dedicated to an extended characterization of the rolling behavior of the vessel in the most unfavorable wave conditions. Given the relatively long natural roll periods associated with most of the installed loading conditions in comparison with the range of wave periods, the most unfavourable wave conditions with respect to roll were observed in long waves originating from the stern quarter. The test series also included specific tests to assess the risk of parametric roll. Besides the roll motion, attention was given to the transverse and vertical accelerations generated by the ship motions (mainly roll) at the bridge or on the container lashing system.

The second test series provided a detailed assessment of the vessel's operational performance for several sailing scenarios. The investigation encompassed the quantification of ship motions and associated accelerations, the risk of green water at the bow, slamming at the bow-flare and stern and added resistance due to wind and waves. During the tests a wide array of wave conditions was considered, ranging from normal storm conditions to hurricane-like conditions. The resulting estimates of the risk of green water at the bow and slamming allowed MARIN to validate certain design choices, such as the breakwater or bow-flare angle. Additionally, the measurements of the thrust and torque delivered by the propeller yielded a good estimate of the wave induced added resistance and associated speed loss. It is also worth mentioning that this project thrust MARIN into the spotlight when rather unusually, Maersk Line requested that a film crew were present during the tests. This documentary, *"Maersk Line's Triple-E – the World's Largest Ship,"* is currently on air on the Discovery Channel and is definitely worth a look.



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What's All the Noise at IMO?

BY MICHAEL BAHTIARIAN

Shipping may think they hear the sound of new regulations as they are slammed onto their desks. What is all the noise concerning noise at IMO? This may very well be the question from ship owners, operators and builders closely following activities at the International Maritime Organization (IMO). In 2013, IMO issued mandatory regulations for shipboard airborne noise and earlier this year IMO internal committees approved new draft guidelines for minimizing underwater noise. Even though the author advised the U.S. delegation on both matters, these two codes are not related as they were shaped at IMO. Here is the author's view what the new regulations/ guidelines will mean to the marine community.

Airborne Noise

Since 1981, the IMO has established a guideline for shipboard airborne noise (IMO Resolution A468XII-1981). This guideline included information on sound measurement, acoustic insulation, hearing protection and maximum recommended sound pressure levels by ship compartment type. As noted in the resolution, its purpose was to reduce mariner exposure from noise in order to provide a safe working environment (i.e. ability to hear audible alarms), reduce noise-induced hearing loss (NIHL) and provide an acceptable degree of comfort for the passengers and crew on the ship. Many vessels were designed and built to these guidelines enforced only through the contract between the ship owner and the shipbuilder.

In July 2007, all of the European Union (EU) member states and the European Commission (EC) collectively made the proposal to update the 1981 guidelines with the goal making them mandatory. This occurred under the framework of the 83rd Session of the Maritime Safety Committee (MSC) at the IMO headquarters in London. The reason for making the current IMO guide mandatory was to address a gap in the Safety of Life at Sea (SOLAS) Regulation II-1/36 which "requires that measures be taken to reduce noise in machinery spaces to acceptable levels." As noted in the meeting minutes, "the SOLAS Regulation did not define "acceptable levels," but only provided a reference to the old IMO guideline, A.468." The MSC "work program" was approved and A.468 was given to the Subcommittee on Ship Design & Equipment (DE) Committee of IMO for the detailed review and revision. The work of revising the noise code started at the 53rd DE meeting and progressed through the 56th DE meeting concluding in February 2012. Final approval was granted at 91st meeting of the MSC in November 2012.

This new SOLAS regulation (Chapter II-1/3-12; "Protection against noise" & "Code on noise levels on board ships") requires applicable vessels to be constructed in such a manner that certain types of compartments will have noise levels no higher than specified in the Code. The new Code has mandatory and recommended sections, but the majority of the regulation is required. The Code is only mandatory for ships that are 1,600

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gross tons (GT) or larger and for which the building contract was placed on or after July 1, 2014. The new code will not be applicable to numerous types of vessels such as: dynamically supported craft, high-speed craft, fishing vessels, pipe-laying barges, crane barges, mobile offshore drilling units, pleasure yachts not engaged in trade, naval ships, troopships, ships not propelled by mechanical means, pile driving vessels and dredgers.

An abbreviated list of the noise level limits is given in Table 1 along with the limits which were part of the old A468 code. For the most part, not much has changed from the old to the new noise limits. The only change from the old to the new (1,600 to 10,000 GT) is a decrease for non-specified work spaces. The limit used to be 90 dB(A) and it was reduced to 85 dB(A). The new code further divided the noise limits between less than 10,000 gross tons and greater than 10,000 gross tons. Also in the new Code a couple of room types had 5 dB lower limits for ships that were 10,000 gross tons or larger. The lower limit was put in place due to fact that it is easier to achieve lower limits on physically larger ships.

As it was mentioned above, the author was a participant in the later stages of the new code as part of the United States delegation led by the U.S. Coast Guard (USCG) and their key staff Lieutenant (LT) Nick Woessner and Mr. Wayne Lundy. One need not be apprehensive of the noise limits specified in the new IMO code for ships of 1600 GT and up. These compartment noise limits can be achieved with what have become standard noise control treatments which can be designed into the ship for only a very small percent increase in the total ship acquisition cost. The key to meeting any shipboard noise requirement is to make sure the noise requirements are part of the design process when the ship is built and a good way to make sure the noise limits are achieved is to require a noise evaluation before construction starts. The author's firm has found that dealing with noise requirements after construction can increase the cost by a factor of ten to twenty.

Shipping appears to have received the new noise regulation positively, at least according to Kathy Metcalf the Director of Maritime Affairs at the Chamber of Shipping of America (CSA). She stated that, "The industry has been aware of the process during the development of the airborne noise regulations. The industry in general saw these developments as necessary since they related to the health of the crew on board the vessel and were generally supportive of these developments as they apply to new vessels. Industry concerns related to how or if it would be possible to comply with the requirements for existing ships…is still ongoing."

Table 1

Abbreviated list of noise level limits from IMO 337(91)

(See IMO document for all details)

Designation of rooms and spaces	Limit from A468 (any size)	Ship Size	
		1600 to 10000 gt	≥10,000 GT
Machinery spaces	110*	110	110
Machinery control rooms	75	75	75
Workshops	85	85	85
Non-specified work spaces	90	85	85
Navigating bridge & chartrooms	65	65	65
Look out posts & bridge wings	70	70	70
Radio Rooms	60	60	60
Radar Rooms	65	65	65
Cabins & Hospitals	60	60	55
Mess-Rooms	65	65	60
Recreation Rooms	65	65	60
Open Recreation Areas	75	75	75
Offices	65	65	60
Galleys (without food processing equipment operating)	75	75	75
Serveries and pantries	75	75	75
Spaces not specified	90	90	90

* Not continuously manned. Continuously manned machinery rooms had a 90 dB(A) noise limit

Underwater Noise

Just a little after IMO decided to update "Code on Noise Levels On Board Ships," a proposal was presented by the United States to address noise below the waterline. The lead on this action was taken by U.S. National Oceanic and Atmospheric Administration (NOAA). Dr. Trisha Bergmann was the lead NOAA scientist for the issue, but early work was started by Ms. Lindy Johnson, a NOAA attorney along with others. The proposed guide was developed mostly by correspondence with most of the facilitating performed by both LT Woessner and LCDR Catherine Phillips both of the USCG. The Coast Guard is the administrative lead as they are the head of the U.S. delegation to the IMO. There was vigorous non-governmental organization (NGO) and international participation in the development of the guide especially from the EU nations.

The motivation for introducing the topic of mitigation of underwater noise was the hallmark 2008 conference held in Hamburg. It was sponsored by the Darmstadt, Germany-based Okeanos Foundation for the Sea and brought together experts in mitigation, measurement and effect of anthropogenic (man-made) noise on marine animals and fish. The final report from the Okeanos conference called for a reduction of unintentional ship noise of 3 dB over the next ten years and 10 dB over the next 30 years.

The underwater noise guidelines are not yet officially published by IMO and are assumed to be released in the near future and under the current title, "Guidelines for the Reduction of Underwater Noise from Commercial Shipping." There still is an open question within IMO whether the guideline's title should be revised to include reference to adverse impact of marine life. The body of the guideline is relatively solidified with a draft approved by the IMO's Design & Equipment (DE) Committee in 2013 and the Marine Environment Protection Committee (MEPC) in March 2014.

The guideline's Preamble notes that "Concern has been raised that a significant portion of the underwater noise generated by human activity may be related to commercial shipping." It goes on to note that international (scientific) community recognizes such sound may have both short-term and long-term negative effects on marine mammals and other aquatic life. The proposed guidelines were specifically developed to be applicable to any commercial ship, yet exclude any naval ship or vessel that deliberately puts sound into the ocean, such as seismic or sonar systems used in oil and gas exploration.

As noted in the guide, the purpose of the non-mandatory guidelines is to provide general design advice with respect to the mitigation of vessel generated underwater noise. The guidance is mostly aimed at ship designers, shipbuilders and ship owners. The guide's primary focus is on the main sources of underwater noise generated by propellers and onboard machinery. It also mentions that hull form and operational aspects can be factors as well. Much, if not most, of the underwater noise is caused by propeller cavitation, but onboard machinery and operational modification issues are also relevant. The optimal underwater noise mitigation strategy for any ship should at least consider all relevant issues above.

These Guidelines consider common technologies and measures that may be relevant for most sectors of the commercial shipping industry. Designers, shipbuilders, and ship operators are encouraged to also consider technologies and operational measures not included in these Guidelines, which may be more appropriate for specific applications. The draft guideline contains more detailed information regarding prediction of underwater noise, underwater noise measurement standards, ship design considerations, treatment of on board machinery, additional technologies, operational factors and maintenance considerations. Most importantly, Shipping should be relieved that the draft guideline does not provide any numerical noise limits at this time.

Both the new airborne noise regulation and the draft underwater noise guideline are available from the IMO website. If you have difficulty obtaining the documents, feel free to contact the author.

The Author

Michael Bahtiarian is the Vice President at Noise Control Engineering, LLC and Board Certified in Noise Control Engineering. He was an advisor to the U.S. delegation on the two noise issues discussed in the article.

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BY RICH MERHIGE

BY TERESA DRUGATZ

Cardan Shafts

Review of the basics & Why Precision Alignment is a Must

When it comes to mechanical failures and downtimes, the premature wear of cardan shaft joints is a very common culprit. What causes this premature wearing of the joints? Misalignment. The maintenance of cardan shafts, unfortunately, is often challenging due to their size, function, and accessibility, making their alignment one of the most commonly overlooked, and misunderstood issues a ship's operator can experience.

A cardan shaft is a type of coupling that connects two machines that are offset from one another. One is usually a stationary machine, a motor, or the driver, the other is the machine that will be "driven." Cardan shafts are specifically utilized to allow for the parallel misalignment caused by these two machines being offset. This configuration makes up a drive train, with the cardan shaft transmitting torque, and rotation. In vessels, cardan shafts are placed between the engine and gear box. They are not able to be directly connected to either piece of equipment because movement must be allowed, so it is attached using "universal," or u-joints. A "single" cardan has two u-joints, one at each end. A "double" cardan has three or more of these joints. These allow for necessary movement without becoming uncoupled. To understand the true function and workings of a cardan shaft, it's important to have a good overview of the u-joint's construction, and how they work. The basic makeup of a u-joint consists of two yokes and four pivot pins. A hole in the yoke carries the pivot pins which oscillate as the joint rotates. All of the bearing actually occurs in the tiny space between the pins and the yoke holes they lay within. Because of the movement these joints sustain, ample lubrication is required at all times. To prevent these joints from seizing, lubricant must remain in constant circulation around them, if not, you run the risk of disaster striking. For this reason, cardan shafts are typically installed with a three to six degree angle present at the u-joints. This, however has been challenged time and time again, where case studies have shown that the difference between the angles should be less than 0.25 degrees. And, of course, in a perfect world, with a perfect precision alignment having been performed, the angles would be equal.

Given the way cardan shafts are constructed, and the role they play, do they actually require alignment? Despite the "flexibility" of cardan shafts, and their ability to allow for offset, they are not able to absorb angular misalignment between the shafts. Offset has been shown to have no affect on alignment. Angularity on the other hand, can produce misalignment that results in excessive vibration and speed fluctuations. Angular misalignment can be vertical or, horizontal. If the angular misalignment present is vertical, the motor shaft is under an angle with the pump shaft, but both shafts are still in the same vertical plane. Angular horizontal misalignment is similar, however, both the motor, and pump shafts or on the same horizontal plane. In the situation where a cardan shaft is experiencing angular misalignment, there will be a significant change in rpm's of the driven shaft. The inconsistency of the rotations is commonly referred to as cardan error. This deviation causes vibration, which, triggers a fluctuation in bearing loads, ultimately resulting in premature wearing of components and reduced mechanical life of machinery. The greater the difference in the yoke angles, the worse the misalignment. The greater the misalignment, the worse the variance in speed. When properly aligned, yoke angles are equal to one another when both ends of the shaft are on parallel planes, for both the vertical and horizontal axis.

Besides angularity, phasing is another important concept when it comes to the alignment of cardan shafts. Here, the position of the yokes on both ends must be set parallel, so they fall in line with one another. When the yokes are not set parallel, every time the drive revolves, the driven machine will speed up and slow down twice.

Cardan shafts are, by design, constructed for tight spaces that are not easily accessible. Traditional laser alignment procedures required that the cardan shaft be completely removed in order for alignment to be achieved. An "offset"

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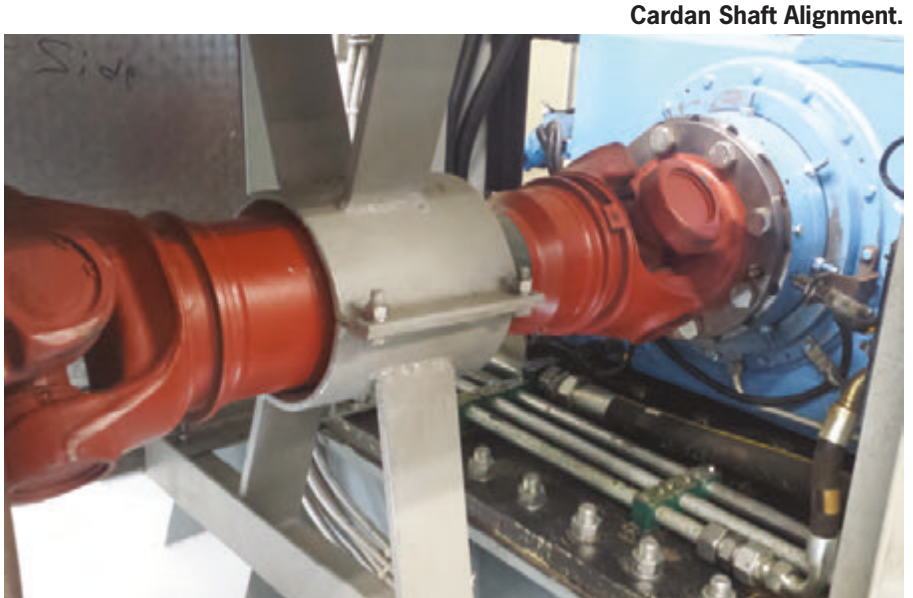
Laser Set-up.

Cardan Shaft Alignment.



fixture, or bracket would be mounted on the coupling flange of the driven machine, with a laser sensor mounted on the rotating part. A second laser sensor would be mounted on the driver. The bracket would allow for virtual positioning of the rotational axis that connects the two machines. Alignment data would then be collected from both the vertical and horizontal planes to determine what adjustments were needed. This method was also necessary when the shafts were not able to be rotated.

Fortunately, technology is ever evolving, and cardan shaft alignments are becoming easier, safer, faster, and, more cost effective. Laser alignment systems, such as those recently acquired by Advanced Mechanical Enterprises/AME, a mechanical engineering services firm for rotating machinery, based in Fort Lauderdale, FL, now have advances that allow for these complex alignments while leaving the cardan shaft in place.

"Our newest system a laser-optical measurement function that now makes in-place alignment possible with the use of two specially designed brackets, along with the standard, handheld computer, laser transmitter, and receiver," said Rich Merhige, President, AME. "One of these brackets is referred to as a chain type, and has a third 'arm' allowing it to be directly mounted to the driver's shaft. The other new bracket has a rotating arm where a sensor is mounted."

As the shafts are turned, the bracket arm, in turn, rotates, allowing for the sensor to move up and down the posts, thus picking up the laser being transmitted. This method is very similar to the traditional alignment performed on standard couplings.

"One of the advantages we have always had in our market is the equipment and knowledge to do cardan shaft alignments," said Merhige. "Now, we are even better equipped to provide our customers with this service since we've upgraded our laser systems. With this equipment, we can still carry out the same precision cardan shaft alignments, but there is no longer a need to remove the cardan shaft. This means reduced service time, which translates into savings for our clients."

Investing in this new equipment, is a significant expense, but has been shown to have a substantial return for companies such as AME. For example, a Gulf-based tow boat that is heavily utilized in the oil industry was in desperate need of a cardan shaft alignment.

"They had needed an (cardan shaft) alignment for some time, put had put it off to avoid taking a financial hit, for what the operators thought would be an extended service period," said Merhige. "When they were finally referred to us, they were relieved to know that we had the technology and Field Service Engineers capable of performing the alignment in less than a day. Needless to say, they were extremely happy with the results, and plan on having us return to perform the same service on the other vessels in their fleet."

While the mechanics of the cardan shaft are complex and can make one timid when it comes to securing proper maintenance services, the reality is, there is now technology in place that makes this alignment nearly fool proof. Now, all that is necessary to prevent cardan shaft joint wear is the right contractor, with the correct equipment. With this, precision cardan shaft alignment can fit any maintenance budget, and prevent headaches of catastrophic failures and premature machinery replacements.

From Security to Efficiency
Modern Vessel Tracking

BY NICK FARRELL

More so than many other fields of business, the maritime industry is focused on cost, which in turn gives the appearance of being conservative towards technology. Of course, we have magnificently technical ships operating with equipment that wouldn't look out of place in a NASA lab, but in general, it can take decades for a technology to become mainstream. Unless it becomes mandated by the IMO. Vessel tracking is a partial exception to the rule though, with many fleet owners realizng its potential for more cost-effective operation and improved vessel and personnel security.

Knowing the exact position of all vessels in a fleet, in a software solution designed to fit with your own logistical processes, can significantly improve efficiency. If a ship arrives early or late, more often than not there will be an associated cost. If this can be identified during transit then the early or late arrival can be negated or at least planned for. Likewise, if by knowing the positions of your fleet of workboats means that you can route the closest vessel to the next job, then significant fuel cost savings can be made. With modern tracking systems, the way data is used is just as important as knowing where a vessel is at all times. But there are countless ways to apply the data to the benefit of efficiency for a single ship or fleet, so providing easy, reliable access to position reports is vital.

RockFLEET is a new tracking unit for the professional maritime environment. During its design phase, the team decided that in order for the position data it provides to be of the most use, as well as being available via Rock Seven's own fleet viewer 'The Core,' it must also be available in any software system the user chooses.

Meet RockFLEET

RockFLEET is an advanced new tracking unit for the professional maritime environment. During its design phase, the team decided that in order for the position data it provides to be of the most use, as well as being available via Rock Seven's own fleet viewer 'The Core,' it must also be available in any software system the user chooses. Using a standards-based API, the customer can integrate tracking data from RockFLEET into their own applications. Typically this means that RockFLEET tracked assets can be added to existing fleet management software, which invariably is designed around an owner or operators own logistics.

With accurate vessel location data available, the opportunities are endless and only down to the creativity of the user. For instance, a current Rock Seven customer uses location data to manage payroll of personnel.

Essentially, personnel get paid different amounts depending on whether the ship is at sea, in international waters, in port or transiting regions with high piracy incidents.

Tracking Without Ship's Power

The above user is a private security company involved in anti-piracy operations. It actually gets location data using RockSTAR, the handheld version of RockFLEET, which is a new fixed unit that can be fitted anywhere on board. Completely waterproof and with no moving parts, it is a robust, ultra-compact (13cm diameter / 4cm high) device with multiple mounting options. The physical design of RockFLEET was in part driven by the security challenges faced by vessels facing the issues of modern piracy.

The unit itself is designed to look anonymous; as standard there's no name on the outside. It works from ship's power, but it uniquely has a backup battery inside. Which is important should a vessel be hijacked and the main power cut.

Knowing the location of all friendly vessels in a region is vital to organisations with a stake in ensuring safe passage through known piracy hotspots. With an operational vessel/fleet tracking system, ship owners and fleet managers will know where their ships are at all times. This information can be fed to authorities, private anti-piracy companies and the naval forces patrolling piracy hotspots to build a clear, near real-time picture for domain awareness. The value of this information should a vessel be hijacked is obvious; knowing the last whereabouts of a vessel provides responders with a starting point should a hijacked vessel's tracking system be disabled by pirates.

Today's pirates know that many commercial vessels are tracked, especially those would be targets sailing in what are known to be hostile waters. So disabling vessel tracking equipment on board is a sensible action for said pirates after a hijacked ship's crew have been subdued and because most tracking units are powered by the vessel, finding and cutting the power supply isn't hard. RockFLEET however, is the only device of its kind with an internal battery backup, so can continue to transmit position for up to two weeks if external power is cut.

With facility to mount covertly, this makes it especially suitable for vessels traversing piracy hotspots.

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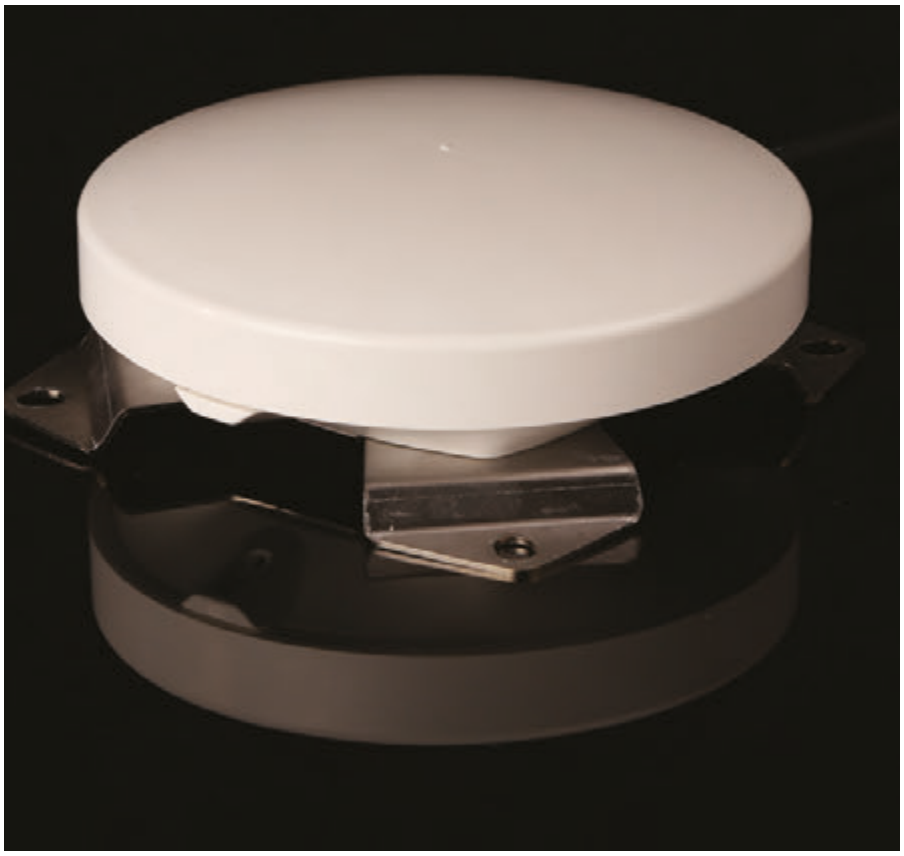
Leveraging the Link

Understanding the cost conscious attitude in the maritime industry, it's important to provide added value to persuade ship owners of the financial viability of ship tracking. RockFLEET operates on the Iridium network, specifically using the 'Short Data Burst' (SBD) capability. This enables pole-to-pole global coverage on a Pay As You Go basis. With no annual contract required, the user only pays for the months the system is in use and pre-purchases credits for transmitting tracking positions. An optional module enables RockFLEET to switch automatically to GSM services when in range, providing further cost savings.

The system obtains a position using the GPS satellite network and then transmits that position at user-defined intervals. A single location transmission uses a single pre-paid credit, making the RockFLEET approach to tracking extremely cost-effective. Tracking data is viewed on the Rock Seven fleet management platform, The CORE, or as described above, on the user's own fleet management system. If a user doesn't not have their own internal system, The CORE fleet management platform provides a secure, user friendly web-based tracking service that will support security and logistics world-wide.

Further value can be gained from utilizing the Iridium network for 'Machine 2 Machine' (M2M) applications. RockFLEET has a wired (serial) API which means it can be controlled by other systems that may transmit data via Iridium. For example, existing telemetry systems on a vessel that usually collect and send environmental data via terrestrial networks or other, more expensive satellite networks, can easily be expanded to transmit from anywhere in the world via the RockFLEET unit, at the same cost per transmission as a simple location message.



RockFLEET operates on the Iridium network, specifically using the 'Short Data Burst' (SBD) capability. This enables pole-to-pole global coverage on a Pay As You Go basis.

This can be useful to receive fuel consumption data from engine management systems or maintenance alerts from other equipment on board, in a very cost effective manner. Much like the RockFLEET approach to how position data is integrated with proprietary software solutions, this M2M data capability has practically endless applications, only limited by the creativity of the user.

Crew Welfare was also a design consideration with RockFLEET. As well as the wired serial API, it features a wireless Bluetooth LE API, which allows mobile apps to send and receive their own data via Iridium.

At present, the Rock Seven Connect app uses this feature for crew messaging but it could be used i.e. for weather routing and navigational warning information.

The Author

Nick Farrell is Director of Rock Seven, a UK based developer of Iridium tracking system for maritime, land and aeronautical users.

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Marine Insurance & the "Human Factor"

BY BRIAN BRATAGER, SECOND VICE PRESIDENT, TRAVELERS OCEAN MARINE

Insurance underwriters of diversified maritime exposures see a wide variety of approaches taken by vessel operators to manage human error to control risk. They have found through experience that the majority of hull and liability claims can be traced to a breakdown in preparedness and decision-making. Maritime operators that set a high bar and build well-constructed methods of managing the human element of risk – and those that monitor it closely – can save significantly on insurance costs due to lower frequency and severity of claim activity.

Managing the human factor is the most difficult of all risk management processes. We are all fallible and prone to error. It is often easier and more tangible to focus on risk management priorities, ranging from equipment maintenance and improvements to physical assets. Compared to the benefits of fleet management, the time and money spent on promoting a culture of safety, improving emergency preparedness and creating a thorough training approach to operational procedures and incident management might be viewed as less impactful. However, real world experience tells us otherwise. Operators who understand the human factor and focus on practices aimed at building a culture of safety are ultimately the ones who control risk and insurance costs most effectively.

Underwriters typically see some common recurring themes in operations that have built and continue to improve upon best practices in human factor management. The areas identified below are representative of observed practices of some of the best operators in class – operators who have successfully managed human element risk and have benefited in the form of reducing claims and insurance costs.

Best-in-Class Practices

All best-in-class practices are interrelated to some extent, but begin with personnel recruitment. Identifying and retaining crew is one of the more expensive and time-consuming aspects of any type of vessel operation – and a process that all companies would prefer to repeat as infrequently as possible. In today's environment, there is fierce competition for both licensed and unlicensed crewmembers. Vessel operators who are able to recruit good crewmembers and manage them within well-designed programs can reduce their exposures and also improve retention of their most valued employees. While each individual operator determines the particulars of salary, rotation and benefits, it is not just a matter of paying enough or offering the best benefits. There are other traits that are commonly found to be present in most superior operations.

Key Programs and Considerations

Above all else, great operators maintain a relentless focus on one key issue: safety. Building a culture based on safety is a substantial commitment. It requires much more than distributing pamphlets and paperwork. In a perfect world, all commercial and passenger vessels would have state-of-the-art safety and risk control programs that begin with hiring practices and never really end – because safety innovations are constant. Operators who promote a culture of safety tend to follow these basic principles:

- Demonstrate consistent management support for and engagement with each vessel's captain and crew.
- Establish and carry out routine communications and meetings with captains and crew to maintain a current understanding of vessel and crew condition.
- Provide incentives to captains and crew to be active participants in the

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company's safety culture.

- Establish, monitor and regularly update a formal, written safety program.

- Evaluate crew competencies regularly, including licensing, credentials, medical fitness and supervision procedures for lesser experienced crew.

- Construct thorough operations manuals that clearly define roles aboard the vessels, establish procedures and checklists, and manage record retention and internal review processes.

- Create and follow through on a formal vessel maintenance program with established intervals and record-keeping.

- Stay abreast of evolving trends to understand what contributes to marine accidents.

- Run periodic drills and simulations to prepare for worst-case scenarios.

Building a Safety Management System

Safety Management System (SMS) is a term that refers to a comprehensive business management system designed to manage safety elements in the workplace. It is an effort to reduce risk to a level that is as low as is reasonably practicable. A safety management system can be created to fit any business type, size and/or industry sector. Ideally, a safety management system woven into the fabric of companies large or small will become part of the culture.

There are three broad components of an SMS – ethical, legal and financial. A clear obligation is placed on an employer from an ethical standpoint to ensure that work activities and the workplace are safe. Legally, there are ample regulations and legislative requirements that define how this is achieved and measured. Research shows that effective safety management can reduce the financial exposure of organizations by reducing direct and indirect costs associated with accidents. In addressing these three components, effective SMS models generally contain the following elements:

- A clear definition of how the organization is structured to manage risk.

- Identification of workplace risks and accompanying controls.

- An effective plan for communicating across all levels of the organization.

- Checkpoints to identify and correct non-conformities with the plan.

- A commitment to continuous process improvement – regularly monitoring and adjusting.

The Way Forward

Improving safety and reducing the margin of error in human factors can yield significant benefits to all vessel operators. The International Maritime Organization, whose primary purpose is to develop and maintain a comprehensive regulatory framework for shipping, states in its preamble: "The cornerstone of good safety management is commitment from the top. In matters of safety and pollution prevention, it is the commitment, competence, attitudes and motivation of individuals at all levels that determines the end result." It is clear that efforts to improve safety bear significant results. It is never too late to establish or refresh strong programs that can prevent incidents. The process might seem daunting, but there are resources available to assist in all of these efforts.

Resources – You're Not Alone

Most operators are already familiar with formal safety and operational programs through requirements set by regulatory agencies, auditors and safety management systems. If vessel operators are not familiar or only beginning to make their operations more formal, however, there are multiple resources available that can be consulted, including:

- The United States Coast Guard has created multiple centers of expertise – towing, cruise, LNG – all staffed by individuals who can be contacted to answer any regulatory questions or otherwise offer guidance. This complements their efforts at the local and national level.

- The American Waterways Operators (AWO) Responsible Carrier Program has multiple best practices for towing vessels, barges, etc., that are applicable at almost every level of operation.

- The Passenger Vessel Association functions much as the AWO, except it is tailored for passenger vessels. Membership within the association will grant access to publications, procedures, checklists, etc., many of which would be considered "best practices."

- Your insurance provider's risk control specialists will work with you to get ahead of issues before losses occur and will work with your management and staff in customizing solutions.

There are many resources available to vessel operators or owners seeking to improve their overall operations, not just those mentioned above. While the initial process can be challenging, installing a formal safety management system will improve the ease and effectiveness of management.

The Bottom Line

An organization that has built a great culture based on safety and preparedness also builds great momentum in all aspects of its operations – including recruiting and retaining the best employees. From an underwriter's perspective, companies that build and regularly monitor and update effective and comprehensive safety programs benefit from lower frequency and severity of insurance claim activity. Be sure to work closely with your insurance broker, your underwriters and their marine risk control specialists in designing your plan. As your results develop, be sure to communicate your success – underwriters who are properly tuned-in often respond favorably with competitive insurance programs.

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Subsea Defense & the Changing Paradigm of Submarine Programs

Technology and dynamic mission profiles have driven change in the defense industry, Hydro Group Plc Managing Director Doug Whyte, explores the changing paradigm of submarine programs, an evolving market he has experienced first-hand, with over 30 years at the helm of his own innovative subsea design and manufacturing group.

About the Author: Doug Whyte, Hydro Group Plc Managing Director

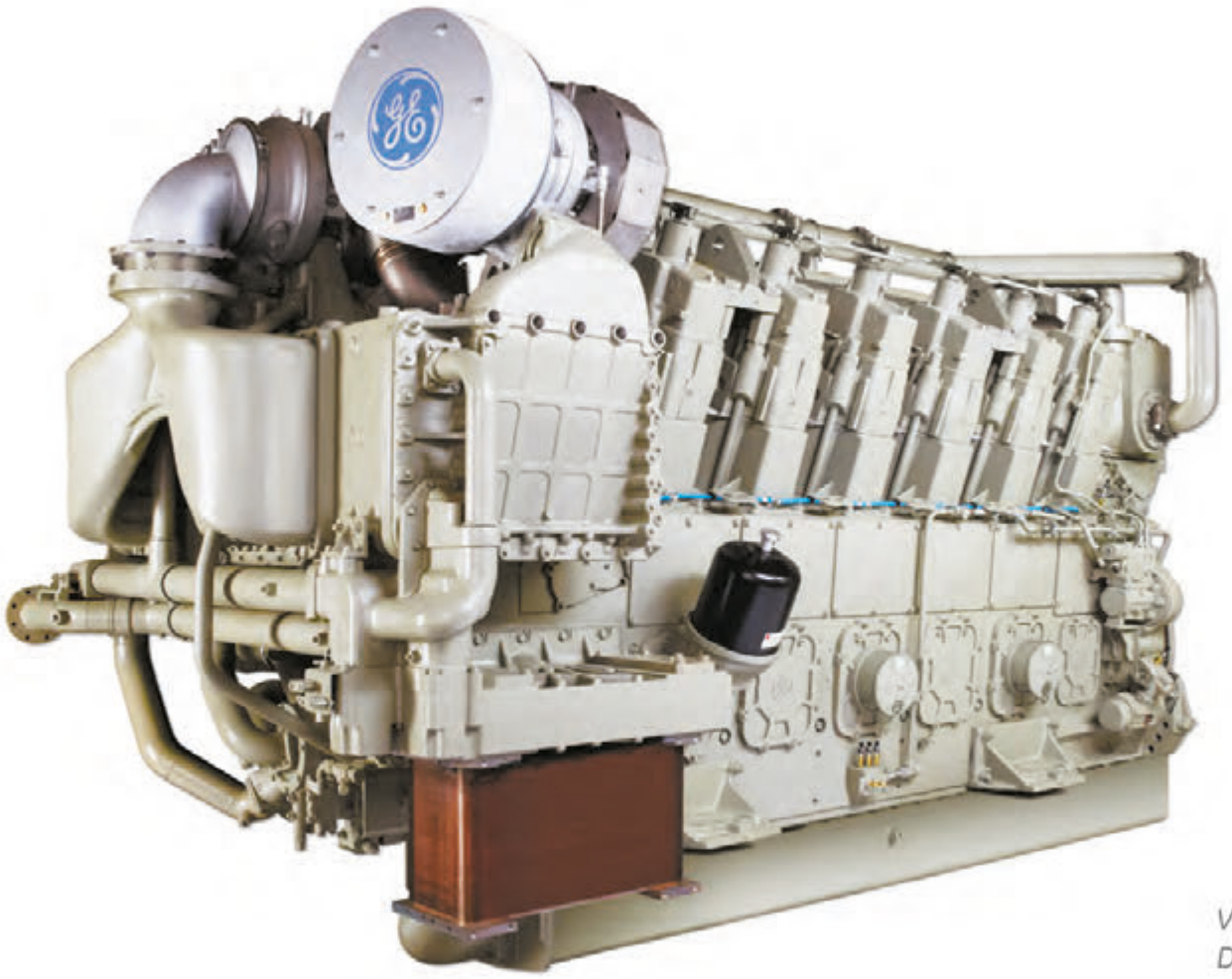
My original business partner, Mike Redstone, previously worked for Vickers Slingsby which was involved quite extensively with the Ministry of Defense (M.O.D.). At that time, in the late seventies, close involvement with the M.O.D. was commonplace. In addition to central office, located at Abbey Wood, our main contact offices were Bath and D.E.R.A. at Portland – now all gone. The first submarine contract with which we were involved was the Vanguard Class SSBN which deployed the 16 Trident D5 missile system and it began trials in 1992. Hydro Bond Engineering and Hydro Cable Systems were involved with outboard cable and connector systems for the onboard degaussing units, following on with similar projects for its sister boats Victorious, Vigilant and Vengeance.

The modus operandi for UK submarines during the cold war was to run silent, run deep and to capture signal, noise and signature data from the enemy known as the "Take" and, of course, to deliver a nuclear strike from their unknown position somewhere near to Russia. The UK was ahead of its field in sonars, so most submarine platforms had cable and connector systems fitted.

Sonar development has moved on at considerable pace and comprises more highly technical equipment, external to the hull, which requires cables and connectors that feed through the hull to the heart and operations of the boat. An example is periscopes, which are referred to as masts, which penetrated the hull of the submarine. Watch the old black and white war movies – when the Commander shouts "Up periscope!" and half of the Atlantic comes rushing in! Now, with advanced technology, the mast is external to the hull and all of the data and communications are fed via cables and connectors using fiber optics, which is Hydro Group's area of expertise. Today, mine counter measures, (MCMs) towed arrays, active and passive sonars and anti-surface ship missiles are necessary requirements of the new construction for modernization of current submarines in service, such as the UK's Astute fleet.

The Astute Class Submarine is currently the most advanced and powerful attack submarine ever operated by the Royal Navy at over 7500 tonnes submerged, capable of speeds more than 30 knots, powered by Rolls Royce PWR2 reactors. The duration range for deployment is only limited by the amount of food on board so it can stay at sea for months at a time. It is armed with land attack missiles and Spearfish torpedoes. Its sonar system 2076 is the world's most advanced and is fitted with Hydro Group's cables and connectors.

Bearing in mind the cost of the nuclear defense program, controversial as it is, the construction of a nuclear submarine



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The Successor Submarine replaces the current Astute submarine fleet. It will carry the U.K.'s strategic nuclear deterrent. According to Naval Forces, Successor will be the largest and most advanced submerged platforms operated by the Royal Navy and the design and construction will be the most technologically complex in the history of the U.K.

is in the billions and the support services and duties around the world is in the millions. Submarines are continually being built to larger specifications (tonnage) and this is true for all counties around the globe which build them. So, it's essential that the equipment installed is designed, tested, and qualified to last its lifetime to ensure the boat's security and the men who work on it.

Hydro Group is involved in subsea engineering in the oil & gas and renewable energy industries and provides similar solutions and designed products which have synergy with those we produce for the defense industry. Our innovation is focused on the longevity of product where the installation has a life cycle requirement of 40 years.

Evolving technology and dynamic mission profiles have driven change in the industry. Underwater sensor and propulsion innovation have enabled extended subsea endurance and has broadened the operational scope of today's submarines. Mission profiles now include intelligence, surveillance and reconnaissance operations (ISR) and for the deployment of Special Forces on covert missions in hostile territory. The versatility of submarine operations is constantly adapting to meet the different types of global threat.

Many other nations are looking to modernize their own fleet of submarines and a shift in procurement patterns is stimulating collaboration and consolidation in the market. The Asia Pacific region is one such significant growth area for the submarine market. The jostling for power amidst a growing sense of hostility is fueling an arms race in the region and driving the need for submarine protection. Territorial disputes between counties are increasing and they are all primarily dependent upon maritime routes. South Korea is embarking on an indigenous program of submarine construction and, due to its commercial acumen of driving down costs, will also give the country a platform to sell and build boats to other countries.

Asia is expected to impact significantly on the submarine market over the next several years, with an estimated expenditure of $46 billion dollars, a figure matched by the whole of Europe on its submarine building programs. Currently the global market is dominated by America with 46% of all build, followed by Europe with 25%, Asia with 24% and Latin America with 5%. The Asia Pacific region has recovered from the global economic slowdown which is encouraging spending on defence and in particular submarines.

Hydro Group addresses diverse and in some cases rapidly changing markets, albeit the submarine programs move at a slower pace, the technological innovation developed is long term in its planning and well in advance of future implementation. In order to keep pace with demand we work closely with our customers to understand their technology and business needs to engage at an early stage of the product design cycle. Cooperation in the design of solutions allows us to gain invaluable insight into the functional objectives and to address

any specific technology opportunities. This minimizes product realization timescales.

Replacing the current Astute submarine fleet will be Successor, which will carry the U.K.'s strategic nuclear deterrent. According to Naval Forces, Successor will be the largest and most advanced submerged platforms operated by the Royal Navy and the design and construction will be the most technologically complex in the history of the U.K.

Successor will be built and equipped by BAE Systems. Hydro Group has been selected to design, develop and qualify a range of connectorized through-hull penetrators on the submarine fleet, which has been acknowledged by BAE as offering a highly innovative and cost effective penetrator solution to take the Successor fleet into the next decade. The project will engage a dedicated team of Hydro Group's engineers and the new technology requirements dove-tail with the Group's current extensive R & D program.

The design and development of the new range of through-hull penetrators will be subjected to a process vigorously controlled by extremely onerous standards and testing procedures with a demanding set of electrical power and signal, radio frequency and optical requirements. The design must guarantee a cast iron capability for the system to perform its mechanical function in harsh or hazardous environments and to ensure that this can be achieved without limiting the electrical or optical performance.

A core aspect of the innovation for the new through-hull penetrators is the migration of inserts from Hydro Group's existing range of submarine dry mate connectors (SDMs), originally developed for the Astute Program.

The complimentary requirements of the subsea energy, defense, scientific and offshore renewables markets provide scope for Hydro Group to adopt and adapt appropriate processes that enhance the solutions and service provided to all subsea markets. Technological solutions for the Successor fleet will undoubtedly advance innovative research and development in other industries.

Continuous investment in our equipment, processes and facilities, together with our commitment to training and staff development all contribute to flexible and adaptable support to our customers and to providing active participation in a number of collaborative programs with them and other consortiums.

Technological advancement of submarines will continue to provide a business opportunity for Hydro Group, strategically focussed on the U.K.'s defense capability, and long term, around the globe.

The Author

Doug Whyte is Managing Director of Hydro Group plc, an innovative subsea design and manufacturing group, incorporating Hydro Bond Engineering and Hydro Cable Systems Ltd. The Hydro Group team apply their extensive knowledge and capabilities in materials and applications, developed over 30 years, to provide market leading design and manufacturer of underwater cables and connectors for subsea, underwater, topside and onshore applications. The company is a major global supplier of harsh environment engineered products to the offshore oil and gas, defence, oceanographic, renewable energies, diving and ROV/AUV markets.

ZF Geared up for a Commerical Maritime Push

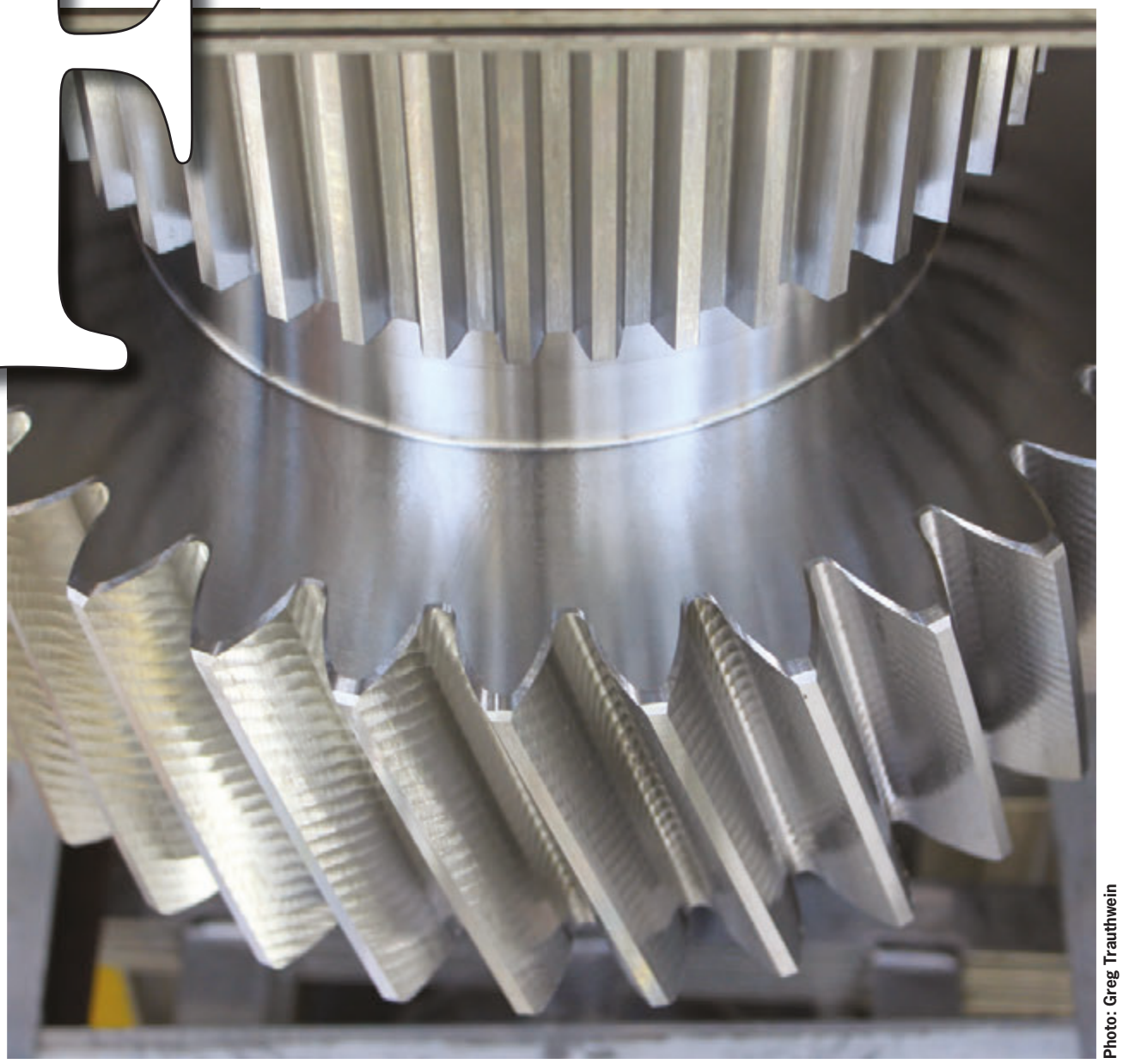


Photo: Greg Trauthwein

A walk through the ZF Friedrichshafen AG marine propulsion system manufacturing plant in southern Germany does nothing but confirm the commonly held perceptions of German engineering prowess: the facility is clean to a fault; the equipment is modern and well-maintained; the employees are orderly and efficient. While the ZF marine propulsion systems business – which generated a turnover of $336 million in 2013 – is but a sliver of the company's overall 2013 sales of $22.4 billion, make no mistake that this unit is of keen interest for the company as it continues to increase its penetration in the global commercial marine sector. On the eve of the company's 100th anniversary celebration in 2015, Andre Körner, Head of Production Commercial & Fast Craft, ZF Friedrichshafen AG, shared insights on the path ahead.

By Greg Trauthwein

Andre Körner gets the big picture.

As the head of ZF marine propulsion commercial and fast craft business, he overseas both the "bread-and-butter" business – ZF's dominance of the global yacht market, an approximate three-quarters market share which commands about one-third of the company's transmission production; as well as the high growth ends of the business in the commercial workboat sector, including the production of heavy duty workboat transmissions in Padua, Italy, and the production of Z-Drives in Krimpen, The Netherlands, the latter a feature focus in the August 2014 edition of *Maritime Reporter & Engineering News* which chronicled the company's strong push in the North American towboat sector.

Körner joined ZF just more than a year ago, and a part of the draw was the fact that it is a large, private company, which he said delivers a certain degree of freedom in mid- and long-term product line planning that a similarly sized public company, driven by shareholder demands, may not be able to stomach.

"We are living in an environment where we have more mid- and long-term vision on the business than on shareholder value driven companies because they have to show performance year after year," Körner said. "Don't get me wrong: we are not living in some kind of a paradise where nobody is questioning us on performance and operating result. But I believe we (as a privately held company) have more medium and long-term vision which, especially in the marine environment, is key to long-term success."

The new ZF W10000 transmission, a new generation transmission for the Offshore and Tugboat markets, available with ratios from 2.0 to 7.9:1.

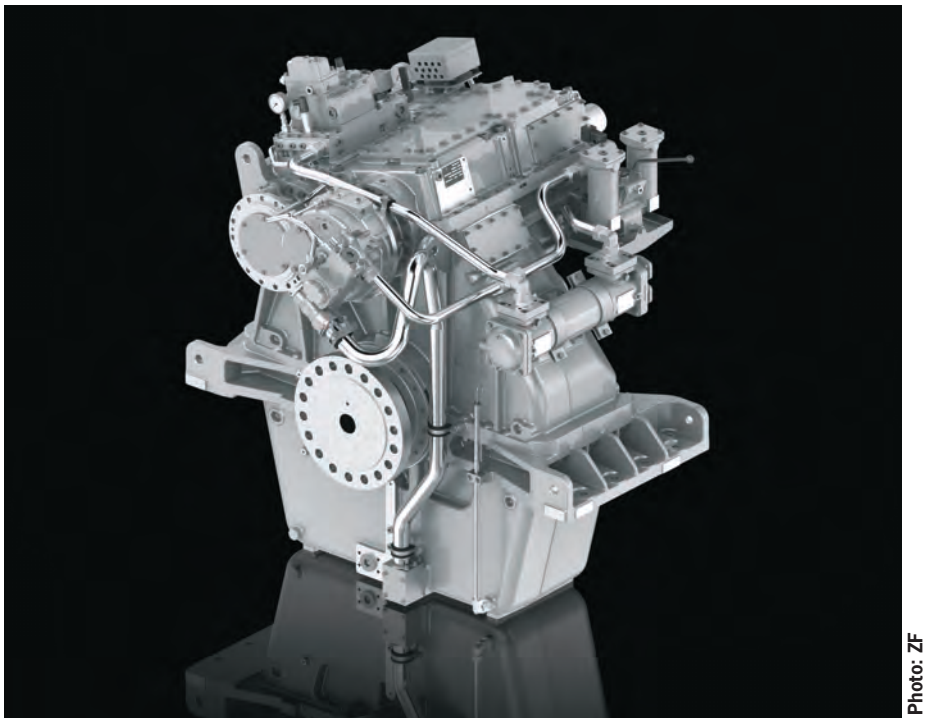


Photo: ZF

Digging into the Workboat Sector

Generally stated, the current marine market perception is that ZF is well known for fast craft and yacht transmissions. Körner said that ZF today has only a small share in the workboat transmission sector, meaning that it has plenty of room to grow. It recently introduced the "Tough Gear" brand name, which is simply the surface manifestation of its drive to further penetrate the global workboat markets. But the Tough Gear name is much more than skin deep. ZF's drive into the workboat sector is backed by finance, focus, leadership will and engineering firepower to drive this growth.

The latest member of the Tough Gear brand was unveiled at SMM when ZF introduced the new workboat transmission family – ZF W 10000. The new

Photo: Greg Trauthwein

"We know how to build gears, and these (Tough Gears) are really on the highest standard in terms of material, production processes and design. Today we have a wide, modern portfolio in this (workboat) area. This should be a signal into the market: We are here; we have this portfolio, and it's a good product. In fact it is a really good product."

Andre Körner, Head of Production Commericial & Fast Craft, ZF Friedrichshafen AG

Photo: Greg Trauthwein

As a private entity, ZF is not beholden to making financial decisions based on shareholder demand. Thus the investment in R&D is significant, and quality control starts on the factory floor, the the latest equipment to properly run the products through their paces.

Photo: Greg Trauthwein

family is designed specifically for the commercial craft segment. “We spent a lot of time talking to the market, but more importantly, listening to the market,” said Körner. “And the W10000 is the direct result of market feedback.”

The W10000 is rated to 2,610 kW (3,500 hp) at 2,100 rpm, and its compact design increases power density compared to the current offerings. The W10000 represents a transmission family of a new generation based on a standardized platform for component sharing, which aims to reduce the complexity while increasing service parts availability across product families.

The new transmission is available at launch with ratios from 2.0:1 up to 7.9:1. “Our customers are requesting deeper ratios and the W10000 delivers,” Körner said.

The transmission can be ordered in reversing, non-reversing and hybrid-ready (PTI) versions. W10000 transmissions also incorporate an integrated shaft brake, a 1,000kW (1,340hp) Top PTO, and has many accessories including ZF Autotroll available for various applications and vessels with dynamic positioning requirements.

“We know how to build gears, and these (Tough Gears) are really on the highest standard in terms of material, production processes and design. Today we have a wide, modern portfolio in this (workboat) area,” said Körner. “This should be a signal into the market: We are here; we have this portfolio, and it’s a good product. In fact it is a really good product.”

Industry Insights

While ZF leans heavily on its pedigree and manufacturing process, it does not create its products and systems and a vacuum, rather it relies on close ties with both the end user, the boat builders and the engine manufacturers to help it analyze future market trends.

“We conducted intensive market studies as we looked to define our future strategy,” said Martin Meissner, Marketing and Communications Manager for North America, Industrial Technology division, ZF Group. “We ask questions: ‘Where’s the market going … but more specifically, where is the market going with relation to power? And how do we make sure that the products that we have meet those future needs? So, if we’re talking about engine manufacturers for example, it is crucial to know where they are going with their next versions of product, so that we can make sure that the transmissions that we build are application-ready for them.”

To its very core, the engineering process is an ever-evolving entity, and in ZF Marine’s world this means balancing the benefits of delivering a “gear family” with its standardized manufacturing and common parts, while incorporating individual customer wants and needs.

“We have a lot of discussions with potential customers on a deep technical base,” Körner said. “And those discussion lead to custom requests, such as the placement of the cooler, the addition of a sensor, and so on. We really discuss with people what they want, and what we can do to make their lives easier. But at the same time without spoiling our family concept and our modularity.”

“And we can really play on our global service network,” said Meissner. “This is one of our true strengths; when we are in a market, we are there to support you. So as we roll out our new products and really push the new Tough Gear brand, we will emphasize that ‘we are where you are.”

Run until Fail vs. Preventative Maintenance

Key to the success of the gear product of course extends far beyond the manufacturing floor, and Körner stressed the importance of service after sales as an important plank in the platform to increase market share in the world’s demand workboat and government markets. Common parts across different types of transmissions is a good example, as it not only makes the production process more reliable and efficient, it also makes the ability to stock and deliver parts globally, when and where needed, more efficient.

“Up-time (in the commercial market) is most important, because it is money,” said Körner. “It is money every time, every hour, every day the boat is out of operation. And the economic pressure on owners has grown over the years. So there’s pressure for us too, because if you have problem with the transmission and you can’t run your boat, we have to serve these customers as fast as possible to provide spares, to provide technicians and to get this boat back into service.”

In tandem with an increased focus on maintenance is an increased focus on individual parts of the system such as the transmission. “Maybe 10 or 20 ago, when and owner of a vessel thought maintenance, they were mainly thinking of the engines,” Körner said. “But I believe

(Continued on page 57)

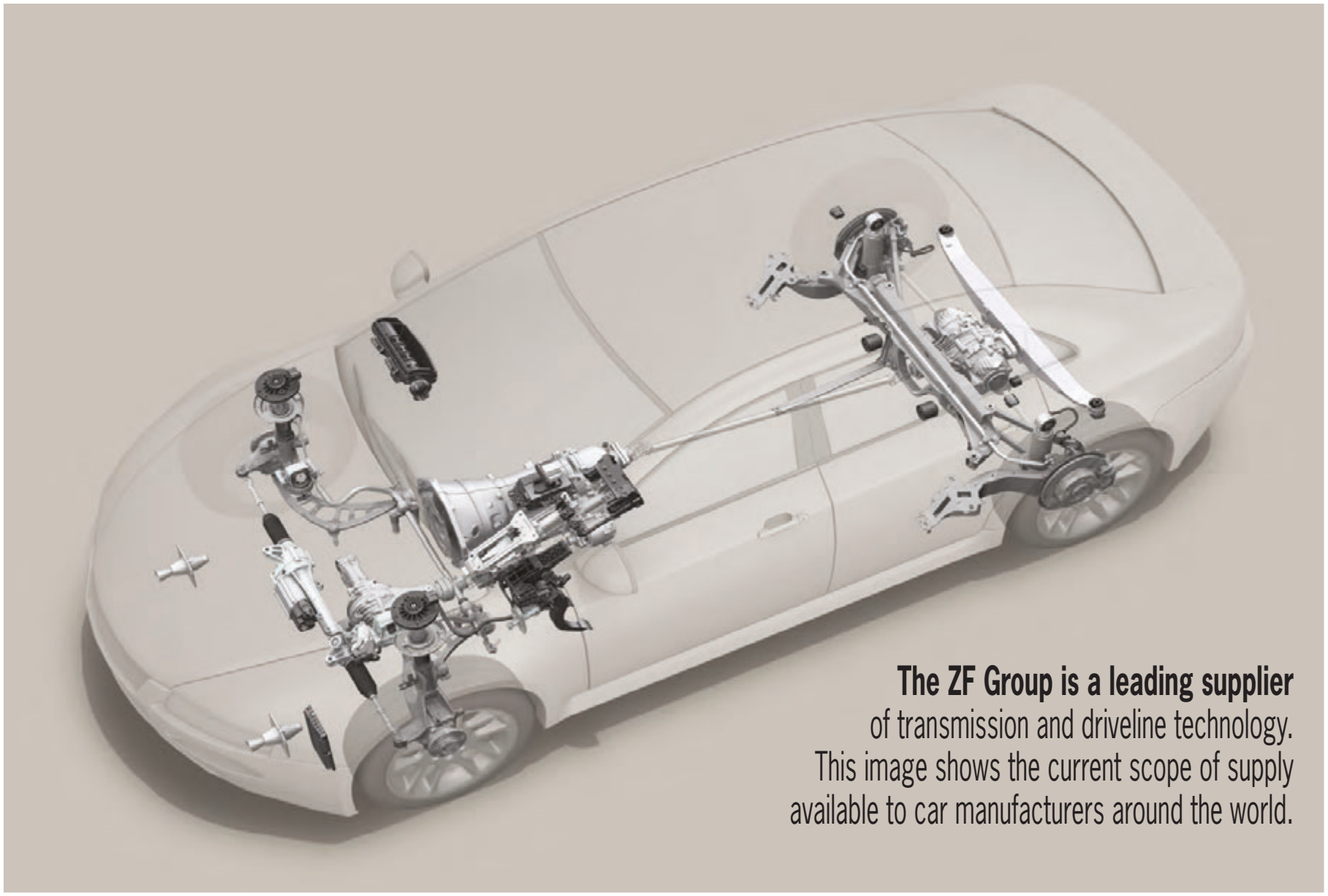
Lessons from Automotive Applied to Marine

ZF Group's expanse of operation includes a majority stake in automotive transmissions and driveline systems, which offer some cutting edge technologies that could someday, in some way, prove compelling in the marine market. For example, ZF now offers GPS based transmission technology. Martin Meissner, Marketing and Communications Manager for North America, Industrial Technology division, ZF Group, explains. "The car knows where it is in the world, what road it's on, the gradient of the road and upcoming curves, for example. We offer products where if you are on a windy, hilly road with an automatic transmission from ZF, and you're coming up to a corner for example, the transmission's not going to change gears because it knows that you're going to be off the gas through the corner, and then back on the gas. It is going to wait to shift until you're through the corner. Or when you are coming up to a hill, it's will drop a gear down in anticipation that you are going to be climbing the hill. So now you've got other divisions of ZF advancing that technology in the automotive, heavy truck and bus sector, and the door is open for technology share. So when we see examp=les of next generation technology solutions, we can go to these other divisions and say, 'Show us this technology, because we think we have an opportunity to adapt it to the marine market.'"

And as conservative as the marine market has traditionally been, it is not averse to technology change if improved efficiency, reduced downtime and lower operating costs can be proven.

American Commercial Lines (ACL) has proven this, as it is becoming a leader on the inland waterways incorporating Z-Drives, starting earlier this year when it took delivery of The American Way in February 2014. "Two boats have been received (American Way and American Spirit), two are under construction and four are on order," said an ACL company spokesperson. "All eight boats are 2,000 HP with ZF 5000 units."

In making the decision to add Z-Drive boats to the ACL fleet, the company cited improved performance, reduced operating costs, replacement of older boats and the addition of boats for business growth as the primary factors. At the same time, the company weighed the drawbacks, which it says includes the initial cost for spare parts, limited service coverage due to the technology being new, and additional training needs. While the jury is still out on the long-term cost benefits of the Z-Drive boats, early results are promising. "Analysis shows a ~20% improvement in fuel burn or performance when ran hard," said an ACL company spokesperson. "It remains unclear whether Z-drive boats are more cost efficient than conventional drive boats with regard to maintaining the Z drive unit vs. shafts, gearbox, wheels and rudders. Time will tell."



The ZF Group is a leading supplier of transmission and driveline technology. This image shows the current scope of supply available to car manufacturers around the world.

Image: ZF

(Continued from page 55)

most companies today realize that it's not only engines. You have to look at all of the systems, including the transmissions, to keep your boat running and to keep it operational."

According to Körner the change in attitudes on maintenance is palpable, and the days of running until failure is becoming the exception rather than the rule. Managed maintenance is the trend, particularly with the big operators, as they seek the path of regular investment in the name of operational continuity.

"So today they are really looking and saying, 'Okay, the recommendation of the manufacturer is to change the bearing after 40,000 hours; so they change the bearing, even if it still looks OK, because they want to be sure that they have the next 40,000 hours operation without problems."

Meissner contends that preventative maintenance versus 'run until fail' is an effective means to positively impact the bottom line. "When you have a failure, that boat could be 700 miles from your facility; Now it's broken 700 miles away," Meissner said.

"But if you schedule your preventative maintenance overhaul, you can bring the boat in during a down time in your business, do the maintenance at your facility where all of the parts, or maybe a swing gear is on-hand, and this helps to make it a more manageable and cost efficient operation" rather than waiting for an emergency repair.

Government Markets

In addition to the yacht, pleasure boat and workboat business, ZF has a large and vibrant government and navy business, with several cornerstone contracts including the U.S. Coast Guard's FRC project, and the U.S. Navy's JHSV project. Government and Navy work require a different level of solution, as Körner explains. "(On the government of the business) you have to of course meet the requirements from the navies and from the boat builders, specifically the military specifications in regards to shock and vibration, for example. But besides the product itself, you provide services such as manuals, spare parts list in a special forms, electronic repair instructions, and these kind of things. The service around the transmission itself is more demanding than you have today in a commercial business. So this is an ongoing investment, and one that we are happy to make."

And today coast guard and navy business is booming, and not just in the U.S. In the Far East it is booming as tensions in the China Sea area have resulted in a huge number of boats being built for and in the region. Asia Pacific, India and the Middle East markets are all running strong. Demands to this market niche are similar to the yacht business in the demand for light, strong, quiet and reliable transmissions. Demand for service, training and spares has never been higher. The U.S. Coast Guard FRC boats are a great example, as the Coast Guard said "We don't just want supply of a product, we want support from ZF with our crews that are being brought on each boat as part of the commissioning process," said Körner. "So the crews come to the ZF facility in Miramar, FL for a weeklong training course on basics of transmission technology, theory and first level diagnostics."

Five Minutes with Matthew

PAXTON

President, Shipbuilders Council Of America

Photo: SCA

The U.S. commercial maritime industry is enjoying its most robust period in a generation, with a spate of newbuild activities spurred largely by a resurgent energy production market in the U.S. as well as new rules of vessel emissions which has forced owner to invest in new tonnage. For insight and perspective on the market Maritime Reporter & Engineering News *visits with* ***Matthew Paxton****, who was selected to be the President of the Shipbuilders Council of America in 2007. In this capacity he advocates for a robust and expanding U.S. shipyard industrial base.*

By Greg Trauthwein

"The domestic shale oil and gas boom has really had a positive impact on our industry. Currently, including options, 22 large product carriers are on order (including options) to meet rising domestic maritime transportation demands."

To start off, in your view what is the current "State of the Shipbuilding & Ship Repair" business in the United States?

On the government side, funding for new construction ships is always a challenge and we could always use more. Shipbuilding programs that are under serial production, such as Virginia-class submarines and USCG Fast-Response Cutters, are providing stable and predictable work for yards and their suppliers. Ship depot maintenance is funded at 100 percent, keeping our repair yards busy. On the commercial front, the shipyard industry is experiencing a boom not witnessed in decades. In addition to a regular stream of patrol craft, fire boats, ferries and tugs, we have seen an uptick in barge construction, large complex supply boats, large petroleum carriers and the recapitalization of the non-contiguous containership fleet.

From your perspective what is the status of the U.S. ship yard sector today as compared to any other time in your career?

When you look at the industry overall, I think we are in good shape, particularly on the commercial side with all the recent new building of large vessels and uptick in barge construction. The defense side has its budget issues, particularly with sequestration which is still the law of the land. Some of that large vessel commercial new construction, however, is helping to maintain workloads, supporting both a shared skilled workforce and supplier base, for shipyards that have traditionally built for the government. This is one example of why the U.S. Navy is a strong supporter of the Jones Act.

Political support, or more accurately lack thereof, of the entire maritime sector in the U.S. is regular fodder for conversation and comment. Please give our readers the birds-eye view on

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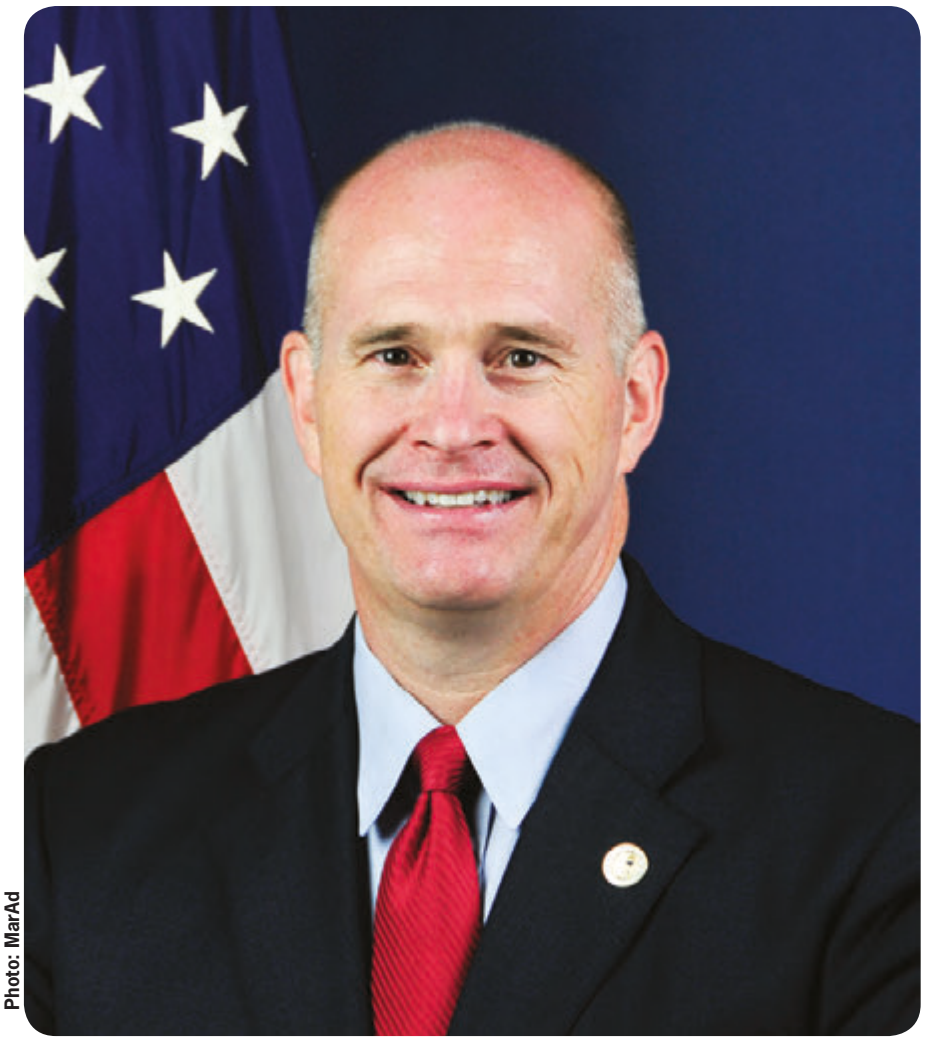

Photo: MarAd

"On the administration side, **Maritime Administrator Chip Jaenichen** has been a breath of fresh air, and is doing a lot to increase the visibility of maritime within the Department of Transportation."

Matthew Paxton

Washington and its support of the ship construction and repair sector today.

Actually, I think today we have strong support from Congress. When we lost longtime maritime champions years ago such as Sen. Daniel Inouye, Sen. Ted Stevens, Congressmen Ike Skelton and Jim Oberstar, there was a void that needed to be filled. Many Members have stepped up, including members like Sen. Mary Landrieu, who hold important assignments such as chair of the Energy and Natural Resource Committee and on the Appropriations Committee. On the House side Congressmen Rob Wittman and Joe Courtney have led an active and vocal shipbuilding caucus, and Congressmen Duncan Hunter and John Garamendi have been strong proponents of a national maritime strategy. On the administration side, Maritime Administrator Chip Jaenichen has been a breath of fresh air, and is doing a lot to increase the visibility of maritime within the Department of Transportation.

Legislatively, what is on the horizon that either gives SCA cause for hope or cause for concern in the coming year?

Certainly sequestration, which I mentioned previously, is still a major long-term issue that needs to be addressed. So too does the funding structure for the Ohio Class submarine replacement program. SCA is always encouraging support for the Jones Act, which is the foundation of the commercial world. We do not perceive any credible threats; however there are always efforts to nip at the edges of the law, which we will continue to vigorously fight. Legislatively, it looks like we're headed for another continuing resolution going into the new fiscal year. This has unfortunately become the norm of late, but it makes it very difficult for shipbuilders, repairers and suppliers of government vessels to make the most efficient plans, purchases and hires without knowing how much and when funding will become available to them.

From where you sit, on the commercial shipbuilding side of the ledger, what are the drivers for increased business today?

There are several drivers including a return to normalcy in offshore Gulf of Mexico oil and natural gas development, the domestic oil shale and gas boom, and the looming environmental regulations called emission control areas that are forcing some to recapitalize their

Photo: TOTE

The LNG Revolution has driven shipbuilding in the U.S. Here, NASSCO engineers placed the world's first dual-fuel slow speed engine into the World's First Liquefied Natural Gas (LNG) powered containership. Doosan Engine built the 8L70ME-C8.2GI under license from the designer MAN Diesel and Turbo. The engine, which weighs 539 tons is being placed in the first Marlin Class ship for TOTE.

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vessels to meet more stringent requirements. I do not want to discount, however, the many other vessels our shipyard continue to deliver, such as world class ferries, patrol and fire boats, tugs as well as many other types of vessels. Increased commercial shipbuilding is also good for government shipbuilding. Workers, skills and materials used in commercial shipbuilding translate to government work, providing more value for the taxpayer's dollar. Lastly, with the Administration's military strategy to pivot more to the pacific, this is going to require a very strong Navy and that means more vessels to meet that demands of the vast pacific

The shale oil and gas revolution has overnight changed the energy profile of the U.S. How is this affecting the ship construction business in the U.S.?

As I just mentioned, the domestic shale oil and gas boom has really had a positive impact on our industry. Currently, including options, 22 large product carriers are on order (including options) to meet rising domestic maritime transportation demands. That is a massive number, representing billions of dollars in investments, compared to a few short years ago. Additionally, tank barge construction has increased for the same reason.

The proliferation of shale gas, in particular, seemingly has had a dramatic effect on the U.S. shipping and shipbuilding sector as the U.S. has quickly emerged as an international leader in the design and construction of LNG-powered tonnage. Can you comment on the "LNG Revolution"?

This is something our industry is very proud of. Domestic shale gas is being accessed at unprecedented levels, resulting in an asset that has a great price advantage over traditional maritime fuels. Not to mention its environmental benefits. Because of this unique situation, the shipbuilding industry is really becoming a world leader in designing and now building LNG powered product carriers, containerships and offshore support vessels. We only expect more and more vessels to be built for LNG utilization, especially as landside infrastructure improves.

Looking at the coming 12 to 24 months, what does the SCA see as the biggest challenge to a prosperous and growing ship construction and repair market? Please provide details.

On the commercial front, finding the next market is always a concern. Shipyard backlogs look good for the time being, but we are already beginning to think about what the next opportunities might be – such as expanded offshore oil and gas exploration and development (currently only portions of the Gulf and Alaska waters are open); offshore wind, and potential export initiatives. On the defense side, one of the biggest challenges will be funding the replacement for the Ohio-class ballistic missile submarines. These vessels are an expensive but absolutely necessary leg of the nuclear triad and will put pressure on other shipbuilding programs without additional funding.

Going forward, what do you count as the number one initiative for SCA and its members and why?

SCA has a robust membership, with a diverse set of workloads and specialties. SCA is first and foremost about advocacy. If we had to pick one goal or initiative, it would be to increase the visibility and awareness of the critical importance our industry has to the nation's economic, national and homeland security within the halls of Congress and within the administration.

"Shipbuilding programs that are under serial production, such as **Virginia-class submarines** and USCG Fast-Response Cutters, are providing stable and predictable work for yards and their suppliers." - Matthew Paxton

(U.S. Navy photo courtesy of Huntington Ingalls Industries)

"You cannot be profitable in this industry unless you are safe.
You cannot be safe unless you train."

Morton S. Bouchard III

Bouchard Simulation Center
Opens at SUNY Maritime

Last month in New York Morton S. Bouchard, III and several local maritime and political dignitaries officially opened The Bouchard Transportation Co., Inc. Tug & Barge Simulation Center on the campus of the State University of New York (SUNY) Maritime College.

Captain Robert Glas, Vice President of Regulatory Affairs at Bouchard Transportation made the traditional ribbon cut, as Morton S. Bouchard, III, his two sons, US Congressman Joseph Crowley, RADM Michael Alfultis, USMS, Ph.D., President of SUNY Maritime and a host of industry executives and dignitaries looked on.

"The contribution is to, first and foremost educate the cadets that go to school here (SUNY Maritime), to give them a good foundation when they graduate to come and be employed in an industry that is booming and lacking qualified employees right now," said Morton S. Bouchard, III. "The way it came about was really simple: we always had a simulator in New York Harbor, and the company that was operating that simulator moved it down to Houston. So we partnered with SUNY Maritime to build a first-class simulator on campus that would not only benefit cadets, but would benefit our employees. We're going to do our training here with our captains and mates." The Bouchard Transportation Company, Inc. Tug and Barge Simulation Center is the latest in Kongsberg Polaris Bridge simulation technology, utilizing an industry-inspired bridge console arrangement, with the latest hydrodynamic ship models and exercise areas. The Center offers full mission bridge simulators, instruction stations, and a de-briefing area, where instructors can discuss topics including navigation, seamanship and bridge resource management skills required in the operation of tugs and barges.

(Photo: Greg Trauthwein)

Training on this state-of-the-art Center ensures that students enrolled at the College, and professional mariners alike, are well-educated and trained in a controlled environment. Attention will be given to the complexities of operating tugs and barges, ranging in size from 3,000 to 12,000 horsepower, which carry all types of commodities. The Center creates new opportunities and better prepares future and current professionals for successful careers in the maritime industry.

The simulation center was funded by a gift from Bouchard Transportation, the largest independently owned ocean-going petroleum barge company in the U.S. While the simulation center was funded by Bouchard, features replica simulation models of the Bouchard fleet and will serve to train and maintain Bouchard seamen, the center is a critical resource for SUNY Maritime cadets and is open for business industry companies and professionals. SUNY Maritime continues to invest in the latest simulation technologies for its students and corporate clients, and the new center will be augmented in early

2015 with a new Engine room Simulation Center and a new Liquid Cargo Handling System Simulator. As Bouchard III is a fourth generation owner of the venerable company, he put in perspective for *Maritime Reporter & Engineering News* the value of training and education in today's maritime industry.

"Training and education is 200% more today. You cannot be profitable in this industry unless you are safe," said Bouchard III. "You cannot be safe unless you train, but that's not only in the simulator, it's every day on these vessels. The captains in our company are held to the highest standards to be safe, and that is the only way that you can be profitable."

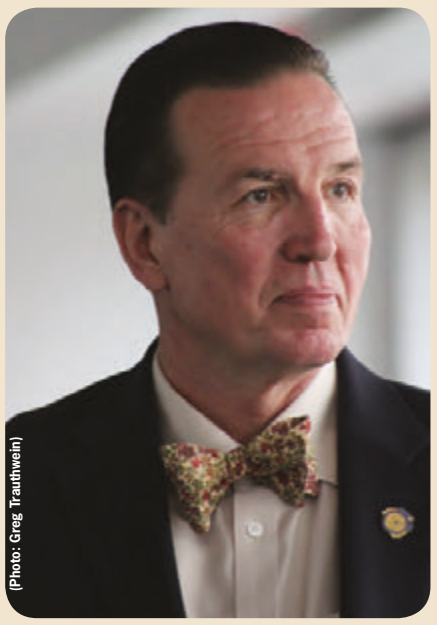
Bouchard Transportation's history dates back to its incorporation in 1918 by founder, Capt. Fred Bouchard. Bouchard is a family owned business and the company's areas of operation span all four coasts of the United States: East, Gulf, West and Great Lakes. The fleet consists of 25 barges ranging from 25,000 to 252,000 barrels and 21 tugs ranging from 3,000 to 10,000 hp.

- Greg Trauthwein

15th Annual
Towing Industry Forum

The opening of the new Simulation Center was the pinnacle event of the 15th Annual Towing Industry Forum hosted at the New Academic Building on the SUNY Maritime Campus. The Towing Industry Forum, organized for the past 15 years by Captain Eric Johansson, Vice Chairman, Professional Education & Training Department, SUNY Maritime, is an intimate event drawing just more than 100 industry executives, including many of the country's most prominent workboat companies and U.S. Coast Guard personnel. The day's program included several presentations, including:

- "The Legal Consequences of 46 CFR Subchapter M" by Dan Fitzgerald, Freehill Hogan & Mahar LLP;
- "Hiring and Retaining Safe Mariners in the Towing Industry" by Grace Lee, PHD, APTMetrics, and
- "STCW and the Towing Industry" by James Cavo, Marine Credentialling Program Policy Division, United States Coast Guard.



(Photo: Greg Trauthwein)

Captain Eric Johansson, Vice Chairman, Professional Education & Training Department, SUNY Maritime, has brought the industry together annually for 15 years for the Towing Industry Forum.

Ulstein and the First U.S. Built X-Bow

Photo: William Stoichevski

BY WILLIAM STOICHEVSKI

Veteran Norwegian designer and builder Ulstein will, for the first time, build one of its signature X-Bow hull designs in the U.S., *Maritime Reporter* has learned. Edison Chouest Offshore's LaShip shipyard in Louisiana is keen to build, and has found a Norwegian partner to share the risk. Judging by ever-evolving Ulstein business models and Jones Act strictures, Ulstein's U.S. foray could lead to series production of the SX 165 offshore construction vessel. The U.S.-built combined light well-intervention and inspection, maintenance and repair vessel will be the second of the type. A prototype will be made at Ulstein's yard in Norway, where close collaboration with is the norm with Island Offshore, Chouest's joint venture partner on the project. Having Ulstein take on all the detailed engineering was said to have been an attractive element to the deal for the U.S. yard, despite its modernity. Chouest will avoid having to assign "80 or 90 engineers" the task of overseeing the newbuild.

"The idea is to build the prototype here in Norway and then to copy that in the United States yard," said deputy chief executive Tore Ulstein.

The first SX 165 will slide the slip in Louisiana "by Christmas 2015" despite changes to the beam and length decided late in development.

"This project is also about developing while building, and that's of interest with respect to the yard's capability. It's different than with (some yards). If you want small changes made, you'll (often) have to come back after delivery. It's very demanding for the shipbuilder."

The Island Performer — an SX121 of similar layout to the SX165 and delivered by Ulstein this July — incurred last-minute design changes that included a beam widened by 2 m to 30 m on a 150 m long vessel. Decisions to make changes were "made in stages" after steel had been laid.

"It's a milestone for us," said Ulstein, of Chouest building an Ulstein vessel in the United States for the first time. Older generation UT designs now owned by Rolls-Royce had once been American-built. The X-Bows date to just 2006, when Bourbon Offshore took delivery of the Bourbon Orca, an anchor-handling tug-supply vessel.

Meeting Jones Act strictures "for at least one vessel" appears to have been important to the Island Offshore and ECO JV that'll operate the two vessels. Island is acting as coordinator on the project.

Larger Loads

Mr. Ulstein, deputy to his equally energetic CEO sister, Gunvor Ulstein, said the vessel LA Ship will build will be able to lift and lower the increasingly large loads demanded by subsea construction operations. Norwegian oil company Statoil has made much ado about its coming "subsea factory." and so larger surface-to-seabed loads are anticipated.

"I think this is a very interesting platform. Having a platform of between 28 and 30 beam adds a lot of capability. We're looking in the direction of doing more with the same platform. We think it'll add competitiveness to future designs," says Mr. Ulstein from the pit of Ulstein's collegial "cinema room."

"The idea is to build the prototype here in Norway and then to copy that in the United States yard." **The first SX 165 will slide the slip in Louisiana "by Christmas 2015"** despite changes to the beam and length decided late in development.

Tore Ulstein, Deputy Chief Executive

The attractiveness of the design — a 750 ton handling tower; 400t main and 140t secondary cranes; two moonpools — to the vibrant-again Gulf of Mexico suggests ECO might want to build more of the type into its backlog. It is understood that production of the SX165 will shift from Norway to the U.S. once the prototype is built, although it could be well into 2016 or 2017 before the first X-Bow built in America is launched.

Despite the promise of a growing deepwater market for subsea operations, Mr. Ulstein tempers his enthusiasm for the vessels of this well-work class.

"I didn't see this as a mass market. There's room for some, but it's not like the PSV market which will (grow) to a higher number (than today)," he says.

He confirms, however, that the future market for these OCV types is in the Gulf of Mexico.

New Approach

In August 2014, when Ulstein unveiled the X-Stern — a design for better station-keeping and working conditions in bigger waves — it was clear designers had spent a lot of time speaking to ships captains and ship owners.

Yet, “taking a walk with ship owners” is, Mr. Ulstein says, just one of two ways he develops a “business model” which grew out of building sturdy fishing vessels that rivaled the Gulf of Mexico’s early offshore designs.

The other model is the “design conduit,” where raw creativity leads to business development.

“We have to balance that creativity with that need to be efficient,” he said, before rhetorically adding, “What is the design stage? In such projects it’s more difficult to decide because you’re deciding while developing your market.”

It isn’t clear which development path the SX165 too, but the X-Stern could well have been creativity driving business. Then again, pointing the “stern toward the weather (and the platform)” is “natural for captains”, so a design — if not a market — was created in support of vessel commanders.

Beyond the Cluster

The density of owners and suppliers in this picturesque part of Norway has forged unique relationships. Friends and family work in the same companies only to emerge in new or existing companies as “competitors who also cooperate.”

The Ulstein relationship with offshore vessel owners like Island, with its growing fleet of offshore service vessels, has allowed Ulstein as yard and designer to risk playing ship owner or at least as co-investor for periods, spreading risk with partners in order to build ships.

“Ulstein without the (local) maritime cluster would be nothing,” said Mr. Ulstein. Sometimes the cluster isn’t enough. When the company took on 1.6 billion kroner in risk to series-produce the streamlined PX121 platform supply vessels in 2011, it looked outside its local maritime cluster to the financiers at Pareto.

Pareto found Nordic American Tankers, which had an office in Sandefjord Norway, wanted in on the offshore market and was building Nordic American Offshore. The PX121 was a yard- and owner friendly design — “the lowest threshold entry into shipping” — and the Ulsteins knew it. Yards “good with steel but who struggle with installations, pipe and electronics” could build it with basic support from Ulstein.

Indeed, building 30 PX121’s since 2012 and selling them has given birth to a new Ulstein offering — pre-commissioning services, a business understood to replicate fitting in Norway for overseas yards, including Chinese yards, where 90 Ulstein staff and newly recruited Chinese cooperate at some five yards.

The SX165 X-Bow project in Louisiana is the high-water mark for yard and designer Ulstein’s cooperation with other builders.

“We’re more than just an ordinary shipyard. We’re investing in vessels,” said Mr. Ulstein.

Indeed, he and his sister now preside over 40 new-build projects worldwide, including five at their own yard in Norway, where “we made it possible to be competitive” despite contract costs “20 percent less” in China.

Wherever Ulstein ships are built, 90 percent of their content is “Norwegian maritime cluster” and “10 percent content from outside Norway”.

“I think the center of gravity is (still) in this region,” said Mr. Ulstein of this patch of western Norway.

At another center — ECO’s brand new shipyard at Houma, Louisiana — a 1,000 strong workforce is already building “several new well-stimulation vessels.”

LNG PSV

"Largest" LNG PSV Faces Tricky Market

BY WILLIAM STOICHEVSKI

Photo: William Stoichevski

The setting is symbolic when Remøy Shipping chief executive Karsten Saevik meets us at Kleven Yard to "inspect" what was about to become the world's largest platform supply vessel (PSV) to operate on liquefied natural gas (LNG).

Kleven delivered Eidesvik Energy's Viking Energy, the first LNG PSV, 10 years ago. Then came Eidesvik's Viking Lady PSV and, in 2012, the Viking Prince. For Saevik, it's the third vessel the yard's delivering to Remøy since his hire in 2012, but it's arriving at a time of plummeting North Sea day rates.

After two years of stinging results despite rising revenues, he's still delivering the company mantra: "To be the leading management company for offshore service vessels."

Focused

Karsten Sævik, Remoy Shipping CEO

What has kept LNG interesting for Norwegian owners, operators and charterers has been Oslo's subsidy of $53.26 per kilogram of nitrogen oxide gas emissions spared the environment for using the plentiful fuel. In January 2015, that becomes just $30.48/kg NOx, a major blow still visibly troubling Saevik. **Suddenly, the economics of boasting an LNG vessel are less good.**

Rem Eir — the Wärtsilä-designed, dual-fuel Type VS4412 — offers a unique shot at securing future earnings ahead of rival ship-owners. The 92.5-m vessel, like the LNG PSV Rem Leader that came before it, offers a chance to make good on what's expected to be cheap future supplies of gas in Europe and the U.S.

Yet, although glut has for a few years defined the gas market, stately Statoil has only envisioned "up to three" possible LNG-filling stations on the Norwegian west coast, even as this charterer of 160 vessels redoes its supply boat sailing pattern to save money.

"Every 35 minutes a vessel arrives at a platform or base," said Helge Såtendal, Statoil principal consultant for marine logistics. The champion national income earner pays $121.9m a year in fuel costs to get its charters to 33 platforms and 20 rigs.

Europe has dozens of LNG import terminals, but just one export terminal, and that, too, is in Norway. Filling stations are still only "to be encouraged." Adding uncertainty to the future fortunes of LNG and vessels using it are the market incursions being made by liquefied petroleum gas (LPG). Rather than refit, some will wait for what LPG or scrubbing technology for emissions brings. Even DNV GL in its The Future of Shipping, calls LNG "the leading short-term alternative fuel."

More certain for the Rem Eir, perhaps, is an industry need for larger PSV's in ever deeper, more remote operations. A giant work space and cargo is what Remøy's new vessel has, and this alone ought to assure more work.

"There's a limited number of (offshore service vessels) of this type due to the high investment cost," Saevik says.

Norway NOx

What has kept LNG interesting for Norwegian owners, operators and charterers has been Oslo's subsidy of $53.26 per kilogram of nitrogen oxide gas emissions spared the environment for using the plentiful fuel. In January 2015, that becomes just $30.48/kg NOx, a major blow still visibly troubling Saevik. Suddenly, the economics of boasting an LNG vessel are less good.

Subsidy turmoil, however, may yet prove a bright light for day rates chopped in half this past year. The NOx subsidy reduction in Norway could mean fewer new-build OSVs of all types, as modern designs equipped for lower NOx become too pricy, at least in the short term. There are no signs of this, and Kleven, for one, has just agreed to build six anchor handlers for Maersk. Fewer PSVs, at least, would help the viability of LNG vessel owners and others dealing with steady cost hikes. Mr. Såtendal says one of the cost-cutting measures being looked at is "cutting unnecessary equipment on standby vessels."

Sulfur Benefits

A more ephemeral boost for LNG as a fuel, for yards like Kleven and for Remøy are the low-sulfur rules about to ban operations for some in the International Maritime Organization's regional Emissions Control Areas.

LNG, says DNV GL, brings with it a 20 percent cut in carbon-dioxide emissions, or roughly Europe's target for all industry by 2020. For non-LNG ships, getting vessels into the ECAs will require retrofits at yards for emissions-scrubbing technology. Retrofits to

Main Particulars

Length, o.a.	92.2 m
Length b.p.	84.3 m
Breadth, molded	20 m
Depth to 1st Deck	9 m
Deck area	1080 sq. m.
Max. deck load /sq. m.	10 tonnes/sq. m.
Fuel oil	1000 cu. m.
Ballast water / Drillwater	1800 cu. m.
Fresh water	1000 cu. m.
Dry bulk (in 6 tanks)	300 cu. m.
Liquid mud (in 8 tanks)	980 cu. m.
Slop (in 1 tanks)	50 cu. m.
Brine (in 7 tanks)	450 cu. m.
Base oil (in 2 tanks)	230 cu. m.
LFL*/Methanol (in 2 tanks)	230 cu. m.
LFL*/Sp. products (in 4 tanks)	400 cu. m.
LNG (tank)	220 cu. m.
Class	DNV GL

LNG-burning are also on offer, and the business could be a boon for LNG-capable yards like Kleven or Ty Offshore in the United States. Saevik downplays the expense of equipping and organizing to cut sulfur and suggests such work "will account for just one percent of the increased cost-jacking" from New Year 2015 (Europe) of the kind he's seen in the offshore segment. It won't, he says, produce a flight to LNG power. He expects the lost Norwegian subsidy to be far more painful. An LNG ship, after all, still costs "from 10 percent to 15 percent more" to build.

"It'll take competition to make that price come down," Saevik said, but "There are many signs that more (LNG) vessels are needed."

With that, we head out to look at the Rem Eir. The going is slow as we move through a hive of foreign-worker teams grinding steel or running wire. We sidestep others installing luxury tiles and insulation. The dual-fuel engine passed strict leakage rules for the pressurized LNG. In an emergency, the motor would tap a smaller diesel tank.

"It's instant," a Wärtsalä man says proudly of the fuel shift. He points out, too, that emissions cuts by the cramped four-engine propulsion system are 85 percent for NOx, 95 percent for sulfur, 25 percent for CO2 and 99 percent for particulate matter. In non-European ECA areas, "You can switch to diesel," someone says.

Scarcity

For now just one of 20 LNG-powered PSVs in the world is powered by LNG alone, but the coming shipping year is expected to see a scarcity of fuel refined to emit less sulfur and carbon-dioxide.

Remoy's peers — Eidesvik or Harvey Gulf International Marine — have reason to hope that fuel shortage will "increase the attractiveness" of LNG, bringing "increasing investment and construction of infrastructure projects", as DNV GL says.

If Norway's NOx subsidy disappears completely, and there's talk that it could, "Then the charter party must be more willing to spend extra," says Saevik said. "They have to expect a higher charter rate," he says. Natural gas is priced higher in Europe than in the States.

Whatever happens, there's always Statoil. "Statoil has been a good charterer," Saevik agrees, although other oilfield operators might not care "to go greener."

The emissions strictures are for real. In Europe, vessels bunkering outside Europe will soon have to take on low-sulfur fuel from the Continent. More IMO rules will kick in 2016 and 2017, bringing rules for NOx and chemicals.

"Some chemicals are not allowed on today's PSVs and OSVs," Såtendal said. "New vessels will be needed."

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Courtesy OilCraft AS

OilCraft's TwinBow Challenge

BY WILLIAM STOICHEVSKI

There's a new vessel design needling this competitive little shipping town. Still unknown in design circles, the "porpoise-nosed" TwinBow is brainchild to local start-up OilCraft and its wunderkind chief exec, Stian Teige, a self-taught computer renderer.

His year-old outfit is going all out presenting designs to the savvy offshore shipping community centered on this picturesque fisheries town with a channel through it. Together with heavyweight joint venture partner LMG Marin — launcher of a thousand ships, many of them drillships or gas-powered ferries — OilCraft is drumming up sales leads for its trimaran and single-hull TwinBows.

Interest from deepwater oil and gas player Statoil; offshore construction specialists; seismic fleet owners and global offshore shipping giants based here has Teige feeling confident a deal will emerge in 2014 for a TwinBow newbuild.

"I have a good feeling. Definitely the goal for this year is to secure a vessel order, and I think it will happen in 2014," he said. By 2015, his intellectual property will be bundled into the new LMG JV.

He's been close to a sale, very close. A year ago, the fledgling company revealed a surprise Letter of Intent for five seismic survey vessels from an unnamed survey company. The order shrunk to two vessels and then put on hold.

The TwinBow seismic survey designs raised eyebrows with its double bows and "triple sterns" optimized for streamer, winch and crane loads. The designs aim ostensibly to achieve the stability of short, wide survey vessels like the Ramform class without compromising on speed.

Teige says upwards of 20 knots are imaginable, and he's readying tests in a tow tank to simulate 25 knots and to show a TwinBow is like having the double advantage of Ulstein's X-bow and the wave-piercing bulb of competitive designs: more horizontal movement; less bobbing or slamming; less drag and resistance and therefore greater fuel economy and stability.

Add the dynamics of a trimaran, and the design truly sets itself apart.

"A traditional three-hull vessel has a narrow main hull. We thought a larger beam would permit larger cargoes and gear, and tests (with researchers) at SINTEF in Trondheim show little impact on drag for having a wider hull," says Teige. The pontoon hulls "adjust" for ballast to offer lower "velocity" through large waves.

OilCraft has also patented two helideck concepts: one tucks communications equipment away beneath it and eliminates the mast for some designs, and a work-deck version for offshore service vessels retracts into the superstructure.

"The 26-m beam will take the biggest choppers," he adds.

On the anchor-handling design, Teige has rounded out the superstructure side of the work deck for space and vision. Arguably the most noticeable patented design is the double bow: one lower to lengthen the waterline and one higher to lift the vessel should it plunge too deeply. Teige came up with the idea while contemplating entering a design competition.

"The jury said it was a good idea," Teige says.

The ensuing design laurels launched a company which he has had to nurse with savings from past jobs, including a position with ships gear maker Odim. He was there when Rolls-Royce, now a rival local designer, acquired Odim. By August 2013, start-up help from export

The "porpoise-nosed" TwinBow is brainchild to local start-up **OilCraft and its wunderkind chief executive, Stian Teige** (pictured left & below), a self-taught computer renderer.

support agency, Innovasjon Norge, was paying off, and a Letter of Intent was quickly revealed. Class giant DNV GL was in early with class approval.

Then, bridge financing fell through, and the client cut the order to two seismic vessels before putting it on hold completely pending finance. The client could be back soon, as some building contracts for those new-builds are understood to still be in place.

If the seismic order falls through, interest in a combined wellboat and fish factory vessel seems strong, and there are other designs. A drawing of a smaller seismic support vessel has been produced at the behest of survey ship owners. There's a krill (medical plankton) trawler for the southern oceans. We also see a rendered inspection, maintenance and repair drawing of a vessel fitted with a 150t crane for remote autonomous vehicle launch and recovery and accommodation for 90.

Another potential client deal also appears near for a small offshore construction design: "On a 120-m vessel, you can

Courtesy OilCraft AS

have 3,000 sq. m. of work space. You can fit bigger cranes to smaller vessels, perhaps up to 600 metric tons," said Teige. He said he needs more structure testing and engineering, but heavyweight JV partner LMG can tap at least one large marine engineering pool, including the 125-strong LMG subsidiary Midcon Designers of Szczecin, Poland.

For now, LMG supports the general design work and has assigned OilCraft the task of pleasing the offshore shipping segment until a new LMG OilCraft AS takes shape. Come early 2015, OilCraft's intellectual property will reside in the new JV.

Filtering out of the sleek, black-and-white office, we bump into a table strewn with drawings of a small anchor-handling tug supply ship, or AHTS. Its round tanks appear recently penciled with squared sides and rounded corners. The drawing says LMG 80.

"This is for a client interested in a series of AHTS's. It has not been communicated to the public," said Teige's CFO, a member of OilCraft's board and a colleague from former employer Seaonics from just down the stairs.

"This is one of our concrete business leads," the young CFO says, adding, "All our concepts are based on actual leads from ship owners."

Something else he says suggests Chinese bank involvement in one of the potential orders and export credits from Norwegian export enabling agency, Eksportfinans.

For LMG, it's clear the new vessel designs offer fresh marketing impetus and a potential new look for future vessels. Already the world's largest supplier of gas-fired vessel types, and no mean OSV designer, LMG ferries, coastguard cutters, motor torpedo boats and advanced research vessels could soon be sporting a new look.

150 Years Young, the 5th Generation Plots the Future Course

McAllister Towing

Boldly, By Sea, By Land

By Patricia Keefe

In 1864 Abraham Lincoln was president, and the U.S. was embroiled in the midst of civil war. In 1864, McAllister Towing was established (originally as the Greenpoint Lighterage Co.) in New York City. McAllister Towing has persevered, and at times, served, through nine wars, 28 presidents, at least three catastrophic stock market crashes; collapsing oil prices, generations of advances in ship technology and vessel construction and design; and an explosion in maritime regulation. The company has had its fair share of high tides and low, but through it all, 150 years later, the McAllister flag still flies high.

"Keep the flag flying!"

That's the advice Brian McAllister gave his sons Buckley and Eric when he handed over the reins of McAllister Towing in 2013 to the fifth generation of family to run the tug and barge company. It's an apt motto for the venerable New York-based maritime firm, which has been in continuous operation under family control since 1864. Brian's pithy directive was a substantial step up in positivity from the parting gloom of his (third-generation) father Anthony, who pessimistically told his son in 1974, "You'll never make it, you can't buy a company with 100% debt and no working capital," after the determined 43-year-old teamed up with his fourth-generation brothers, cousins and one outside partner to put together the $20 million needed to snatch the company out from under a competing Wall Street company's offer at the last minute.

To be sure, it took Brian and his partners four years to finalize the deal, after which they endured a period of "overwhelming" debt – "a terrible struggle for the longest time'' – only to teeter at least once on the brink of bankruptcy after the oil crash of the '80s. But make it they did, and then some.

"The third generation didn't feel it could trust the fourth generation to make a go of it, but we did," says Brian with satisfaction.

They shouldn't have doubted.

Any company that has survived 150 years – and under one family's ownership – has to have grit, determination and drive. It has to have been innovative, not adverse to risk, and in the forefront of driving and or adopting new technologies, best practices, and even new types of business.

This type of longevity is simply not served by timidity and an overly conservative outlook. In fact, you might say McAllister, or MT&T as it is known, is the 'Rocky' of the tugboat business, having come close to going under at least three times in its stubborn history.

But no matter the odds, it appears that family members never gave up, each generation gave it all they had - sometimes in the face of seeming insurmountable adversity - and each generation believed in its ability to turn things around even when their curmudgeonly forefathers had their doubts. (Even the second generation thought the company was done for, and told the third generation to go find jobs elsewhere.)

The company has persevered, and at times, served, through nine wars, 28 presidents, at least three catastrophic stock market crashes; collapsing oil prices, generations of advances in ship technology and vessel construction and design; and an explosion in maritime regulation. **The McAllisters are survivors with a capital "S."**

McAllister Towing has left an indelible mark on U.S. maritime history, from its formative years to the delivery of three modern, state-of-the-art workhorses this year, including Buckley McAllister (pictured right), Eric McAllister and Tate McAllister.

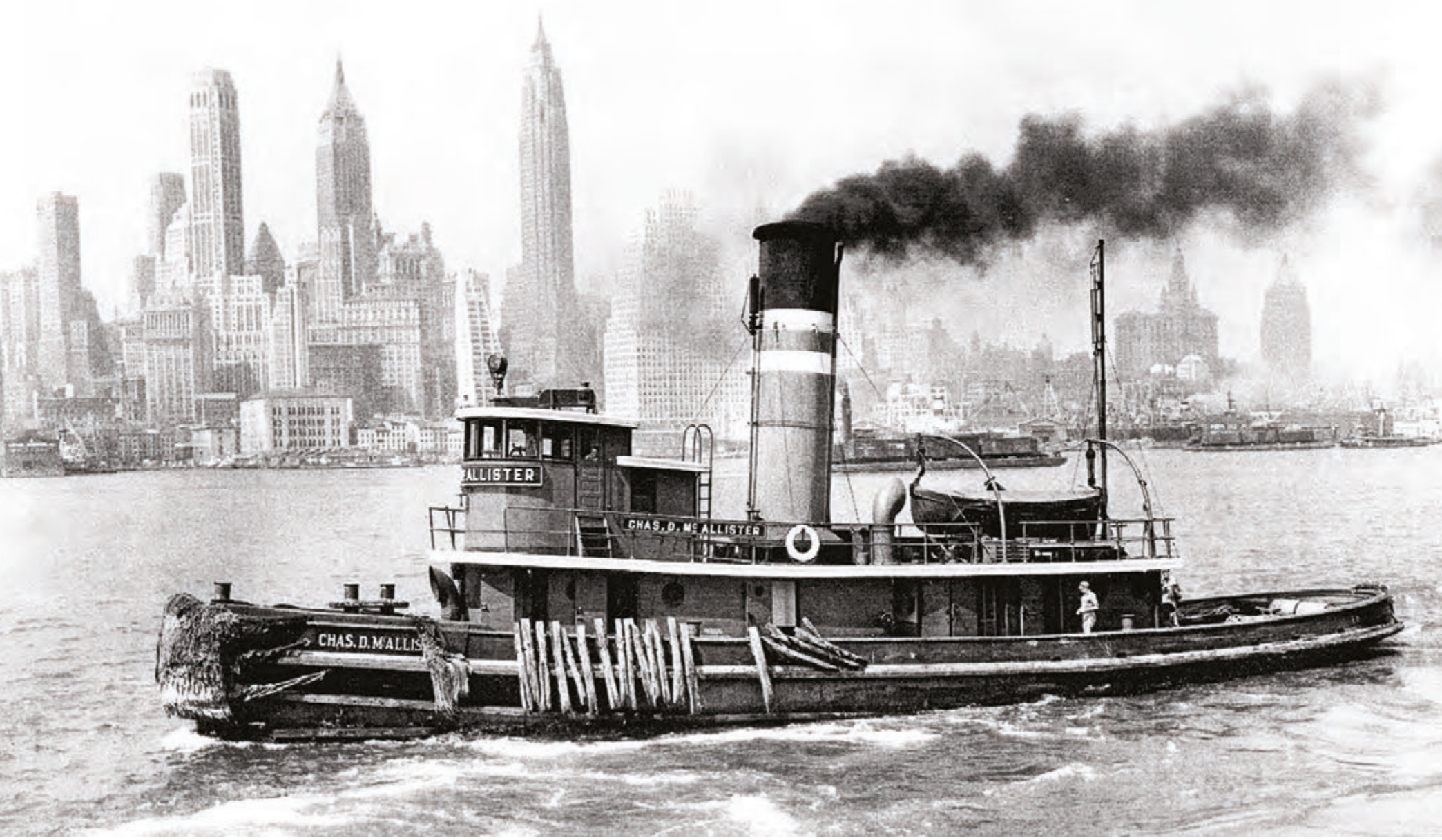


Photo: Birk Thomas

So much so that out of the 700 or so family-owned marine business that once plied their trade in New York's harbor at the height of its preeminence as the busiest port in the world, McAllister has emerged as one of the few surviving tug companies, and the only one to still remain in family hands. The company today is a successful business offering tug and barge and ferry services with more than 800 employees and 85 vessels operating out of 17 locations.

That's due in no small way to the leadership and stamina of Capt. Brian McAllister. Despite his father's doubts, "Brian was the right guy at the right time to put the company on financial footing. He was fiercely determined to continue McAllister as a family-run company," said Edward J. Kelly, Executive Director, Maritime Association of the Port of New York & New Jersey. "Most people would have bet against him for a lot of reasons – internal conflicts (even in the family), financial strain, etc. But he is the guy who forced this company to survive, and deserves laurels for it. He delivered a functional, profitable and competent company to [his son] Bucky to carry forward," said Kelly, who has worked with the McAllisters on various industry harbor issues and projects for decades.

The Hand Off

Brian choose to deliver 98% of the company to his sons after a heart attack in 2005 provided evidence his boys were up to the task. "A lot of general managers told me, 'The one good thing you have going for you is your two sons. We've not had one problem since you've been in isolation.' So I figured the best thing I can do is pass the company down," said Brian. But first, he needed to tackle New York's "devastating" 60% estate tax, which he feared would plunge his boys into the kind of debt he'd struggled through himself.

So the fifth generation is having its turn at the wheel, bolstered by sage advice from the senior McAllister: Balance debt and aggressiveness; make good earnings; don't buy too much; keep debt low and prepare for the rainy day which is sure to come.

And if the luck of one of the few remaining flag carriers of the "Irish Navy" in New York Harbor holds, Brian McAllister will see a sixth generation – his grandchildren and perhaps their cousins – run the family flag up the mast pole and pilot the company into its next 25 year-run. There are already flickering signs of interest from the next generation: his 17-year-old grandson Rowan is working as a deckhand, while Rowan's younger sister Janet worked a summer job in the office as Brian's assistant.

Their dad Buckley, an attorney by profession who put in his own dues working as a deckhand in his youth, has been plenty busy this year, wrapping up a stint this spring as the chairman of the American Waterways Operators (AWO) while executing his duties as president of the venerable tug and barge company, and meeting commitments to a wide array of maritime organizations, agencies and causes. His brother Eric keeps the financial side of the business on an even keel as vice president of finance and treasurer. Rounding out the family tree in management are Brian, who remains as chairman, and cousins Andrew McAllister, vice president of IT; A.J. McAllister III, senior vice president, sales; and Jeffrey McAllister, senior docking pilot at McAllister Towing of NY. It's almost as if the prior generation had plotted out the career paths of their children to map into these management posts.

"What better succession planning could a private company enjoy?," said longtime customer Craig Reinauer, president of Reinauer Transportation. "You have the wisdom of Brian's years complimented by Buckley and Eric growing up in and around the company. Yet, before joining, they hone their skill set in the legal and financial world before joining McAllister. If I were to see any change [since the handoff to the Fifth Generation, I'd say I see depth and a commitment to the future."

First Generation: 1864-1916

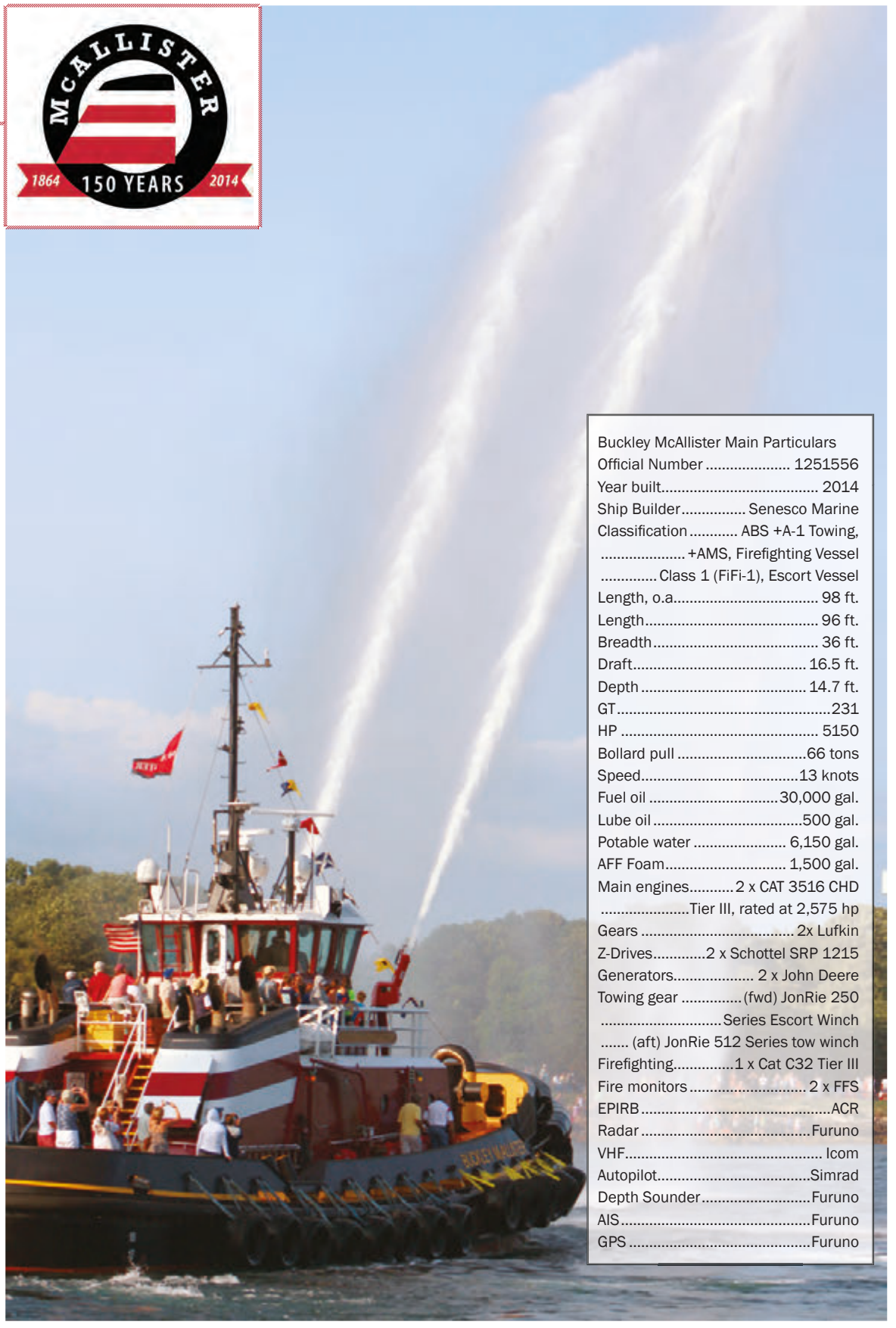
Irish immigrant and seaman **Capt. James "Whiskers" McAllister**, founds the Greenpoint Lighterage Co. in 1864 in New York Harbor with a single sail lighter. (In the early 1900s, the name changed to McAllister Brothers.) Captain James launched his first (propeller-driven) tug in 1876, and was one of the first to convert a sail lighter into a bulk oil carrier, building a small fleet that his son A.J. McAllister said became a force in the movement of oil in the harbor. The company, however, passed on the opportunity to join John D. Rockefeller in forming one of the great oil giants - Standard Oil Co. Over time, McAllister brought over more family members and continued to expand the fleet size and services as New York Harbor grew into the world's largest ever distribution center and port. For example, in 1909, the company launched the McAllister Steamboat Co. and entered the excursion boat business; separately, it became a force in the salvage business. And in 1927, A.J. got himself briefly fired for buying a 375 hp diesel engine to swap into a coal burner steam tug, the Daniel McAllister. The innovative retrofit was a huge success, doubling her hp and dramatically cutting fuel costs and increasing operating hours, paving the way for the shift to diesel. Upon James' death, four sons inherited the towing and lighter business while two of his brothers got the steamboat excursion business.

Escape artist Harry Houdini used a McAllister Tug as a launching point for one of his stunts in 1914. Above, Captain Jim helps to guide the box into the water.

McAllister Celebrates 150 in Style

The 231-gt Buckley McAllister, a 98 x 36 x 14.7 ft. tractor tug built and delivered by Senesco Marine, is one of the latest manifestations of McAllister's continued investment in modern tonnage. In fact, 2014 will be significant for the company not only because it celebrated its 150th anniversary, but also because it took delivery of three new vessels during the year … Buckley McAllister, Eric McAllister & Tate McAllister ... a company first.

Buckley McAllister is powered by a pair of CAT 3516 CHD Tier III engines driving two Lufkin vertical offset reduction gears to a pair of Schottel SRP 1215 Z-Low Speed Drives with a straight line Carbon Fiber Shaft, the tug performed a variety of tight turns and maneuvers. The new addition to the McAllister fleet was celebrated by a number of vessels in New York Harbor, including New York Fire Department's Fireboat 343, which sprayed streams of red, white and blue water from its monitors in celebration.



Buckley McAllister Main Particulars	
Official Number	1251556
Year built	2014
Ship Builder	Senesco Marine
Classification	ABS +A-1 Towing, +AMS, Firefighting Vessel Class 1 (FiFi-1), Escort Vessel
Length, o.a.	98 ft.
Length	96 ft.
Breadth	36 ft.
Draft	16.5 ft.
Depth	14.7 ft.
GT	231
HP	5150
Bollard pull	66 tons
Speed	13 knots
Fuel oil	30,000 gal.
Lube oil	500 gal.
Potable water	6,150 gal.
AFF Foam	1,500 gal.
Main engines	2 x CAT 3516 CHD Tier III, rated at 2,575 hp
Gears	2x Lufkin
Z-Drives	2 x Schottel SRP 1215
Generators	2 x John Deere
Towing gear	(fwd) JonRie 250 Series Escort Winch (aft) JonRie 512 Series tow winch
Firefighting	1 x Cat C32 Tier III
Fire monitors	2 x FFS
EPIRB	ACR
Radar	Furuno
VHF	Icom
Autopilot	Simrad
Depth Sounder	Furuno
AIS	Furuno
GPS	Furuno

To ensure that there will be a healthy McAllister Towing to hand down to a sixth generation, generations four and five are working on a multi-faceted strategy that involves preparing for resilience, problem solving for customers, diversification on land and sea, continued modernization and investing of themselves and the company in the industry and their local maritime communities.

Actually, the company has been especially prominent as a force for change and technological advances down through the years in New York harbor, says Kelly, who noted that the McAllister's forefathers were among the first to join his organization, which dates back to 1873.

"The McAllisters are outward looking. They understand that to be effective in the industry, you have to be an active player in it."

Multi-Generational Relationships

It's not just longevity in family ownership that has kept McAllister afloat the past century and a half. The company can boost multi-generational – third, fourth and fifth generation – employee dynasties, as well as business relationships that stretch back almost 100 years. At least one family of employees – the Tookers – is in its fifth generation working for the company, marvels Buckley McAllister.

In 1883, P.T. Barnum and a group of 26 shareholders launched the Bridgeport & Port Jefferson Steamboat Co. A Capt. Charles E. Tooker and his brother-in-law owned the controlling interest. McAllister eventually acquired the company, and with it apparently, generations of Tooker employees. Today, two Tooker descendants, brothers, work for McAllister as a docking pilot and a ferry captain.

"Being a family company certainly helps with developing relationships with the crew," says Buckley McAllister, adding that multi-generation employee families "shows the long-term relationships involved in the business, because there really is so much trust and mutual commitment involved."

On the client side, "Our oldest contract is with a Chilean fruit company – 80 years – but I think our oldest client is the U.S. Navy," he added. And vice versa. McAllister at one point purchased and retrofitted a number of government tugs when the U.S. Navy decided to get out of the tug business. "To have relationships go back that long is pretty amazing," said Buckley.

Among McAllister's oldest clients are Maersk Line (1904), Bouchard Transportation (founded 1918), Reinauer Transportation (founded 1923) and Orient Overseas Container Line (founded 1947).

For some companies, like Reinauer, the ties run deep. "I've heard stories that Brian worked for my grandfather as a teenager at a shipyard that, at the time, was a partnership between the Reinauer and McAllister families," recalls Craig Reinauer. The companies' relationship, he suggests "predates"

Second Generation: 1916-1936

Lead primarily by one of "Whisker's" sons, Captain Jim, the management team included his brothers John E., Charles D. and William H. By 1918, the company had moved into the ocean towing business, operating one of the first deep-sea tug-barge combinations with the tug C.W. MORSE, running molasses between New Orleans and Cuba. The company profited from industry highs, tripling the size of its fleet with tugs, barges, sidewheelers and derricks. It had a successful excursion boat run until the mid-20s, when a fire decimated the fleet. (The advent of autos sounded the death knell for excursion boat companies, which were gone by 1938.)

The company also endured crushing lows, including the impact of the great Depression, which shrank the company fleet back to a lone tug. Capt. "Jim" was said to have died of a broken heart as a result, at 66. During his tenure, he also outfitted tugs for ocean crossing during WWI, sat on the Board of Embarkation for the U.S. Government and served as Acting Director for the U.S. Army's floating equipment.

"You'll never make it."

That was Anthony McAllister's prediction to his son Brian, upon the latter's purchase of the company in 1974. **Brian proved his father wrong.** Above he addresses a crowd of more than 800 during the company's 150th Anniversary celebration in NYC.

both himself and Chairman Brian McAllister. But it's driven by mutual respect and a commitment to the same values, he adds. "In order for McAllister to work for us, we audit them at the same level that we are, to ensure that they are an extension of the service we offer our customers. The long-term relationship is simple, it's the philosophy of give-and-take during the good times and bad, certainly ones that we have both extended to each other over the years," says Craig Reinauer, noting that McAllister is Reinauer's primary towing and assist provider.

On the employee side, the McAllisters run a fairly decentralized operation, trusting in the skills and knowledge of the people they have chosen to represent them in different ports and on their vessels. "There is a comradery at McAllister. Employees recognize the tremendous loyalty and obligation to carry on the family tradition," said Kelly. "They treat employees like family, 'We're all in this together.' I think Bucky is an integral part of developing this comradery – he's a roll-up the shirtsleeves, 'I'm with you, let's get this done,' kind of guy." Capt. Brian, of course, was on the water himself for many years piloting McAllister tugs, so he is keenly aware of the challenges faced by his seagoing employees.

The McAllisters are gratefully aware of the value of these long-term relationships, which they celebrated at their 150th birthday bash in New York in September. Employees and customers were among the 800 attendees at the gala, which also saw the christening of the tractor tug Buckley McAllister.

Follow the Customer

You can't buy that kind of loyalty and commitment to a brand. As the cliché goes, you have to earn it, every day. And the McAllisters do, by following a very simple credo: "Everything we do is based around solving customer problems, and around listening to our customers, to anticipate what their needs are going to be, and reacting to those needs," said Buckley McAllister. "Because of the variety of different things we've had to deal with here, one of our strongest traits is a lot flexibility and creativity in dealing with problems. It's one of the things that distinguishes us with customers."

"Whenever I see a company not doing well, a failure to be attuned to what is going on with the customer is usually a big part of that problem," Buckley adds.

"Anticipate" is the key word here. That means trying to get ahead of the curve, sometimes even before the client is ready to tackle the issue, or even knows there is one. "In some cases the customers doesn't know what they need. We've been very lucky to be able to respond to customer needs at times before the customer even made a specific demand," says Buckley.

Making that kind of "luck" takes a bit of a gamble, and an investment in not just dollars, but patience. For example, in the mid-1980s, McAllister built one of the first tractor tugs on the east coast.

Photo: Dave Cleaveland

From Maine to Hollywood

Tate McAllister is significant for a number of reasons. It was the company's first boat built at Washburn & Doughty in Maine; it is the third newbuild to join the McAllister fleet in 2014; and it is named for actor Tate Buckley Donovan (pictured), a first cousin to the McAllister family. Donovan is known for his role in the FX drama Damages as Tom Shayes, and for his role as Jimmy Cooper in the American teen drama television series The O.C., as well as a long list of movie credits.

"For the first decade we owned the vessel we were never able to find a customer willing to pay more money to have that tug work for them," he says. But by the late '90s, a lot of customers were requesting tractor tugs. Ships were getting larger, and there was more recognition that tractor tugs provide a bigger safety margin and helped to dock ships faster and more efficiently than conventional tugs. McAllister has been steadily adding tractor tugs to its fleet and so far has 28.

And there's a crew boat, bought a few years ago, currently sitting idle. It's been used a few times, but it was really purchased with an eye toward offshore wind farms. On the surface, that might seem overly optimistic. Huge in Europe, not one project has gotten off the ground in the U.S. The two most advanced projects are off the Rhode Island and Cape Cod coastlines, but both efforts are mired in lawsuits. And attorney Buckley McAllister knows what that means. But he also expects that eventually, one of these projects will break free of the legal logjam, and when it does, he wants to be ready.

"It's a bit of the chicken and the egg," he admits. "We have the boat, but no call for it yet. But if a wind farm comes to you, and you don't have the equipment, then you lose the business." For McAllister Towing, that's the bigger risk. So in the meantime, the McAllisters will wait for their ROI.

As for patience, building any boat requires a huge investment, and when you are looking at a 40- to 45-year life span, there is little expectation of ROI in those early years anyway, he shrugs.

The McAllister know a thing or two about patience, having seen the company almost go under three times over its lifespan as history took the industry on a rollercoaster ride. From the company's hardscrabble beginning with one ship to sharing in the explosive growth of New York harbor in the post-Civil War years when it provided over 40% of the government's tax revenue and was the busiest port in the world; to obsolescence and changes in vessel propulsion, design and fuel; to the combined impact of the Smoot-Hawley Tariff Act of June 1930 and the Great Depression, which "took a successful company to zero," barely hanging onto a single vessel; to the beginning of America's love affair with the automobile, which killed the excursion boat business; to service in two World Wars, including handling all munitions and explosives in New York Harbor under the spying gun sights of German U-Boats; to expansion into, and at times, flight out of, the volatile oil industry; to the economic depressions of the late '70s and mid- to late 2000's; to the demise of some businesses and the advent of new opportunities right up to today's expanding regulatory environment and the arrival of monster ships carrying more cargo, but arriving in fewer numbers and so requiring fewer tug assists. Patience isn't just a virtue – it's a requirement to function in this business.

So when clients ask the McAllisters to build firefighting capability into their new tug designs – even if they then appear for a while unwilling to pay for tugs with that capability – they'll bite. More clients will ask that service, and eventually, they'll see the wisdom in paying more for tugs so equipped. It's a calculated gamble based on customer needs. And those usually pay off.

The Big Ship in the Room

Taking their cue from another customer trend – the slow decline in numbers of ships as the vessels are replaced by bigger and bigger boats – The McAllisters are building increasingly more powerful tugs. "Ten years ago, the 4,000 hp tractor tug was what everyone targeted. Today, no one would think of building one. Today its 5000- to 6000 hp tugs,'' according to Buckley, like the new build Tate McAllister (pictured above), which fea-

Third Generation: 1936-1974

Led by three of Capt. Jim's sons – Anthony J. (Brian's father), James P. II and Gerard (other cousins also worked in the company). The lighterage business shrank after WWII, making ship docking McAllister's primary business. Between the two World Wars, a fleet of 27 ocean-going tankers was operated by McAllister to all parts of the world for the U.S. Shipping Board. During WWII, the McAllisters were responsible for moving munitions and explosives through the harbor, dangerous work given the threat of explosion and the presence of German U-Boats around the harbor. By war's end, they had 35 mostly wooden steam tugs, and found their main competitor, Moran, controlling almost two-thirds of the ship docking business. Over the next 20 years the brothers continued to diversify and built the fleet up to 50 vessels, and expanded their services to six ports, including ones in Pennsylvania, Virginia and Canada. In the early 70s, the three owner brothers – Anthony, James P. and Gerard – decided to retire, but wanted to take their equity with them.

tures two EMD 12-710 diesel engines rated at 3,000 hp each. These tugs come with a tradeoff – a 6,000 hp tug burns fuel at three times the rate of a 2,000 hp tug, but its engines produce cleaner exhaust, an important feature when seeking compliance with emissions regulations. More than two-thirds of the current fleet was added after 1998.

The 18,000 TEU ships coming from the likes of Maersk will be looking for escorting up and down the coast, says Buckley, adding, "We're starting to do it." He also noted that super tankers pulling into the Portland, Me. harbor are looking to tugs for insurance, requiring escorting just in case they suffer equipment failure. "All these mega ships were built long and narrow for speed at sea and not for tight turns in harbors, and they are willing to pay the extra cost of tug boating in most cases. They want the safety of the tug boats. These channels are not that wide, and if an engine or rudder fails, they'll be in deep trouble." The situation is becoming more prevalent, according to Buckley. "It's the only upside I can see because the number of ships continues to decrease as the ships get bigger."

In response, "the goal is to efficiently provide high-quality services to the customer, and to do that we will continue to need more tractor tugs and to figure out how to price more efficient services to customers. And we are certainly trying to find broader ranges of services that we can provide, which is one of the reasons we broadened the emergency response capacity of our fleet," said Buckley.

The bigger ships may require more assistance from more powerful tugs, but it's still going to mean a decline in the ship assist business, agrees Kelly. He sees strong growth potential instead in diversification into domestic and coastal shipping,

Fourth Generation: 1974-2012

Realizing that the retirement of the Third Generation meant the likely sale of the firm, Anthony's son Brian A., sprang into action. In 1969 he formed McAllister Towing and Transportation with his brothers Anthony, Jr., and Bruce, and cousins Neill and James, as a first step toward purchasing McAllister Brothers. Together with a partner they bought the company in 1974 for $20 million, taking on a load of debt. Over the years, the company moved in and out of the volatile oil business, which at one point left it drowning in debt and nearly took it to bankruptcy. It was this generation that started modernizing its tug fleet, first with flanking rudder, twin-screw boats, and then with Z-drive tractor tugs; it continued to expand into ports up and down the eastern seaboard; and it got serious about its stake in a passenger-car ferry service running between Conn. and N.Y., by upgrading the fleet and taking on sole ownership. In 1979, Bruce left the company to become the deputy assistant secretary of commerce for the Maritime Administration, selling his shares back to the company. In 1980, the company moved its last lighterage barge. By the late 1990s Brian's sons were fully on board. During much of this period the company was led primarily by (current chairman) Capt. Brian A., who began working for the company at 15 in 1947. He went on to graduate from SUNY Maritime College, and because of a family rule that no more than two sons from any branch of the family could work at the company at a time, he went into the Navy. He briefly worked at American Export Isbrandtsen Line before joining McAllister in 1959, working the boats until moving to an office job in the late 60s. He became president in 1984 and chairman in 2013, coinciding with his 80th birthday, whereon the presidency was passed on to his son Buckley.

Brian, James & Tony McAllister

Brian McAllister

which he says tugboats are uniquely equipped to exploit. Also, "as roadways get more congested, there might be more waterborne movement of truck freight."

Consolidating to Growth

The McAllisters are also keenly aware of the consolidation ongoing on in the industry – much of the current ship assist and docking work is split between McAllister and Moran, and Brian was quoted in 1995 saying that tugboats no longer generate the majority of company revenues. Moreover, when family members look out across the water, they see more cargo arriving on ever fewer ships. That's not a good omen.

It means already fierce competition is about to get worse, which means the McAllisters will need to offer not just more efficient and effective services, they will need to branch out into new services. Those services will likely come by way of more modern vessels and an already demonstrated willingness to expand into other locales and types of businesses. McAllister has always been a timely buyer of surplus vessels and promising business opportunities. It is how the company has expanded over the years out of New York harbor and into 12 major ports across the eastern seaboard and in the Caribbean from its San Juan base.

And it continues to look for acquisitions and expansion that make sense today. For example, Brian and Buckley describe the purchases of operations in Portland, Me., Providence, R.I., and Charleston, S.C., as a "significant help to our overall franchise." More recently, McAllister bought out a small concern in Boston Harbor, and as of late October, was waiting to hear from a company that was considering selling.

The business today is 30% ferry, 50% ship assist, with the remainder split between ocean towing and miscellaneous projects. With the fifth generation at the helm, the company has broadened its diversification efforts into marina and terminal operations, oil barge movements, leasing, emergency response (a direct response to customer requests), towing construction materials, towing scrap, and in some cases, he says, the company is working with customers to try and make sure "we can facilitate maritime transport."

Toward that end, it is working with MARAD and the Maine Port Authority on an articulated tug-barge design and business plan to create a water-borne connection between Maine and Brooklyn , N.Y. The project is still in the feasibility stage.

It also contracts out some of its vessels, and continues to take on salvage work.

Relying on Resilience

The fifth generation is also counting on the concept of resilience to keep the flag flying. A favorite watchword in the industry and with Buckley in particular, resilience is about preparedness, in order to have the ability to bounce back from various forms of adversity – be it nature-driven or man-made. Being resilient is important to customer relationships, and to the continued health of the industry and the waterways on which it plies it trade.

For example, ticking off three disasters that have befallen the New York – New Jersey area in the last 15 years – 9/11, the great blackout and Hurricane Sandy - Buckley noted that his company, while displaced by two of those events, remained up and running throughout, in each case. "There is no question customers have come to rely on us to be ready to respond to these types of incidents. We put a lot of resources into making sure our operations are resilient," he says, noting that there is a lot more planning for resilience now than there was a gen-

Fifth & Sixth Generations

Currently led by Brian's sons Buckley (president) and Eric (CFO and treasurer), working alongside Brian (still chairman) and cousins A.J. the III (senior VP sales), Andrew (VP IT) and Jeffrey (senior docking pilot in NY), this mostly under 50 generation is strongly focused on diversification, modernization, safety and industry involvement. From a high of 800 tugs operating in NY Harbor in 1929, there were fewer than 200 in 2006, and even fewer working today. The Fifth Generation is the first to feel the effects of ever bigger container ships: fewer ships carrying more cargo, which means a steady drop in tug jobs. Other business ventures, including marine terminal operations and firefighting, will have to pick up the slack from the shrinking ship docking aspect of the business. At least one member, Buckley's 17-year-old son Rowan, is already gaining experience working as a deckhand. His sibling and cousins will face a very different landscape than was faced by their fathers, and certainly grandfathers. The rise of gigantic post-Panamax ships, shipping conglomerates, and expected continued growth in the LNG market, means the next generation will have to continue, to a great degree, the Fifth Generation's fleet modernization effort in order to support fewer, ever larger and more powerful vessels – possibly even different vessel types. They will have to focus harder on diversification opportunities - particularly on land - as the number of ships entering ports continues to fall. The Sixth Generation will also have the opportunity to continue the McAllister penchant to risk early adoption of advances in the next waves of vessel, communications and computer technologies. Aided by a little of the McAllister grit and luck, to quote George Matteson, a former tugboat operator and author of *Tugboats of New York*, "May the dynasty continue!"

Top: Brian, Buckley and Eric McAllister on a tug.

Middle: (From left) Janet McAllister (6th gen, Buckley's daughter), Buckley, Emily & Robert McAllister (6th gen, Eric's daughter and son), Rowan (6th gen, Buckley's son), and Beth Morrow, Buckley's wife, at the christening of Buckley McAllister in New York City.

Bottom: (From left) Rowan McAllister showing some rope skills; (middle) Buckley McAllister does the honors in christening Janet McAllister, as his then infant daughter looks on; (right) teenaged Janet McAllister returns the honor in christening the boat named for her father, Buckley McAllister, earlier this year.

eration ago.

"Bucky was a key player in Sandy. While everyone else was at home worrying about family, he was in the Coast Guard headquarters on Staten Island working with the Coast Guard, NOAA, and other agencies to make sure the harbor was operating as normal as quick as possible," says Maritime Association executive director Kelly. Buckley, meanwhile, lauded his crews, who stayed on the job and continued to work until they could be relieved. But resilience doesn't just happen. You have to plan for it, by thinking ahead, by exploring what ifs, by working together with all the stakeholders to build a platform on which emergency response can rest, and by testing procedures and holding drills – all aspects of which the McAllisters are heavily involved and invested. One way to ensure resilience from a corporate standpoint is to keep the debt down.

Dodging Debt

Ironically, Brian McAllister had to initially ignore the most useful piece of advice he got from his father: "Don't take on too much debt." Of course, Brian and his co-investors had to do just that in order to buy the company in the first place – the third generation wanted to retire, and they wanted to take their equity with them. To keep the company in the family, the fourth generation had no choice but to buy their parents out or watch the company be sold to strangers.

And there was that period in the 1980s when the company stretched itself too thin, going deep into debt building a fleet of 35 supply and crew boats for its lucrative worldwide oil support businesses. Unfortunately, the oil market crashed, forcing the company to divest itself of 18 vessels, while the associated debt left the company financially constrained. "That was the big one for us; it almost put us under," says Brian.

After that narrow escape, Brian began to curb his desire to become big and grow in favor of balancing what he once described as "growth in a correct manner versus taking on too much debt." In fact, his game plan in 2001 – " increasing the company's liquidity and decreasing our debt while maintaining our position in an industry that demands constant rebuilding and upgrading," is still valid 13 years later.

Even better, "Right now, there are no problems we face in any shape or form that are threatening," said Brian. There will always be problems, of course, and certainly the company faces challenging issues today as spelled out above. But if the past is any indication of the future, the sixth generation had better start paying attention at the dinner table as there is sure to be at least one more opportunity to keep the flag flying down the road. And Capt. Brian, fourth generation, can think of no better legacy than that.

McAllister Fast Facts

MacAlister (McAllister) Clan Motto The motto above the crest is "fortiter," and below the shield, "per mare, per terras." They translate as "boldly" and "by sea, by land."

Founded As Greenpoint Lighterage Co., 1864

Years in continuous operation 150.

Current Family Involvement Brian A., chairman; (son) B. Buckley, president; (son) Eric M., VP, CFO and treasurer; Andrew, VP of IT; A.J. III, SVP, sales; and Jeffrey, senior docking pilot at McAllister Towing of NY.

Headcount Around 800.

Identifying Colors Red, white and black stacks; red housing with white trim and roof sitting on black vessels with a yellow stripe.

Fleet 80 vessels, predominantly tugs, of which 27 are relatively recent or new (three new builds this year, a record for the company) high-tech, Z-drive tractor tugs; six Tier II-compliant tugs; about a dozen barges, most of which are non-load line, small inland vessels except for two 300-ft ocean-going deck barges; three ferries; 20 plus vessels involved in coastal towing and 35 ABS load line classed vessels.

Primary Business Currently ship docking and general harbor assist, with coastal towing and bulk transportation. NY bookings comprise 25% of the business.

Inventor. Builder. Entrepreneur. Optimist.

Schweitzer

Photo: SEL

"We invent, design, manufacture, sell, support and teach just about anything that has to do with the control, protection, automation and use of electric power."

Edmund O. Schweitzer, III, founder of Schweitzer Engineering Laboratories, Inc.

Inventor. Builder. Entrepreneur. Optimist. Take your pick, and you have described Edmund O. Schweitzer, III, founder of Schweitzer Engineering Laboratories, Inc. (SEL) in 1982. Starting in his basement with an idea and a plan, he has seen his start-up blossom into a global electric powerhouse that is making significant inroads in the maritime and offshore markets. To its core Schweitzer Engineering Laboratories, Inc. (SEL) is an engineering firm that seeks to not only develop and deliver engineered solutions per its client's need, but to take its broad base of engineering expertise and apply it across industries, to solve problems known, as well as those not yet conceived. To its core SEL is an expert in all matters electric, living daily its mantra of "Making Electric Power Safer, More Reliable, and More Economical." While the founder and president's name is the company's too, SEL … to its core … is all about its employees. It is 100% employee owned with more than 3,600 employee stakeholders filling 50 offices in the U.S. and another 40 offices worldwide, serving more than a dozen industries, including a high profile role in the U.S. Navy's Makin Island (LHD 8), and various commercial endeavors in the offshore energy and maritime transport sectors. We spent the day with Schweitzer on his vast Pullman, Washington, campus to discuss the history and future trajectory of his company.

BY GREG TRAUTHWEIN

For the benefit of the readers of Maritime Reporter & Engineering News, can you tell us how this all started?

I was a professor at Washington State University, teaching electrical engineering. I continued to conduct research based on my PhD research at WSU, and developed some working prototypes of the world's first digital protective relays. At the time I thought; 'I wonder if I could make these practical enough, of high enough quality and low enough cost that this technology could be put to work by electric power utilities.'

So I decided to try it and began first as a consultant, as I wanted to save enough money to maybe one day start a company. I finally decided to try and make it work, so I went down to half time at Washington State University and in our basement essentially commercialized the work that I'd done at WSU, turning it from laboratory prototypes to commercial products.

The first order came from Otter Tail Power Company in Fergus Falls, Minnesota, which bought the first units simply as fault locators; we had set out to make a digital protective relay, but maybe nobody was going to trust their power system to protective relays made by a professor in his basement!

So they put them in, tried them as a fault locator and figured out they were pretty good relays, too, and they were also the first protective relays that anybody could communicate with. I knew that by putting a serial port we could communicate with them remotely, which was kind of a neat advantage because you could tell where a fault was before you sent out a line crew. Previously, people had no idea

(where the fault would lie), and they literally would fly the line with helicopters or drive it (to find the fault).

Were there concerns about security of the device, of the power line, in those early days?

Putting a communication port in and using a modem and then a telephone line opened up the possibility that somebody else might either happen onto, or look for, the protective relay. So even in 1984, the very first units that we made had two levels of password protection, so you couldn't do anything if you just ran across it. You would have to put in a first level of password to look at any information, and after that, a second password that would give you access to changing the settings. So even from 1984, we had considered cyber security, which is what we call it now.

You have a very broad product and service offering. How would you concisely describe your company today?

We invent, design, manufacture, sell, support and teach just about anything that has to do with the control, protection, automation and use of electric power, whether it be in electric power utilities, or generating facilities, factories, or, of course, ships and offshore structures. That is the bread and butter. Out of this have come any number of technologies and products that are useful, not only to the industries I mentioned, but to many others.

For example we have developed our own computer for use by electric power utilities, a computer for use where we needed a broad temperature range and a very high level of reliability. We didn't want maintenance issue such as fans. So now we have great computers, computer technology that could be used anywhere. You start to think about what can you do with a perfectly silent computer, a computer with no fans in it, and a computer that gets rid of its heat with some really clever heat pipe technology. That means you could put the computer in a recording studio, or a broadcast studio, for example. Or its high temperature rating and no fans means you may not necessarily need a server closet with special air conditioning. So it's interesting how the technology from one industry starts influencing others.

So when you look at the company, how is SEL the same today as it was when you started?

It's the same values. Many of the same customers. Otter Tail Power Company was our first customer, they are still a great customer today, and there are many others. Also we have a strong sense of creativity and inventiveness … a 'can-do' attitude in that we realize there are many things that we haven't done before and we are going to keep learning and figuring out ourselves.

As an engineering company, I would think that would be a good cornerstone.

Yes. I guess one of the things you could say is that our middle name is still "Engineering." Another point that is the same, and important, is that the products are made in the United States. We do have an operation in Mexico that makes modular control houses, but that we started to serve that market in Mexico, not to chase cheap labor. Today that outfit exports to 30 countries itself.

Looking at the U.S.-made portion of your program, as you have seen companies go off and chase cheap labor, in your mind, how do you do it? How do you stay competitive as a U.S.-made manufacturer?

I have never seen any value in the proposition of chasing cheap labor. The objective that we need to have first and foremost is to serve our industry. If we focus on that with quality, reliability, fair prices and unquestionable ethics, then our customers appreciate that. We start there. And then labor – or call it activity – is just an ingredient of that. If you work for me, it is part of my responsibility to make sure that whatever you are doing is worthwhile. So for us to find new ways to automate things is very much in line with that philosophy. If some people in those early days were building things by hand, think about what a step up it was for their work when we got the first solder machine. So instead of soldering each connection by hand, these folks were not laboring, they were now operating a machine. So then, that starts engaging their mental processes in the running of that machine, and the value of their work goes way up. So the more you do that through the processes of business – whether it's building a relay or designing a complete electric power system – we look at how we can we make the value of that work go up while keeping downward pressure on our own prices. With that strategy we have been able to be very successful. We have been profitable every year.

When you look at your history, over the scope of your company, what one technology do you think has had the greatest impact on your business to make it more efficient?

Automation.

In what regard? Or better yet, what is your definition of automation?

Well, I guess I could answer the question about five ways and I'd give it some thought so I could give one answer. When we start out, you want to be able to do something more or less by hand. To become more efficient involves robustness, repeatability and a high level of quality. And there's no way that you can get there without automation.

So, looking back then, how is your company different from when you started?

Today we are 100 percent employee-owned, which is really very important to me.

Why is that?

Because it gives the company an ownership model that I believe is certain for the future. That as time goes on, somebody else would own the company and I really wanted it to be the employees because they are all so invested with their time and work. I want to make sure that they benefit from it, not only in the short and medium run with their paychecks, but in the long run, benefitting from the real value and commitment that they're involved with every day.

(Note: At press time Schweitzer Engineering ranked number 38 on the National Center for Employee Ownership's list of America's Top 100 Largest Majority Employee-Owned Companies. www.nceo.org)

SEL is a large company, but you operate in a field inhabited with global titans. How do you compete effectively?

There are so many examples that I could give, but I think the general one is that SEL sticks to its values, and one of our values is integrity. If our customers ask us a question, we will answer it honestly, to the very best of our ability. I believe our customers know if they come to us that they will get an honest and respectful answer. It may not necessarily always be the information they want to hear, and whether it ends up good or bad for us, it will be the truth. I don't want to imply that someone else wouldn't do that, but I think our customers really hold us in very high regard. We are really straight shooters.

SEL is a great story. Ten years ago you were 400 people, and today 3,700. What was the impetus to drive that growth?

Focus on our purpose.

And, again, your purpose…

Is to make electric power safer, more reliable and more economical.

As maritime, offshore and subsea are my primary points of focus, can you provide insights on the role those markets play in your company today and the potential you see.

Electric power is the most convenient way of distributing energy. So

SEL's sprawling campus in scenic Pullman, Washington, is a testament to rapid but controlled growth, and a never ending investment in R&D and technology.

when you are trying to control energy reliably, carefully and quickly, electric power is perfect for that. We are experts at the control and protection and automation of all things electric. So in the Navy and other maritime areas, the loads on applications and electric power on ships is growing today. It becomes a wonderful opportunity, but as it grows there are new kinds of protection and control problems that the shipbuilders will encounter.

Is your business cyclical? How did SEL weather the global economic storm of 2008/2009?

The utility business tends to be not very cyclical. Increasingly the economies of countries in the world's are linked, so they tend to move together. But in the electric power industry, for the most part, the cycles are very shallow. Then the bottom falls out of the U.S. economy, in 2008 and 2009. What happened here? We saw a little bit of a pullback, but we still grew and we were still profitable. The pull back we saw were customers who had plans, but then decided that they would wait to see if they could get the government to subsidize it with the ARRA money.

I always ask a question about investment, and that seems actually stupid in this case because I walk around here and I can see where you're investing. And I walked through the R&D facility, which I understand is new, including the amazing three story test chamber. *(Pictured on page 86)*

Isn't that incredible! I think the new research building was about $10 million, and add another $2 million on top of that for the chamber, as well as another $5 million of equipment in the building.

I know you are a private company, but can you quantify for me the annual expenditure on R&D?

When you walked through the front door over there (at the new research building), you probably saw on the floor a saying; "The best way to predict the future is to invent it." So that ought to give you a really good clue about how serious we are about that. The percentage of sales that go into our R&D is in one word "impressive." And I look at industry trends of what other companies invest in R&D and it's… it's something to be very proud of here.

Is there any big investment on your horizon right now that you'd like to discuss?

Yes, a fun one. That is our SEL Family Center.

I guess that would follow on with your honor in 2012 being named by *Fortune Magazine* as one of the 100 Best Places to Work?

Yes it is.

So can you discuss your overarching philosophy on finding and keeping good people?

There's all kinds of aspects to this. We are not just hiring engineers – we need every walk of life. But people want to feel safe. They want to be challenged. They want to be appreciated and be a part of something

that's important. Also, being well-compensated is a part of being safe. So we do really well on all of those things. The company pays well, and now will have the benefit of being able to take our kids there, too, right? Of course, people have to pay for that benefit, but it's right there and it's a high level of quality and it's under control and people can go see their children at lunchtime. There's just a marvelous thing about living in a community like this and being close to your family and to work. The employee ownership is a big deal in that people aren't "renting" their jobs here – they're "owning" them.

The contribution to the ESOP has been huge every year. It's been a major, major part of people's compensation, which means that their retirement security has grown. And we're old enough now where there are a few people that do retire. Most of them are younger than I am. There is a woman who worked here as an assembler since almost the first days of the company and she recently retired after 30 years. And she retired very comfortably, thanks to the employee ownership.

And the work is interesting. We make sure that the engineers and the production people have the best tools and the processes to do their work with, so you're not trying to dig a hole with a teaspoon when you need a steam shovel.

You have been very gracious with your time, and I have just one more question. Every business has its challenges. What is the biggest challenge in your business?

[redacted] (Long pause) Well, I guess I could think of a whole bunch of little things, but those are things you just work on every day. If you say what's the "biggest"… I don't know. I guess I'm a pretty optimistic kind of a guy. I like to keep looking forward and anything that might be a challenge ends up right over there in the opportunity pile. There are just so many opportunities. Maybe the biggest personal challenge that I have is to make sure that I'm imparting the enthusiasm and the fun and the value of what we do for people around the world in all kinds of industry, when it comes to the safe, reliable, economical, generation and distribution of the use of electric power.

Edmund O. Schweitzer, III

Edmund O. Schweitzer, III, founded SEL in 1982 in Pullman, Washington. The company introduced the world's first digital protective relay to the electric power industry in 1984. That same year, Otter Tail Power Company in Fergus Falls, Minnesota, became SEL's first customer. The first SEL digital relay, the SEL-21, revolutionized the power protection industry by providing fault locating and real fault data at a much lower cost to the customer than traditional electromechanical relays. With the introduction of the load-encroachment element for feeder protection, synchrophasors as a standard feature in protective relays, and MIRRORED BITS relay-to-relay communications, SEL continues to set the standard for technology. In 1994, SEL became an employee-owned company. In 2009, it achieved its goal of 100 percent employee ownership.

Denet Towing Repower Saves 20% in Fuel

Jerrold Denet, owner of Denet Towing in Boothville, La., is as straight forward as they come. When asked why he started his towing company in 1982, the response was incredulous: "Why did I start it? I started it to work and to make money!"

When asked why he repowered his M/V Ocean Pride from a 12-cylinder V with a pair of six-cylinder in—line Scania DI-13 continuous duty engines with 450hp @ 1800 rpm through Twin Disc MGX 516 marine gears, the answer was similarly blunt: "This is where my money is best spent," said Denet. "We are producing more power and burning less fuel.

We were burning 23 gallons an hour with the V12 and with Scania power we're burning 18 gallons an hour. We're saving 120 gallons in a 24 hour period, and at $3.25 per gallon it adds up fast." The Scania engines were delivered through NRE, the engine maker's distributor in the Gulf.

"We are consistently focused on Scania's innovative design, performance, and reliability, as well as our ability to increase our customers long term profitability," said Sheldon Murdock, Sales Manager, Marine, Scania. "We combine this with excellent customer service and parts availability."

Denet Towing embodies much of the change sweeping the workboat market today.

With 11 boats and 30 employees, companies such as Denet are squeezed mightily by larger competitors with deeper pockets that have the ability to more comfortably absorb new, costly regulations, and to rationalize these investment costs across a fleet of hundreds.

Owners like Denet – a company which primarily serves the needs of the shallow-water oil drilling industry – must invest wisely or perish.

"This industry has changed a lot (in the last 30 years), and you have to be more competitive you're your pricing," said Denet. "From a selling point, I can go and sell more horsepower for less money. The boat that I have with the Scania engines is the most economical choice." The 65-ft. Lugger Tug M/V Ocean Pride was built by Rodriguez Ship Builders in Bayou Labatre, AL, in January 1998, powered by a Detroit Diesel 12V71. It was repowered three months ago, and another of Denet's Lugger Tugs is scheduled to be repowered by the end of 2014.

"From a selling point, I can go and sell more horsepower for less money. The boat that I have with the Scania engines is the most economical choice."

Jerrold Denet, Owner, Denet Towing in Boothville, La.

The results to date have been outstanding according to Denet, saving four to five gallons per hour, or 120 gallons and nearly $400 per day.

"We picked the Scania engines because of the fuel consumption savings, and for EPA reasons," said Denet. Another big factor was the fact that it was an In Line engine, giving the boat lower torque.

"We cater to oil field in shallow waters, and the low torque helps us move more efficiently through shallow areas," said Denet.

"So we're producing more power, it has more torque, and it is turbocharged instead of naturally aspirated, giving more power with less fuel."

As the Scania name is still a relatively new one in North American workboat circles, the company has come to the market with the goal of being a leader by providing the most innovative products and services available, and focusing on long term business partnerships. That said, Murdock does admit that "It has been a challenge to be seen as an unknown brand in the North American market, but globally Scania has seen that good results are a matter of implementing the correct methods."

While Denet stressed the importance of price – and he was specific to mention that in the hunt for new power, the Scania units provided equivalent power with better fuel consumption for nearly half the price of other offers – he stressed too that the long-term relationship with the engine maker is dependent largely on the company's ability to efficiently service and fix any problems that may arise.

With six Lugger Tugs and five Fast Runners, Denet Towing doesn't have the capacity for extended work stoppages.

Looking ahead, Murdock of Scania sees ample opportunity to serve boat owners of every size and locale: "In our displacement and output range, EPA Tier 3 went into effect on January 1, 2014," said Murdock. "We saw a decline in both new construction and repowering markets directly after the new emission standards went into effect, as it seemed many customers tried to finish projects prior to the new legislation. In the previous quarter we have seen increased demand and business has been going very well. We expect to see steady growth in 2015."

Greg Trauthwein

Eltorque Pushes into U.S. Maritime Market

Eltorque, a Norwegian manufacturer of electric valve actuators, has experienced strong growth in the last few years, positioning itself as a leading supplier to the OSV and fishery segments in Europe, Asia and in part, Brazil. As the U.S. shipbuilding backlog continues to grow, so too does interest from global product, system and service providers, and Eltorque is now gearing up to expand. “Local presence will be vital for our success,” said Arnstein Kjesbu, CEO. Increasingly shipyards and owners are now seeing the benefits of electric valve actuation, and over the last four years or so Eltorque has almost quadrupled its turnover.

Since the beginning in 1996, the company has developed a range of electric actuators, both quarter turn and multi turn, which are effectively helping to change the standard of valve control in mid- to high-end applications, especially in the Norwegian market.

Over the years, Eltorque has built an increasingly strong position in different international markets, and its reference list now includes more than 400 vessels, mainly including OSVs and fishing vessels. Eltorque offers a maintenance free solution with real time remote control and status feedback on valves. The electric actuators distinguish themselves by a high level of precision in the control of valves, and are easily configured in terms of torque, speed and turning angle.

With the additional possibility of serial bus connection, the need for cables and piping is dramatically reduced, while at the same time providing increased flexibility. The quarter turn actuators range from 250 Nm all the way up to 4000 Nm, and cover valve sizes between DN 50 and DN 800. Part of this range is also a newly developed 250 Nm explosion-proof actuator for EX areas.

The 50 and 150 Nm multi turn actuators cover a range of Rolls-Royce Marine’s multi-turn bilge and crossover valve manifolds from DN50 to DN150.

Building a Presence in the United States

The U.S. market represents a number of opportunities for Eltorque, according Kjesbu. “We`ve built a very strong position in the OSV segment, and with the way American shipyards are increasing their order backlog, the U.S. market seems to be the obvious choice for us to expand right now.

We are contemplating several growth strategies, but a strong local presence will be vital none the less.

The Eltorque electric valve control is more than just a single piece of hardware, and a complete technical perspective is important.

“Therefore a close dialog with the yards are important to us, and to secure that our customers have the necessary know-how.”

The OSV segment will be the main focus to start with, but fishing vessels and the merchant segment also represents an attractive potential for the Norwegian company.

AHTS Proves Strength on (in & through) Ice

While the large oceangoing variety of ships garners the lion's share of attention in regards to Arctic operations, modern offshore vessels that will be required to support potential oil and gas business in the region are equally vital. Viking Supply Ships recently carried out full scale ice trials in the Gulf of Bothnia on the Brage Viking, an 85m long anchor handling tug supply (AHTS) type offshore support vessel delivered from Zamakona shipyard in Spain two years ago.

The AHTS was built to Finnish-Swedish ice class 1A standards and is powered by a pair of MaK 8M32C 4,000kW and a pair of MaK 6M32C 3,000kW main engines, with a combined power output of 19,050 hp. The engines drive two nozzled CPP propellers supplied by Caterpillar Propulsion.

The Spanish-built vessel was put to the test in three areas with ice thickness ranging from 8 to 20 inches, and it showed that while it was not specifically designed for ice breaking duties, Brage Viking's performance in light to moderate ice conditions was at the same level as that of purpose-built Arctic supply icebreakers.

"We saw an opportunity to test Brage Viking to evaluate its performance in ice conditions and to demonstrate to customers, classification societies and flag state authorities its ability to operate safely in various types of ice," said Andreas Kjol, Viking's project director. "These tests were unique, and of special importance, because opportunities like this are quite limited. Generally it can be said the vessel's performance in the ice conditions encountered was somewhat better than predicted."

The tests included going ahead and astern in level ice and channels, turning circle tests and ice ridge penetration.

During the test the Brage Viking achieved a maximum speed ahead in level ice, with a 12-20-in. thickness, of 13.5 knots. Astern icebreaking also tested with good results.

The vessel has an open water bulbous bow which can break ice by bending ice upwards when a suitable bow draft is selected, and the tests showed that the vessel could penetrate typical ridges easily, while the bulbous bow could break ice running at operational speeds when the draft was correct.

"One of the things we learned from these tests was the correct operational drafts to optimize ice-breaking," said Kjol. "We also learned that if required, small modifications to the upper part of the bulbous bow would increase the draft range and the performance of the bulbous bow, especially in heavier ice conditions, without sacrificing performance in open water."

The bow of sister ship Loke Viking was modified after these tests.

Power for Ice Ops

The vessel's four main engines are connected via reduction gears to twin shaft CP-propellers. The twin rudders have a maximum turning angle of 70 degrees and can be operated separately. The lower side of the propeller nozzle and the rudders are installed about 35 in. below the hull bottom line and are attached to the hull by a fin support, reducing ice loads and propeller/nozzle ice interaction.

The tests showed that the vessel could make a clean channel and that, by turn-

Brage Viking: Zamakona built, Caterpillar MaK powered, Ice capable

ing the rudders in the opposite direction, the channel could be widened further. At a maximum speed of 13-14 knots the ship broke the ice field to a width of five to six times that of the vessel through its own wave pattern.

Maneuvering performance was rated as 'good,' and the vessel was able to also break out of its own channel backwards with rudders centered, just by changing the pitch of the inner curve propeller in an opposition direction.

As the nozzled propellers were located relatively deep down, with a good hull clearance, almost no propeller-ice interaction was noted.

"We needed to have more information about how the Brage Viking performed in ice, and to show to customers what she is capable of doing safely," said Kjol. "So this was a valuable exercise as we learned more about the scope for using this vessel for ice breaking duties; while the crew also learned a lot of about its behavior in ice."

Viking Ship Supply provides offshore support services in harsh environments, especially in Arctic regions, and the company is experienced operating in the Baltic, where for 14 years it has performed ice-breaking services for the Swedish government.

"Brage Viking handled the conditions found in the northern Baltic in February very well," said Kjol. "Operating as we do in remote regions, where a vessel can be three days from the nearest harbor, we need to have reliable equipment on board. The propulsion system in particular has to be extremely reliable as downtime in these circumstances is not an option." Viking Ship Supply now has two years of experience operating the Brage Viking, and in that time the MaK engines and Caterpillar Propulsion propellers have performed very well, with a high degree of reliability.

Kleven Orderbook Pumped Up with Deals from De Beers, Maersk

Norway's Kleven has enjoyed a strong Q3 with significant orders from Maersk and De Beers, bringing its order book to 18 vessels valued at $1.8 billion.

De Beers Marine Namibia, part of De Beers Group, signed a deal with Kleven to build a specialized vessel for deep water mineral exploration. While the MT 6022 design from Marin Teknikk is well proven in the offshore construction segment, this will be a first of its kind vessel and will include a wide range of tailor made equipment and features. "Underwater mineral exploration is a new segment for Kleven, and we look forward to working closely with De Beers on the realization of this highly advanced vessel," said Ståle Rasmussen, CEO of Kleven. "We have had a strong cooperation with Marin Teknikk for many years." The contract is divided into two separate phases, with final subject to building approval to be made Q1 2015. The vessel will be built at Kleven Verft in Ulsteinvik, Norway, and is to be delivered in June 2016.

Diamond Deal: De Beers Marine Namibia, part of De Beers Group, signed a deal with Kleven to build a specialized vessel for deep water mineral exploration.

Z-Drive Use Spreads on the U.S. Inland Waterways

Sneed built, Cummins powered, ZF driven

Enterprise Marine Services, a subsidiary of Enterprise Products Partners L.P., is making a major commitment to Z-Drives for the US inland waterways. They currently have four Z-Drive boats in service and have taken delivery of two new Z-Drive vessels from Sneed Shipbuilding in Texas with three more under construction. The new vessels, named Sheridan A and Terry H, were built by Sneed Shipbuilding, Inc., Channelview, TX. They measure 87 x 34 x 11.5 ft. and have a 34.8-in. eye level. They are powered with a pair of 1,000 hp. Cummins QSK 38M, Tier III, diesels coupled to Z-Drives from ZF Marine. A pair of 85 kW, Cummins QSB7 generators meets the electrical needs for the towboats. Tankage of these boats include: 30,000 gallons for fuel, 16,000 gallons for water and 500 gallons for lube oil. They are the first two of five similar boats being built for Enterprise by Sneed. Meantime, the John Bludworth Shipyard of Corpus Christi, Texas has already delivered the Freedom, Valor, the Jeris Authement and the MV Nolan Rhodes to Enterprise Marine Services.

These boats, designed by John L. Bludworth, III, are slightly different from the Sneed boats, measuring 86 x 34 x 11 ft. with a 34-ft. eye level wheelhouse view. A pair of Cummins 1,000 hp, K38-M II Tier III compliant diesels powered the first two boats and the last two were equipped with the QSK 38M, Tier III's. All of the vessels have identical ZF AT 5111 WM-FP, 1,000 bhp, ZF Marine Z-drives with 4.824:1 reduction gears. The drives are fitted with 65-in. (diameter) x 55-in. (pitch propellers mounted in Kort nozzles.) All of the new Enterprise Z-Drive boats will be tasked to push double-hulled 30,000 -barrel tank barges on the Inland Waterways and the Mississippi River. Additional equipment on all vessels includes two 40-ton Patterson deck winches, two Quincy 325 air compressors and full width fleet decks forward of the main deck house.

The Nolan Rhodes, from the John Bludworth yard, on the job for Enterprise Marine Services near Channelview Texas. Inset: Cummins engine and Z-drive on the Terry H.

(Photos by Jeff L. Yates courtesy of Cummins Marine)

(Photo: Maersk Supply Service)

Maersk Supply Service Orders Six Anchor Handlers.

Maersk Orders Six Anchor Handlers

Kleven was contracted by Maersk Supply Service to build six anchor handling tug supply vessels, with options for four additional newbuilds.

The vessels, all of Salt Ship Design's SALT 200 AHTS design, will be built at Kleven's two shipyards in Norway, Kleven Verft and Myklebust Verft, for deepwater operations for potential customers including international oil companies and construction companies worldwide.

The first six vessels are to be delivered between the fourth quarter of 2016 and the third quarter of 2017, the builder said. If all options are declared, the last vessel in the series is to be delivered in the first quarter of 2018.

"With the many advanced, high-end newbuildings being delivered over the years to come, we want our customers to remain confident that we are prepared to deliver on their demands and provide premium service in terms of reliability, safety and uptime," said Maersk Supply Service CEO, Carsten Plougmann Andersen.

"In our newbuilding project with Kleven, we have carefully designed the entire vessel with this in mind.

An example is the installation of the most fuel efficient and flexible hybrid propulsion system with fixed pitch on all side thrusters, providing high reliability and back-up system, good fuel economy, low emissions and excellent station keeping."

The new anchor handlers will measure 95 x 25m with an approximate 4,500 dwt. Boasting DP2, the vessels will have installed power of 23,000 bhp and offer a minimum bollard pull of 230 metric tons.

Crowley Christens Ocean Class Tug

Crowley Maritime christened the latest of its four tugboats in the ocean class series, Ocean Sun, which is the fourth DP2 tugboat to the company's ocean towing fleet. Ocean Sun is part of a feature-rich, four-vessel family of tugs designed to work with Crowley's new 455 series (400 x 105 ft.) high-deck strength barges. Crowley's ocean class tugs are outfitted for long-range, high-capacity ocean towing, rig moves, platform and floating production, storage and offloading (FPSO) unit tows, emergency response and firefighting. All four of the ocean class 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 designed combination of performance and fuel economy.

Photo: Crowley

Floating Production Systems

A Huge Market Opportunity for Shipyards, Marine Manufacturers

BY JIM MCCAUL, IMA WORLD ENERGY REPORTS

Floating production has been one of the most significant achievements in the upstream oil and gas industry over the past four decades. The ability to produce in deepwater has opened a new frontier in oil and gas development – and has generated a huge business base for suppliers of floating production systems

Types of Floating Production Systems

There are two basic types of floating production systems: oil/gas production units and LNG/gas processing units. Common to both is the use of a floating facility to support an oil and/or gas processing plant to monetize oil and/or gas deposits.

• **Floating oil/gas production systems:** These production systems are positioned on offshore fields and used to produce oil and gas contained in subsea reservoirs. Fluids and gas in the subsea reservoir are conveyed from the well-head to the production unit via flowlines, manifolds and risers. Specialized equipment mounted on the production unit and/or on the seabed is used to control well operations. Umbilicals connecting the production unit and well are used to monitor the well and power subsea systems. Production floaters come in a variety of shapes, sizes and productive capability. Some are shipshape (FPSOs), some rectangular (Production Semis, TLPs, Barges), some cylindrical (Spars, a few FPSOs). Storage capability is built into some units, others directly export produced fluids to shore via pipeline. Production capability ranges from <10,000 b/d to more than 250,000 b/d. Gas processing and export capability is fitted to some units, others have just oil production capability, with associated gas being re-injected, flared or used for topsides power. Currently 324 of these units are in operation, off-field/available or on order. Of the total, FPSOs account for 67%, Production Semis 15%, TLPs 9%, Spars 7% and Barges 3%. A related system is an FSO, which lacks production capability and is used for storage/offloading on offshore fields. Around 100 of these are currently in service.

• **Floating LNG/gas processing units**: These systems are used in the natural gas supply chain as LNG production or receiving/regasification facilities. They enable methane to be monetized when a land-based liquefaction plant is commercially infeasible and provide an attractive option to a land-based receiving/regasification terminal. FLNGs are designed to be positioned on gas fields offshore or at coastal locations near an onshore gas field. The production unit is fitted with cryogenic systems needed to transform natural gas to liquid form for ocean transport. They also have storage capability and can offload liquefied gas to LNG transport carriers. FSRUs are positioned in locations that require gas delivery. They are designed to receive LNG from transport carriers, store the product in cryogenic tanks and transform LNG back to gaseous state for delivery to consumers. The unit can be moored offshore with subsea pipeline connection to shore. Or it can be moored in port alongside a specially equipped jetty. There are currently 30 floating LNG/gas processing units in service or on order – 5 FLNGs and 25 FSRUs. All of the FLNGs are still on order. 13 of the FSRUs are in service, 12 on order.

(See Chart 1)

Four Decades of Industry Expansion

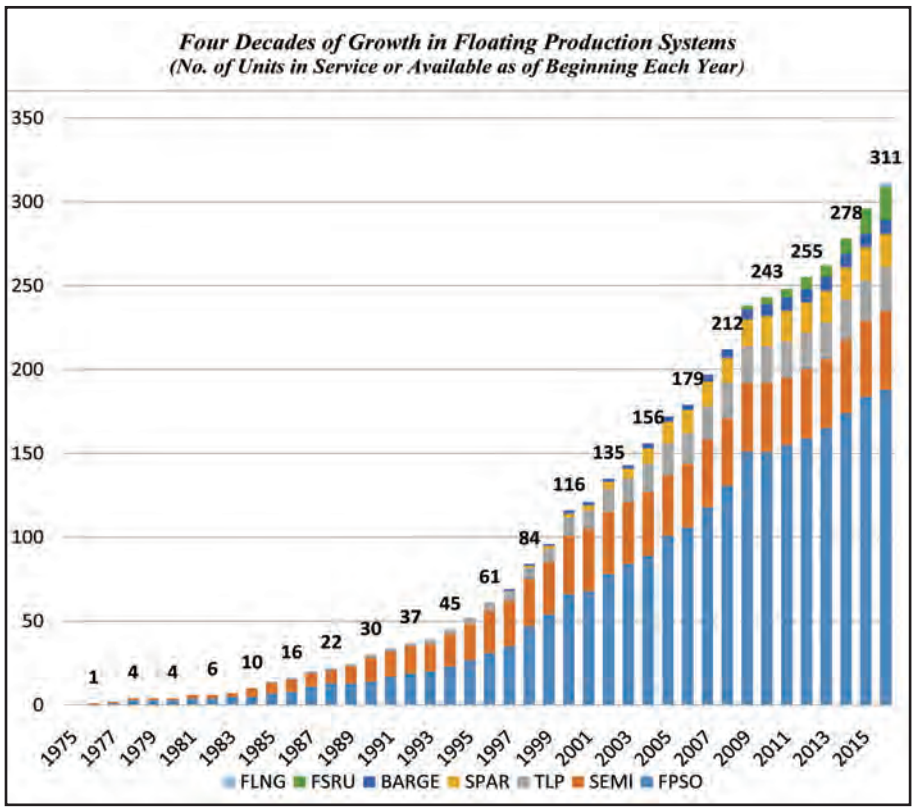
The history of floating production is short – only four decades. It dates from 40 years ago when Hamilton Brothers (now BHP) converted the semisubmersible drill rig Transworld 58 to the Argyll production semi and used the unit for ten years as a production facility in the UK North Sea. This was quickly followed by Shell, who in 1977 converted a tanker to the Castellon FPSO and used the unit for ten years as a production facility offshore

Chart 1

Number of Floating Production and Storage Units in Service, On Order and Available
(As of October 2014)

	Total	Active	On Order	Available
Oil/Gas Production				
FPSO	213	163	37	17
Production Barge	10	8	2	0
Production Semi	8	41	2	5
Production Spar	22	20	2	0
TLP	28	24	4	0
Total	324	256	47	22
LNG Processing				
FLNG	5	0	5	0
FSRU	25	13	12	0
Storage Systems				
FSO	102	93	8	1

Chart 2



Spain. Growth since the mid-1970s has been impressive, with the number of units in service steadily increasing. It took the first ten years to reach 15 units in operation. By the end of the second decade there were just over 50 units in operation. At the end of the third decade the number had grown to around 170 units in service. By the end of the fourth decade, at end 2015, the number will be around 310 units. There has not been a year in which the number of units in service declined – new deliveries have consistently exceeded the number of units decommissioned in the year.

(See Chart 2)

Where Systems are Being Built

East Asia is clearly the leading location for building production floaters. More than 35 production or storage units are under construction in Korea, China and Japan. Several huge projects are among the orders, including a massive FLNG being built in Korea.

South Asia is the dominant location for conversion of tankers into production and storage floaters. There are more than 15 conversion projects in progress in Singapore and Malaysia.

Brazil has increasingly become a major player in building production floaters. The topsides for more than 15 FPSOs are being fully or partially assembled and integrated in Brazilian facilities. Construction of 8 standardized FPSO hulls is also underway in a Brazilian shipyard, though some of the fabrication has been subcontracted in China.

Around 70% of the floating production systems now on order are destined for four major locations. 26% of the units on order are to be installed offshore Brazil, 19% off Northern Europe, 14% in SE Asia and 10% off West Africa.

Six units on order are being built on speculation and do not have an installation contract.

In the Planning Stage

There are currently more than 230 projects in the planning stage that will likely require a floating production system. Almost 80% of these projects are in five major regions -- West Africa, Brazil, Southeast Asia, Gulf of Mexico and Northern Europe.

Of the total planned projects, 28% are in water depth exceeding 1500 meters, 14% in 1000-1500 meters and 58% in water depth less than 1000 meters. Brazil, Africa and the Gulf of Mexico account for 90% of the ultra-deepwater projects in the planning stage.

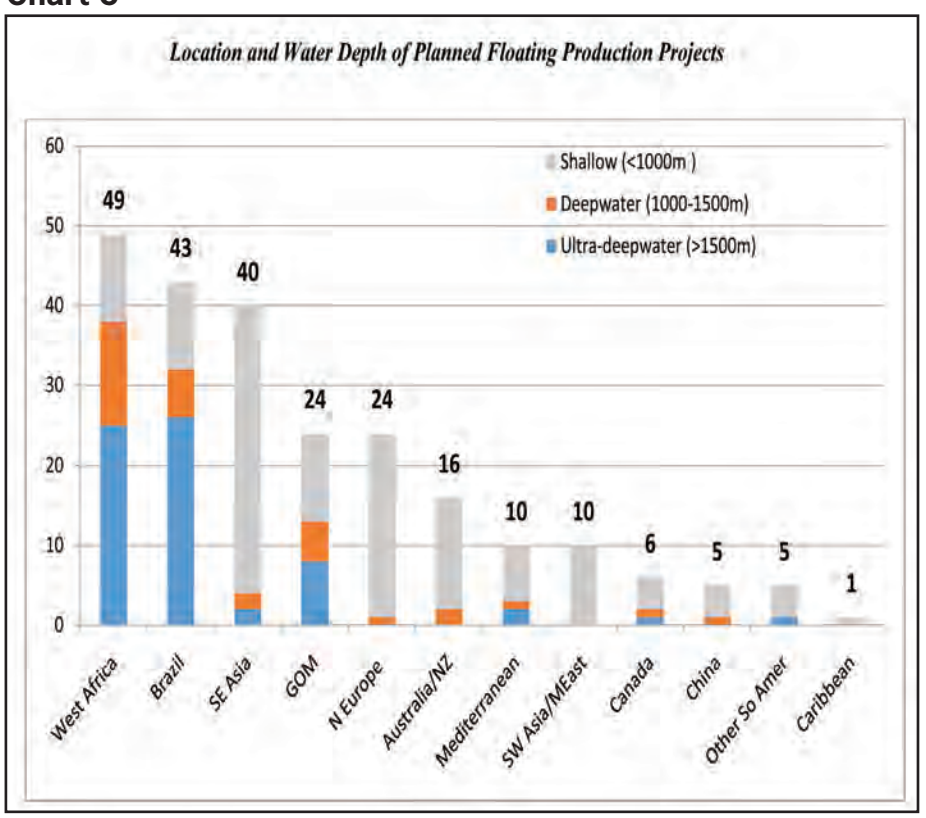
(See Chart 3)

New Report: Outlook for Orders

We have just completed a study of floating production system requirements through 2019. Depending on the underlying market conditions, **we are forecasting orders for 105 to 146 floating production systems over the next five years, with a contract value in the range of $112 to $150 billion.** FPSO construction and conversion will account for around 67% of the total expenditure. The balance will be in orders for other type oil/gas production floaters, floating liquefaction plants, LNG regasification units and storage/offloading vessels. Full details are provided in *Analysis of Future Business Drivers and Forecast of Floating Production System Orders Between 2015-2019*, a new 150-page report completed in October 2014. Find more information and ordering details at:

www.worldenergyreports.com

Chart 3



Special Vessels "Built by Flensburger"

BY PETER POSPIECH, GERMANY

Flensburger Schiffbau-Gesellschaft, FSG, was founded in 1872 by a group of five local ship owners who previously had all their steamboats built in England as most German ship owners did in the 19th century. The first ship, the iron tall ship Doris Brodersen, was delivered to one of the founding partners in 1875. The cargo steamer Septima was commissioned a year later. In 1892 a floating dock, with a capacity of 2,300 tons has been built. At the turn of the year 1900, more than 2c000 employees worked at FSG.

Since then "Flensburger" has constructed, built and sold more than 760 units of different types of cargo steamers and motor vessels and has also built sailing ships, barges, floating dry docks, tankers, fishing vessels, passenger ships, naval ships and even submarines.

During the past 14 years, it became a global market leader in building custom-made RoRo vessels. This position was further enforced with its latest order, when FSG was tasked to build the worldwide first RoRo Ferry, driven by natural gas, for the Australian SeaRoad shipping company.

Now, FSG concentrates for the past three years on the seminal offshore-market, and it was able to win international clients for building heavy lift vessels, seismic vessels and well intervention vessels.

***Raimon Strunck**, Vice President Sales, talks with* Maritime Reporter & Engineering News *German editor **Peter Pospiech**, about the positioning of the yard as well as the reason for the overtaking by the Norwegian company SIEM Industry.*

The first offshore seismic vessel, **MV Amazon Conqueror**, for the owner WesternGeco, during launching in June 2014

A closer look at the Flensburg-based shipbuilders

Mr. Strunck, please give us a short overview of your life and your career since you have been in your current position?

I was born 1965 in Dortmund, Germany. I hold a mechanical engineering degree from the Technical University of Hanover. After this I started my career as a project related engineer with Preussag group (now TUI), for whom I worked in several daughter companies, e. g. at Deutag on drilling rigs in Oman, Protec Feu S.A. in France, Noell Harbour -Technic and finally at HDW in the submarine division in 1995. Fascinated by the shipbuilding business I decided to stay. In 1997 they offered me the position as head of planning department at Lisnave Repair-Shipyard, Lisbon.

At this time my main focus was on reorganisation of the planning department and the relocation of the repair facilities from Lisbon to Setubal site. After two years in Portugal I went back to Germany and joined Flensburger Schiffbau-Gesellschaft. Under my project management the Flensburger delivered in total 26 RoRo and RoPax vessels until 2011. At this time I have been announced to be Vice President Sales at Flensburger Schiffbau-Gesellschaft.

"A vessel 'Built by Flensburger' is custom made."

Raimon Strunck, VP Sales, FSG

NOTICE OF AMENDING SCHEME MEETINGS

IN THE HIGH COURT OF JUSTICE
(IN ENGLAND AND WALES)
CHANCERY DIVISION
COMPANIES COURT

Claim Nos. 5812 and 5813 of 2014

IN THE MATTERS OF
OIC RUN-OFF LIMITED
(formerly Ralli Brothers Insurance Company Limited and The Orion Insurance Company plc)
- and -
THE LONDON AND OVERSEAS INSURANCE COMPANY LIMITED
(formerly Hull Underwriters' Association Limited and The London and Overseas Insurance Company plc)
(both subject to a scheme of arrangement)
- and -
IN THE MATTER OF THE COMPANIES ACT 2006

PROPOSED AMENDING SCHEME OF ARRANGEMENT

NOTICE IS HEREBY GIVEN that, by an order dated 8 October 2014 made in the above matters, the High Court of Justice of England and Wales (the "**Court**") has directed that meetings (the "**Amending Scheme Meetings**") be convened of the Scheme Creditors (as defined in the Original Scheme referred to below) of the above companies (the "**Companies**") at 10.30am (English time), on 11 December 2014 at PricewaterhouseCoopers LLP, 1 Embankment Place, London, WC2N 6RH, United Kingdom for the purpose of considering and, if thought fit, approving (with or without modification) the amending scheme of arrangement proposed to be made between the Companies and their respective Scheme Creditors pursuant to Part 26 of the Companies Act 2006 (the "**Amending Scheme**"), amending certain terms and provisions of the scheme of arrangement dated 20 November 1996 which became effective on 7 March 1997 between the Companies and their Scheme Creditors (the "**Original Scheme**").

The Court has ordered that each Company should convene three meetings of Scheme Creditors to vote on their respective Amending Scheme as follows:

(a) for Scheme Creditors who are Policyholders (other than Qualifying ILU Policyholders) with IBNR Liabilities and Notified Outstanding Liabilities;
(b) for Scheme Creditors who are Policyholders (other than Qualifying ILU Policyholders) with Scheme Liabilities (other than IBNR Liabilities and Notified Outstanding Liabilities), Dual Scheme Creditors and Ordinary Creditors; and
(c) for Scheme Creditors who are Qualifying ILU Policyholders,

(the terms "**Policyholders**", "**Qualifying ILU Policyholders**", "**IBNR Liabilities**", "**Notified Outstanding Liabilities**", "**Scheme Liabilities**", "**Dual Scheme Creditors**", "**Pre-1969 L&O Policyholders**", "**Ordinary Creditors**" each being as more particularly described in the Amending Explanatory Statement referred to below).

Depending on the type of its claim(s), a Scheme Creditor may be entitled to attend and vote at more than one of the Amending Scheme Meetings.

All Scheme Creditors are requested to attend the relevant Amending Scheme Meeting(s) at such time and place either in person or by proxy. Each Scheme Creditor will be required to register its attendance at the Amending Scheme Meetings. Registration will commence at 9.30am and Scheme Creditors are requested to arrive no later than 10.00am in order to register. The Chairman of the Amending Scheme Meetings will address Scheme Creditors generally on the Amending Scheme and on issues relevant to voting on the Amending Scheme at the commencement of the Amending Scheme Meetings.

Scheme Creditors may attend and vote in person (or, if a corporation, by a duly authorised representative) at the relevant Amending Scheme Meeting(s). Alternatively they may appoint another person, whether a Scheme Creditor or not, as their proxy to attend and vote in their place.

Copies of the proposed Amending Scheme, the explanatory statement required to be provided pursuant to section 897 of the Companies Act 2006 (the "**Amending Explanatory Statement**") and the voting and proxy forms for use at the Amending Scheme Meetings (each a "**Voting Form**" and together, the "**Voting Forms**") can be downloaded from www.oicrun-offltd.com. Alternatively, hard copies can be obtained, free of charge, by sending a request to the run-off manager of the Companies, Armour Risk Management Limited ("**Armour**") marked for the attention of Andrew Jones.

Armour's contact details are as follows:

By post: Armour Risk Management Limited, 4th Floor, 20 Old Broad Street, London, EC2N 1DP United Kingdom
By email: Oicclosurehelpdesk@armourrisk.com
By fax: +44 (0) 20 7382 2001
By phone: +44 (0) 20 7382 2020

Scheme Creditors are requested to return their completed and signed Voting Forms to Armour by post, email or fax at the above contact details by noon (English time) on 10 December 2014. Alternatively Scheme Creditors may hand their respective Voting Forms in at the registration desk prior to the Amending Scheme Meetings if attending in person or by proxy. However Scheme Creditors are urged to return the completed Voting Forms in advance of the Amending Scheme Meetings. Any Voting Form sent by fax or by email will not be accepted unless legible and the signed original Voting Form is subsequently received by Armour (marked for the attention of Andrew Jones) no later than 7 days after the Amending Scheme Meetings.

By the said order, the Court has appointed Dan Schwarzmann or, failing him, Paul Evans or such other independent person as the Scheme Administrators of the Companies may nominate, to act as Chairman of the Amending Scheme Meetings and has directed the Chairman to report the results of the Amending Scheme Meetings to the Court.

Any Scheme Creditor who is unclear about or has any question concerning the action it is required to take in order to vote on the Amending Scheme or who would like to discuss the way in which its claims data is likely to be evaluated under the Amending Scheme process, should contact Armour using the contact details set out above.

If approved by the requisite majorities of Scheme Creditors, the Amending Scheme will be subject to the subsequent approval of the Court.

Dated: 8 October 2014

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Ref: Joe Bannister/Will Beck
Solicitors to the Scheme Administrators

Aerial image of the **Flensburger Schiffbau-Gesellschaft** at the Flensburg Fjord in the North of Germany.

Many German as well as foreign shipyards disappeared during the last few years, but FSG has successfully defended its position in the market. What are the reasons for this FSG success model? How do you see the future of ship building in Germany, and what are the reasons for the overtaking - under the aspect of being so successful – by the Norwegian company Siem Industries?

We will build, also in the future, accurately according to the customer requirements. Beside this we want to be worldwide more known and position ourselves even more broadly. Our core business has been the RoRo segment, which we further developed with RoPax and ConRo as well as Navy transport vessels. This was complemented with highly specialized vessels of the offshore industry such as seismic research-,heavy lift or well intervention vessels just to name a few.

There exist many shipyards, but ours is different. Thanks to successful designs and innovative concepts we hold about 30 percent with the delivery of RoRo vessels – and with this we are world market leader. We guarantee a maximum of consulting from the very beginning. With our longstanding manufacturing experience and a network of European wide partners in the field of research and development, we help our potential customers from phase one onward. It is important for us to pick up ideas from our customers, develop them further and present solutions. This is true of all areas: whether we are talking about cargo concept, passenger sector, drive train or in the field of more untypical shipbuilding segments like load and unload simulation, on- and off-board logistic and routing optimization and of course the hydrodynamic optimization as well as seakeeping performance which is a very significant factor in the shipping and offshore business.

A vessel “Built by Flensburger is Custom Made.”

And what about Siem Industries?

All these mentioned factors have been very interesting for Siem Industries. The Norwegians are a globally operating corporation with diversified industrial interests, which can be main-

The Roll Dock ST-Class, MV RollDock Storm, is a multifunctional heavy lift, semi-submersible, dry cargo RoRo vessel, strengthened for heavy cargo.

ly found in five industrial areas: oil and gas services industry, ocean-transport of refrigerated cargoes and automobiles, potash-mining, finance and Swedish industries. The Siem Group of companies (including subsidiaries and affiliates) operates 145 vessels and owns a controlling interest in one of the most successful Off-shore Shipping Companies on a global scale (Siem Offshore) and the oil service company SubSea 7.

The proper foundation for the sustainable development and positive outlook for FSG was built, when Siem Offshore ordered two well-intervention-vessels at our yard, in February this year. Lastly, the international network of the new owner, speaks for the positive prospects coming along with this well thought-through and deliberate decision. In addition to this and this is very much important: we are really very glad that with this take over also all our long-standing employees will remain!

With the take-over, we expect that FSG gets further established and will hold a stronger position on the offshore-market. Siem Industries is a successful, globally ex-panding and financially strong family-owned enterprise. It allows us – the Flensburger Shipyard – to continue our successful developments in the global offshore-market."

Please describe your current order income?

To date the corporation has the following order-book: one RoPax Ferry for CMAL (Scotland), that will leave the yard in last week of October, a second seismic vessel for WesternGeco (England), two offshore-well-intervention-vessels for Siem Offshore (Norway) as well as an innovative Natural Gas based RoRo Ferry for SeaRoad (Australia). With these upcoming projects, FSG will be operating at full capacity until the 3rd quarter of 2016.

A final private question: how and where does Raimon Strunck relax?

I'm a positive thinking human being and enjoy life, particularly with my wife and my kids. Beside this: whenever I have time I go in for sports: run and row.

Danish Maritime Takes Center Stage

BY ERIC HAUN

The inaugural Danish Maritime Days was held with the goal of providing an open platform for a diverse range of industry stakeholders to collaboratively address some of the largest issues facing the maritime sector; but the event also showcased a resurging maritime nation asserting itself on the international radar.

From October 6-10, 2014, maritime stakeholders from across the globe convened in Denmark for the inaugural Danish Maritime Days (DMD), held via a public-private partnership between Danish Maritime, the Danish Maritime Authority and the Danish Shipowner's Association. Many of Denmark's top maritime leaders, technologies and initiatives were placed prominently on the world stage as the event was funded by some of the country's largest maritime players: the A.P. Møller Relief Foundation, the Danish Maritime Fund, the Hempel Foundation, the Lauritzen Foundation, the Danish Ministry of Business and Growth, D/S Orients Fond, D/S NORDEN and the Torm Foundation.

The weeklong DMD encompassed more than 50 industry events in Copenhagen and all through Denmark, including exhibitions, conferences, workshops, briefings, symposia, company visits, and numerous social events.

DMD's flagship event, the Danish Maritime Forum, was held at Docken (the dock), a former salt store house situated on the pier in the Copenhagen's Nordhavnen (North Harbor), which much like the Danish maritime industry itself is in the midst of a budding transformation toward sustainability.

In total, more than 200 attendees made up a "who's who" guest list, a list which included Denmark's Crown Prince

Frederik, IMO Secretary General Koji Sekimizu, international shipping and transport ministers and dozens of corporate leaders representing the industry's top companies. Elite industry stakeholders – from ship owners, operators, managers, builders, suppliers, politicians and regulators, to bankers, brokers and other investors – participated in collaborative workshops and debates centered on future maritime challenges – from Africa to the Arctic – as influential experts and decision-makers discussed various approaches to sustained maritime growth, development and profitability.

Director General of the Danish Maritime Authority Andreas Nordseth said, "I am proud that we have succeeded in gathering a wide range of top executives in the maritime industry for Danish Maritime Days and the Danish Maritime Forum. It shows that Blue Denmark can take the lead in the debate on the challenges of the future, and I look forward to even more good discussions and events next year."

Denmark on Display

Denmark holds a competitive position in the global maritime market, with solid growth records over the last 10 years. In all, about 100,000 Danes are employed in maritime professions, and according to Blue Denmark, the country is responsible for transporting 10% of world trade — approximately 1 billion metric tons annually. The Danish maritime industry includes some 1,000 maritime-related businesses, of which more than 150 were represented at the first ever Danish Maritime Fair in Copenhagen's Bella Center.

The exhibition from October 7-10 showcased a collection of well-established and newly emerging businesses, equipment and technologies from the Danish cluster.

Several large shipowners, including

The People

Denmark in early October 2014 was surely the place to 'see and be seen,' as the inaugural Danish Maritime Days attracted a "Who's Who" list of shipowners and dignitarties to Denmark. Pictured left, starting top left and proceeding clockwise are:

AP Moller-Mærsk CEO, Nils Andersen, delivered the keynote at the Danish Maritime Forum in Copenhagen where he offered several keys to enhancing the maritime sector on a worldwide scale.

Attendees at the Danish Maritime Forum participate in **"fireside chats."**

Denmark's Crown Prince Frederik at the Danish Maritime Forum.

IMO Secretary General Koji Sekimizu at the Danish Maritime Forum.

(All Photos: Danish Maritime Days)

Mærsk, Uni-Tankers, Clipper Group, Thome Ship Management and Weco Dannebrog Group, were represented along with various equipment suppliers, logistics companies, classification societies, schools and universities, technology developers and other shipping organizations and authorities. As displayed by the fair, Denmark maintains a presence in most maritime areas, including diesel engines, ballast water treatment systems, ship design, marine coatings, life-saving equipment, and a wide variety of additional maritime products and services.

(Green) Blue Denmark

Denmark is considered a leader in the development of environmentally friendly technologies, especially for engines and other propulsion technologies such as scrubbers. According to figures provided by Danish Maritime, 50% of the world's scrubbers are developed and produced in Denmark.

"Denmark focuses on research, development and innovation. Within the maritime industry, we are home to a range of globally leading businesses who are first movers," said Jenny N. Braat, managing director of Danish Maritime.

From scrubbers to ballast water treatment, Denmark's greenest solutions were on display during Danish Maritime Days, starting at the all-day event "Cleaner and more energy efficient shipping" on October 6, where delegates examined an array of approaches to a more environmentally friendly industry. The conference covered topics such as global warming and air pollution, current/future emissions regulations, and alternative fuels and technological solutions to lessen shipping's ecological impact.

The "First Movers in Safety, Green Solutions and Technologies – Possibilities and Challenges" seminar on October 9 focused on the implementation of green technologies and safety solutions, with regards to the practical, economic and legal challenges for technology providers and initial users, perhaps most clearly seen with ballast water treatment in particular – a technology for which Denmark is notably at the forefront.

Danish Maritime Days' focus on Danish leaders, trends and technologies combined with its effort toward collaboratively solving grand challenges in the maritime sector, helped the week to highlight key maritime issues that are being, or need to be, addressed – in Denmark and internationally. As the industry goes forward, the Danish sector will continue its role as an innovator, "first-mover", and important piece to the maritime puzzle.

- **Denmark to Nominate Nordseth** for IMO Secretary General: Danish Maritime Authority director, Andreas Nordseth, will be nominated by the Danish government to enter the election for the post of IMO Secretary General. It is expected that the election for the post of IMO Secretary-General will be printed in December 2014 and held in the IMO Council in June/July 2015. The post will become vacant on January 1, 2016.
- **Bawat BWTS Earns IMO Type Approval:** Bawat A/S said its ballast water treatment system has completed all IMO required tests, as verified by DNV GL. Bawat's equipment uses a unique in-tank recirculation solution that allows for operation while at sea, saving time and money when compared to in-line systems which require the vessel to be in port while treatment takes place. Bawat uses dexoygenation and pasteuri-

zation in a recirculation process, and its treatment process is initiated when the ship has left the ballasting position and is in voyage. Ballast water is pumped from just below the water surface in the ballast water tank through the Pasteurizing Unit where the ballast water is heated to a specified temperature (typically 72 °C). In the Retention Section it is held at this temperature for a specified period of time (typically 1 min.). The heating takes place in one or two plate heat exchangers and the heat is provided by surplus heat sources – e.g. main engine jacket cooling water or exhaust heat economizers through steam or thermal oil systems. In the regeneration section of the Pasteurizing Unit the out-going water is preheating the in-coming water resulting in a low Pasteurizing Unit ΔT (typically 4 – 6 °C). After pasteurization nitrogen under pressure is injected into the water flow. The nitrogen is release as mini bubbles at the BWTank bottom and through the surface of the bubbles the dissolved oxygen in the BW is replaced by nitrogen. The circulation is performed a specified number of times the exact number depending on the BWTank's construction.

The Technology

Denmark in early October 2014 was surely the place to see new marine technology, including (starting top left and proceeding clockwise):

Tuco Marine's new 11-meter wind farm service vessel.

(Image: Tuco Marine)

The **VIKING LifeCraft evacuation system** is hybrid liferaft/lifeboat.

(Photo: Eric Haun)

Alfa Laval Aalborg's new state-of-the-art test center.

(Photo: Alfa Laval Aalborg)

Hempel's HEMPAGUARD coating with patented ActiGuard technology is based on silicone-hydrogel and biocide science. *(Photo: Hempel)*

MAN Diesel & Turbo showcased its new MAN 175D engine at the newly updated engine test center in Frederikshavn.

(Photo: MAN Diesel & Turbo)

• **New Wind Farm Service Boat from Tuco:** Tuco Marine revealed its newest vessel in the ProZero series, the ProZero 11-m Wind Farm Service Boat, a little sister to the 13-m edition presented earlier this autumn. With this design, Tuco Marine said it targets the third round offshore service an accommodation vessels, serving the far offshore farms on deep waters where daily travel from site to shore is not feasible and workers are therefore accommodated on larger mother vessels or on accommodation platforms.

In San Diego grows a blooming, booming Blue Technology Cluster

BY NED LUNDQUIST

San Diego's "Blue Tech" cluster is making waves. And like a high tide, the powerful "Blue Economy" is raising a lot of boats.What is the "Blue Economy?" It has been defined as the sum of all economic activity having to do with oceans, seas, harbors, ports and coastal zones.

San Diego's "Blue Economy" includes a growing cluster of maritime-related companies and organizations across 16 industry sectors including fish farming, desalination and clean water technology, subsea exploration, biomedicine, defense, marine recreation and ocean observation. San Diego has a significant defense presence, particularly with the Navy and Marine Corps. There are major defense and academic research facilities such as the Navy's Space and Naval Warfare Command (SPAWAR), and the University of California – San Diego's Scripps Institution of Oceanography.

There are many factors that contribute to the success and cohesion of this commercial community. First and foremost is the ocean, itself. The cluster of both suppliers and customers mean that buyers, sellers and users are in close proximity with each other to facilitate collaboration. San Diego is an area with a number of world-class universities and research organizations, and has a deep pool of available and qualified talent.

Location, Location, Location

Marine technology companies, large and small, benefit from the Blue Tech cluster. San Diego-based SIDUS Solutions has 15 employees and sees itself as part of the Blue Tech Community.

According to Leonard Pool, managing director for SIDUS Solutions, being located in the San Diego Blue Tech community has real benefits. "San Diego is a unique community that has grown since the mid-50s to specialize in subsea applications, initially for military activities. It is due to this history, the available access to local community colleges, along with the coastal environment that we selected San Diego to be our home."

"The largest advantage is the ability to be close with our peers," Pool says, "and the ability to go surfing on the weekends."

SIDUS designs and manufactures security and surveillance systems for subsea and hazardous areas, and offers engineering and technical services for custom projects and integrated systems. SIDUS main office is located in San Diego, where all engineering and manufacturing are performed. "We also maintain a sales office in Houston Texas to help support our oil and gas customers. In addition we have a partnership with a company in the Netherlands," says Pool.

Defining the Blue Community

Michael Jones of The Maritime Alliance (TMA) in San Diego says we don't know just how big the ocean and maritime technology industries are in the U.S. TMA has worked with partners on several studies to understand BlueTech companies and organizations in San Diego and their importance to each other and the regional economy.

Jones said San Diego is not alone in studying and developing its Blue Economy. TMA is collaborating with a number of U.S. and international organizations to promote the Blue Economy and BlueTech including the Center for Scientific Research and Higher Education (CICSES) of Ensenada, Mexico; OceansAdvance Inc. in St. John's, Canada; the Maritime Innovative Territories International Network" (MiTiN) in Brest, France; and the University of Southern Mississippi.

In 2013, the U.S. Integrated Ocean Observing System (IOOS) program office at the National Oceanic and Atmospheric Administration (NOAA) contracted with ERISS Corporation to work with TMA on a multi-year study to articulate the economic impact of the ocean observation sector in the U.S.

According to Zdenka Willis, the U.S. IOOS program director, IOOS data and information fuels ocean industry with knowledge that determines business operations. "Shellfish growers rely on ocean acidification data to know when to take action to protect crops. Shipping companies check ocean currents, wave heights, and bridge clearance data to know when it is safe to deliver goods. This study will begin to quantify our economic benefits with facts, figures,

company names and more."

Observing Impact

According to Steve Talley, PhD, project manager for the ERISS study, the effort lies in looking at who is taking IOOS ocean observation data, adding value to it and/or using it to create a product. Talley said that many people use the datastream—from oil and gas companies planning deep ocean exploration to people creating windsurfing forecast smartphone applications—and don't even realize where it comes from.

"We want to learn about who is using the data, and what they are doing with it," said Talley. "We want to know what the barriers may be in the way of people making full use of the data, and if users know how to fully understand the data."

Tally says the assumption is that many people are using the IOOS data for economic benefit, and the study wants to determine the impact of that. "Who is using the data, and is it doing any good?"

Ocean observation is a sub-sector of Blue Tech, and includes manufacturers, service suppliers and intermediaries. These companies may not be exclusively working in ocean observation. There are big companies, but the majority have less than 20 employees.

"We want to get recognition of the impact of this 'cluster,' and show people that ocean observing is a huge economic boon to grow business to create revenue," Tally says.

"We also want to find out if we can help business expand if they were able to interact better with IOOS. We may need to educate people, and establish a training center," he says.

The project has taken off. What was originally going to be a three-year study is being compressed into two years because people are so anxious to see the results.

"We can't do a complete technical economic impact report. Our study is more of an economic profile. But it will be a very informative report," Tally says. "It may lead to a follow-on project." For information on the study:

http://www.usworks.com/usioos/

The Blue Voice

The Maritime Alliance was scheduled to host the ***6th Annual BlueTech & Blue Economy Summit and Tech Expo*** on Nov. 12-13 in San Diego to focus with public and private sector executives on an array of topics important to the growth of the Blue Economy.

The Summit will also examine coastal and marine spatial planning (CMSP) efforts to identify the best use of the ocean's resources. CMSP is a comprehensive, adaptive, integrated, ecosystem-based, and transparent planning process for current and projected uses of the maritime environment. It is based on sound science and integrates ecological, economic, and social information to inform management and regulatory decisions, reduce conflicts, and facilitate compatibility among projected uses, while sustaining the State's marine ecosystem and resources for present as well as future generations.

Safety is Job One

Maritime safety products and systems can entail everything from a sophisticated integrated bridge system down to cleaning products for the galley. Here are a few recent introductions that appear particularly topical in the never-ending push for safer ships and crews.

Free Fallin'

Under normal circumstances it would be hard to imagine a a mariner or rig worker who would want to be in the freefall lifeboat to the left, but in an emergency that blaze orange tube is likely the most beautiful ride at sea. Harding Safety announced last month that its FF1200 lifeboat pictured is the first on the market to receive a Statement of Compliance (SoC), issued by DNV GL, stating that this boat is in accordance with the new standard for lifeboats on the Norwegian shelf, DNV-OS-E406. The Statement of Compliance from DNV GL also confirms that the FF1200 meets the requirements of Statoil's extended standard for freefall lifeboats; GL0437.

Fire Protection Under a Waterfall

The need for fire protection on a vessel is no joking matter, not even for a vessel traversing the path of one of the highest water flows in the world.

The Niagara Falls tour boats are the stuff of legends, and when it came time to retire the iconic Maid of the Mist Niagara Falls tour boats, Hornblower Niagara Cruises went looking for replacements that would be ultra modern in performance and safety. With that it had a pair of 700-passenger, 86 ft. catamarans built by Hike Metal – christened Niagara Wonder and Niagara Thunder – to navigate the churning, rock-strewn waters 6,000 times a year. For fire protection Hornblower chose Sea-Fire's FireStop Detection System and H-Series Engineered Fire Suppression.

Custom designed, the integrated FireStop system continually monitors cylinder pressure, fire, heat, smoke and carbon monoxide and provides early warning notification. FireStop can automatically shut down engine and ventilation systems upon suppression discharge.

Water Cannon Virus Killer

Keeping a clean ship in terms of mechanical operaiton is one thing, and a wholly different matter when it comes to the health and welfare of crew.

The Water Cannon Pressure Washers is designed to deliver a wide swath of low pressure 180 degree F. hot or ambient

Photo: Sea-Fire Marine

Skip the flu shot, get a water cannon.

Image: Water Cannon

temperature water injected with 5.25% sodium hypochlorite (household bleach) and calcium hypochlorite (bleach powder). This application for 10 minutes on concrete, brick, stone or metal surfaces will kill viruses including influenza, the manufacturer claims.

Keeping the Cargo Hold Clean

When attention does turn back to keeping ship and systems clean, Wilhelmsen Ships Service (WSS) offers what it calls an upgraded cargo hold cleaning solution, combining cleaning agents and mobile equipment to help owners, operators and crews stay safe and compliant.

Increasingly, port turnaounds are faster and customers are demanding consistent cleaning regardless of location. WSS offers a solution that it believes will help, with cleaning products made for purpose and highly concentrated for more cost effective cleaning; equipment designed to be low-maintenance and durable. Best yet, it comes in a kit that includes everything the crew needs, and it is easy to assemble and ready to use.

The process of cargo hold cleaning is more regulated than ever, and cleaning agents discharged with waste water must be environmentally benign.

Cargo hold cleaning from WSS.

Radar, Camera in One

Earlier this year at SMM there was an avalanche of new system debuts, including the Kelvin Hughes new combined camera and radar Single Mast Solution (SMS), which is designed to be a rapidly deployable, all-weather, port and harbor security radar and multi-optioned electro-optical system. With a simple mounting interface the SMS is designed to be securely attached to any mast system – whether portable, vehicle-mounted or on a fixed structure. Fitted with the SharpEye SxV radar and integrated with a wide range of electro-optical sensors, the SMS is designed to suit many operational requirements. Additional mounted options include thermal imaging cameras, long range and/or low-light optical sensors and even searchlight or loud hailing systems.

SIMULATION

SUNY Maritime College

From Transas' 'Cloud' to You

As the market for simulation products continues to heat up globally, news from New York last month indicated a new level of automation, as the Navsim Services and Transas Americas Team won contracts for the supply of a combination of full mission, classroom and cloud based Transas Technical simulation (TechSim) solutions for the State University of New York (SUNY) Maritime College. The full mission and classroom systems are being procured to meet new United States Coast Guard (USCG) National Maritime Center (NMC) training requirements, and include multiple models from the Transas library with the latest functional capabilities of the Transas TechSim platform. The suite of simulators will be deployed in early 2015, with roll out of Cloud based simulation scheduled to go live soon after.

From the Cloud

Transas Cloud based simulation is a new offering that will deliver simulation solutions as a service (SaaS) via the Internet, to users who can be equipped with a potential variety of internet ready devices, using standard browsers, without the need for specific Transas software to be loaded on the client device. As the number of students taking simulation courses continues to increase in tandem with a limited number of supervised simulation class time available, SUNY Maritime College's objective is to use Transas Cloud based simulation to provide simulator access outside of the classroom setting, on demand, to ease the training burden. It is envisioned that initial online content will encompass course preparation tasks, familiarization, exercise and exam preparation, with students able to take additional simulation time to ensure they fully comprehend all class modules.

ShoreTension Mooring System

A four-way partnership between ShoreTension BV, Hoenderop BV, Gleistein Ropes and DSM Dyneema BV delivers the ShoreTension stand-alone vessel mooring system. At the heart of the system are 'MegaTwin Dyneema HS Dyneema SSC' lines produced by Geo Gleistein & Sohn GmbH. Both the load bearing cores and the snake skin cover of these lines are made with Dyneema fiber from DSM.

Ongoing scale increases in ship dimensions pose fundamental challenges for the safety of mooring and berth operations. Due to the increased lateral wind areas of, for example container vessels, car carriers and cruise vessels, high loads and load variations in the mooring lines can occur under severe wind conditions. A solution would be to pay out long breast lines or extra storm lines. For typical berths, however, the available space is limited as is the number and capacity of bollards.

The System

The ShoreTension system is designed as a stand-alone hydraulically controlled system. It is designed to absorb the energy of the moving ship in a gust of wind and store this internally while paying out line. When the peak loads are over, the system heaves in the line with the energy stored returning into its initial position. Therefore, it does not require any external energy, providing a sustainable mooring solution. The ShoreTension system can be tensioned from the shore and it can be set to a tensioning capacity of 60 tons. During the operation the tension is kept at a preset value and tension variations are kept

The system is designed as a stand-alone hydraulically controlled system. **It is designed to absorb the energy of the moving ship in a gust of wind and store this internally while paying out line.** When the peak loads are over, the system heaves in the line with the energy stored. It does not require any external energy.

to a minimum based on the continuous movements of the hydraulic cylinder. The functionality of the ShoreTension system can only be effective when the mooring lines, connecting the system with the vessel, are capable of efficiently and effectively transferring the loads over a prolonged period of time.

"When you use conventional mooring ropes, most of the tension is transferred to the ship," said Gert van den Burg of ShoreTension B.V. "With our system, the tension is transferred to the ShoreTension unit, which is located onshore. This does put additional pressure and wear on the mooring lines. Because of the exceptional demands of the system, mooring lines need to be both light and strong, with little or no stretch and durable. Mooring lines made with Dyneema can meet these demands given the properties of the fiber used and their proven value for mooring of VLCC's, LNG carriers and cruise lines for many years."

The load bearing core of the mooring lines connected with the ShoreTension system are exposed to constant loading over a prolonged period of time and potentially in areas with relatively high ambient temperatures. The characteristics of Dyneema SK78 enable to create light, strong and stiff mooring lines that provide a longer service life than generic High Modulus PolyEthylene (HMPE) fibers. There is an additional benefit: ropes with Dyneema come with no danger of backlash, or 'snaking', in the unlikely event of a rope break.

Also, the newly developed 'Snake Skin Cover' with Dyneema by Gleistein Ropes helps to protect the load bearing core during its use, thus mitigating the risk of premature line failure, while extending the ropes' lifetime.

In recent months, the Port of Rotterdam Authority supported use of ShoreTension by offering financial incentives for stevedores using this system.

Battle Tested

An example of the system's performance is the Autumn storm in Rotterdam on September 24, 2012. At 5 pm wind speeds reached up to gale force nine and hit the Northern part of the terminal abeam. The 366m MSC Cristina was moored at the terminal with heavy winds on her bow. In spite of her mooring equipment being in a good shape all efforts had to be made to keep her moored safely at her berth.

Because of the severe conditions that often occur at this terminal, several tests with the ShoreTension mooring system had been carried out here. Thanks to the cooperation between the ECT terminal and MSC, it was decided to connect two ShoreTension systems, equaling 120 tons of mooring force, to the ship's bow and stern as an addition to her own mooring. The connection was quickly established with the mooring lines with a minimum break load of 200 ton which were supplied from the shore. Subsequently the vessel was pulled back into the fenders and terminal operations could continue at 6:30 pm.

The vessel continued her service the next morning at 2 am.

"I have never seen a ship with 14.000 containers being held so tightly at the quayside," said Ton Leenders, Operational manager for ECT, on seeing the system in action. "With a growing number of large vessels and with increasingly automated loading and unloading processes, quayside stability is rapidly becoming a critical success factor."

Heavy Duty Lifting

Safely, efficiently lifting and handling increasingly heavy loads takes a hefty dose of the latest heavy lift products and systems.

Image: Rolls-Royce

Launched in 2012, the Rolls-Royce dual draglink crane has already been delivered to Farstad Shipping's vessel Far Solitaire, one PSV under construction at Keppel Singmarine Brazil SA, as well as to four PSVs still under construction at Detroit Brasil shipyard, in Itajaì.

Rolls-Royce is a ubiquitous and growing force in all matters maritime, inching toward the one-stop-shop premise. It is particularly well known in the deck machinery sector, and it recently signed a deal with Detroit Chile SA to supply offshore cranes to nine PSVs under construction at Detroit Brasil Ltda. shipyard, in Itajaì, Brazil. The order includes nine ship sets of the dual draglink crane, making 18 cranes in total. The Guido Perla-designed vessels (pictured right) will enter service on an eight-year contract with Petrobras, operated by Starnav Serviços Marìtimos Ltda, a subsidiary of Detroit Chile.

Launched in 2012, the Rolls-Royce dual draglink crane has already been delivered to Farstad Shipping's vessel Far Solitaire, one PSV under construction at Keppel Singmarine Brazil SA, as well as to four PSVs still under construction at Detroit Brasil shipyard, in Itajaì.

Crane systems manufactured by the **JD Neuhaus** company can be supplied with Atex classifications EX II 2 GD IIA T4 / EX II 3 GD IIB T4, with increased spark protection also available for explosion level II C. All load lift, lower and traverse operations operate off a pneumatic air-line pressure of 85psi (6 bar), with optional hydraulic operating systems also available, eliminating the potential hazards and dangers associated with electrically powered equipment when operating within areas of high dust or humidity.

The JDN range covers both single and double girder overhead traveling cranes, together with slewing jib cranes and underslung cranes incorporating purpose designed low headroom hoist trolley designs. Cranes with individual hoists having load capacities up to 100 metric tons can be supplied, as well as multiple hoist crane products operating with single or twin parallel beams, while also providing individual or synchronized hoist control systems.

For offshore lifting operations, including on sea going vessels, cranes can be supplied with rack and pinion drive systems for safe operation even in bad weather conditions. Super-silent operation is combined with sensitive controls including an automatic safety function

Image: Rolls-Royce

for load-lowering in the event of power supply failure. Specialist products for the oil and gas industry include an 80 metric ton double girder overhead travelling design for 'xmas tree' handling on a semi-submersible rig. Another purpose-designed product provided a 200 metric ton lift capacity for handling BOP equipment offshore. Cranes for use in the corrosive atmospheres of the galvanic industry have also been supplied.

MacGregor signed a series of deck machinery orders for 12 vessels with Sinopacific Shipbuilding Group. The equipment orders are for two vessel types, anchor handling tug supply (AHTS) vessels and platform supply vessels (PSVs), and they include MacGregor anchor handling/towing winches, shark jaws, towing pins and other deck machinery. Equipment deliveries between January and October 2015 will include:

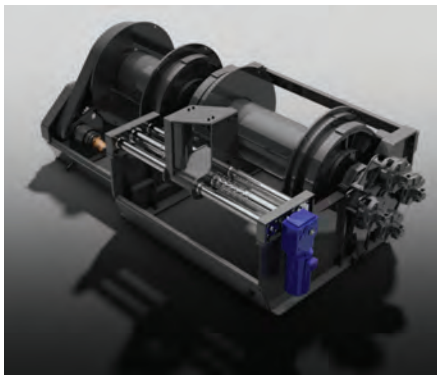
- Three 61.8m, 1,700 dwt PSVs being built to an SPP17A design for Mexican shipping company, Naviera Petrolera Integral S.A. de C.V. They will be used by PEMEX in the Gulf of Mexico;
- Four 64m, 60-metric-ton bollard pull AHTS vessels, being built to an SPA60 design for Singapore's Vallianz Holdings Limited, to serve Middle East, Latin American and Asia Pacific markets. Each shipset will include a 150-metric-ton line pull MacGregor anchor handling/towing winch, 200-metric-ton shark jaws and towing pins and other deck machinery;
- Two 81.75m, 4,000 dwt PSVs being built to an SPP35M design for Shenzhen Huawei Offshore Shipping Transport Co Ltd, a subsidiary of Shanghai Salvage Company in China; and
- Three 70.8m/85-metric-ton bollard pull AHTS vessels are being built to an SPA85L design for Shenzhen Huawei

The main dimensions of **SPA85L** have been optimized to meet the complex conditions of the South China Seas.

A customized, explosion protected 80 metric ton lift capacity crane as supplied by JD Neuhaus for use on an offshore rig.

MacGregor winches on an accommodation barge.

Markey winches for Bay Delta.



Rapp Marine for Western Towboat.

Rapp Marine for WHOI.

Offshore Shipping Transport.

MacGregor secured another significant offshore order, but this one was a bit different in that it is a winch package contract from Nam Cheong Limited group. Eight-point MacGregor mooring systems, with a 150-metric-ton line pull/270-metric-ton brake holding capacity, tugger winches and capstans have been specified for two new 500-person accommodation work barges being built at the yard. The 123-meter barges are scheduled for delivery in 2016, and when they are completele they are scheduled to enter service for one of the largest accommodation/work barge specialists in Asia, Perdana Petroleum Berhad.

Bay Delta Maritime commissioned a sixth Delta Class Tug built by Nichols Brothers Boat Builders. Designed by Jensen, M/V Delta Audrey is a 100 x 40-ft. Z-drive tractor tug powered by a pair of Caterpillar 3516C diesel engines coupled to the Rolls Royce propulsion package, a combined 6800 hp producing 93 tons of bollard pull. It features two **Markey** winches; one forward for ship assist and one aft for towing. The two winch suite includes the Markey Model DEPCF-52-75HP Class II Hawser Winch and the TES-40 Tow Winch. The DEPCF-52 has a drum capacity for up to 750 ft. of 9.5-in./10-in. soft-line and has a rated performance of 30,800 lbs. at 378 ft./min. Included in the package is the Markey Render/Recover feature that allows for hands free operation at up to full rated line-speeds and line-tension. The TES-40 is sized for up to 2800 ft. of 2.25-in. wire rope (26 x 48 x 76) with an air-controlled drum brake and drum disconnect clutch and an 18-in. diameter warping head. The TES-40 rated performance at barrel layer is 154,000 lbs. stall line-pull and 110,200 lbs. running line-pull at 20 ft./min.

Western Towboat Company chose **Rapp Marine U.S.** to build a custom towing winch for the new vessel Bering Titan. The main drum capacity for the winch is over 3200 ft. of 2.25-in. steel cable, with an additional 2700 ft. of 2-in. cable stored onto the smaller drum. The pull at the first layer is rated at 25 tons (Metric Tons). The Rapp four motor hydraulic drive is equipped with three speed steps, providing speed range from 30 m./min. up to 124 m./min.

On the east coast, Rapp scored a nice contract win providing the world-renowned Woods Hole Oceanographic Institution (WHOI) a CTD winch for the new research vessel R/V Alucia. Rapp's TBW-520E-T90 winch accommodates 7,000 m of .322 Rochester Fiber-Optic cable, plus 100 ft. of 2.25-in. synthetic tether. It has Active Heave Compensation (AHC) set for optimal use at 3000 meters of deployed line.

Staying underwater, divers often work alone in variable depth water pressures and temperatures, combined with poor visibility while also battling ocean currents. **JD Neuhaus** offers hoists with lift capacities from 550 lbs. up to 100 metric tons, with specialized units of 200 metric tons lift capacity having been supplied for BOP handling. The development of subsea hoists means that underwater as well as on-deck lifting operations for a wide range of operational, maintenance and repair functions can be undertaken on jack-up rigs, semi-submersible platforms, drill ships and FPSO vessels. The viability of JDN hoists was on display when its air operated hoists were used for the removal and replacement of a 50-ton rudder on a fully loaded bulk carrier. After a breakdown on a voyage from Brazil to China, the ship was first towed to a safe mooring off the coast of Venezuela, where the rudder removal and replacement work was undertaken. Three standard air operated JDN Profi 25 metric ton capacity hoists were used in conjunction for this operation, with these units being subject to full rebuild procedures after the job completion. The work was successfully undertaken at sea, without the need for cargo removal or transfer.

JD Neuhaus subsea hoists,

MHI Develops Deck Crane with Synchronized Control Functions

Mitsubishi Heavy Industries (MHI) completed delivery of the first three units of a 50-ton deck crane featuring a newly-developed synchronized control system, for a long-cargo transport ship constructed by Shin Kurushima Dockyard Co., Ltd. The synchronized control system of the three deck cranes enables safe and efficient loading and unloading of long cargo, playing a major role in the world's longest long-cargo transportation project.

The synchronized control system is designed to allow simultaneous and uniform control of three deck cranes by a single operator, for hoisting and jib elevation tasks. In addition to operations from the operator's cabin, operations can also be controlled remotely on deck. A (patent-pending) function that enables switching of the hook control reference position to either the hull or wharf is also provided. This function enables smooth cargo handling irrespective of the hull's inclination.

Besides the safety features provided on standard cranes, the new 50-ton deck cranes are equipped with precaution alarms by a buzzer and lamps depending on the applied load and an automatic stop function as an overload protection system. The new deck cranes also have a "deviation-overrun" function that halts operation when the deviation of the hook position or the jib angle between the three cranes exceeds its tolerance, as well as a function to provide operation priority to the controller of either the cabin or the deck.

Maintaining Control

Flexible Control for Winches and Cranes

Rexroth developed a new control solution it says is suitable for both simple and complex winch and crane drives. The control system is designed to easily be connected to a system using predefined interfaces. In the software, for example, the designer can access standardized modules for control functions. Integrated security features ensure compliance with the required safety level. The modular structure of the software makes using the control system flexible, in both simple and complex applications. The designer can freely choose the degree of networking, also in terms of security features, according to the specific application requirements.

The new control solution from Rexroth is designed to be quickly and easily implemented in winch and crane systems and affords the designer a high degree of flexibility.

(Image source: Weidmüller Interface GmbH & Co. KG)

Originally developed for mobile applications, the controller is designed especially for use in harsh environments, as it can withstand large temperature changes as well as vibrations and shocks. The control solution is also compact and can be installed space saving on deck.

Lifting Costa Concordia

Ropes made with Dyneema help Titan Salvage, Micoperi on historic salvage operation

The largest and most complex maritime salvage operation ever carried out was concluded this summer. The Costa Concordia parbuckling operation on the rocks of the Italian island of Giglio has been a success in many ways—not least for the objective to retrieve in one piece, such a massive vessel (117,000 tons) with minimal damage to the delicate marine environment on which it foundered.

High performance ropes with Dyneema played a key role in the operation.

DSM Dyneema has been supplying UHMWPE fiber, branded as Dyneema for ropes used in tug and salvage operations for almost 15 years. Ropes made with Dyneema have been used to pull stricken ships stranded in shallow waters, as well as oil platforms damaged in hurricanes, to safety all around the world. But the Costa Concordia project was probably the company's most critical—certainly its most high-profile—salvage project to date.

DSM Dyneema's strategy is to enable large and complex jobs to be carried out with increased safety and reliability, said Kedar Sule, Global Marketing Manager at DSM Dyneema, and the Costa Concordia salvage operation is the ultimate example of this strategy working in practice. "This is the biggest salvage operation carried out by anybody, anywhere," said Sule. "Never before has a ship of this size been salvaged in one piece. Normally wrecks are cut up and the pieces are then removed, but that was not an option in this case due to the location and its environmental sensitivity."

Steel wire rope remains the most commonly used product in salvage operations, followed by polyester rope. High modulus polyethylene (HMPE), accounts for a small portion of the market, but its importance in critical and environmentally critical operations is being increasingly recognized. For the Costa Concordia salvage operation, Titan Salvage and Micoperi ruled out the use of steel because of the high risk of damage it would cause to the sea floor, and to reduce the total weight of the parbuckling system.

"Many tug operators trust and use Dyneema," said Sule. "We think its successful use in the Costa Concordia operation will reinforce the trust in our fiber."

Minimizing Environmental Impact

Titan-Micoperi realized early on that any ropes required for the creation of the holdback system, to hold the wreck in place and then help bring it upright, would rub along the sea floor. As is well known, the Costa Concordia went aground in an area of great natural beauty where the underwater ecosystem is very precious. So it was imperative that any further damage to the ecosystem, beyond that caused by the ship itself running aground, be kept to a minimum. For this reason, the decision was made to go for a rope system that is not only extremely strong, but also very light and easy to handle. As Dyneema has neutral buoyancy in water, the ropes are easy to pull through the water by divers. Nick Sloane, the salvage master for the project, estimates that installation of the ropes, including pulling into position and connections at each end, saved around two weeks compared to if steel ropes had been used.

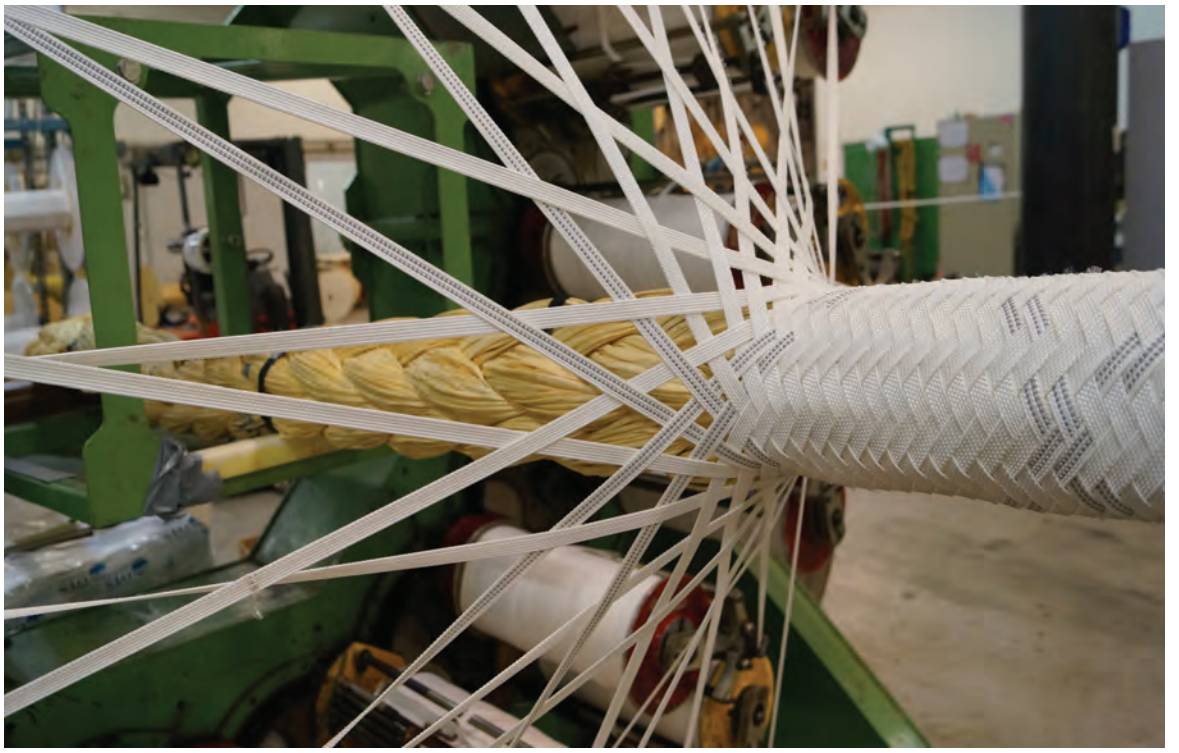
During the installation process, the ropes with Dyneema did indeed not drag along the seabed as steel ropes would have done. Nevertheless, since they are in constant contact along much of their length with the hull of the ship, they need surface protection, which is why Dextron 12 Plus ropes with patented protective jackets from leading Norwegian rope maker Offshore and Trawl Supply (OTS) were chosen. "With this solution, the rope cores are kept safer, as is the local ecosystem," said Sule. The covers for the Costa Concordia project contain a reflective additive so that they can easily be seen by divers working with torches in the dark.

The Costa Concordia operation provided OTS with its largest single order. For the Costa Concordia project, core and jacket are made in two different grades of Dyneema.

Vebjørn Løviknes, Sales and Marketing Manager at OTS, said the OTS Protective Jacket "is probably the best synthetic protective cover for HMPE ropes in the market today."

In all, there were 22 Dextron 12 Plus ropes holding the Costa Concordia, two running from each of the 11 towers mounted on the sea floor along the starboard (shore-side) side of the ship and connecting to chains that run under the

Dextron 12 Plus ropes made with Dyneema fiber. To protect the ropes from constant contact with the hull, they had patented protective jackets from Offshore and Trawl Supply (OTS).



hull and which are attached to the far (port) side. All the ropes have the same diameter, but each has a different length, of between 40 and 55m.

"Most of the work for DSM Dyneema was in the run-up to the production of the ropes," said Sule. "None of us had been involved before in an operation of this scale, and we only had one chance to get it right. With this support, OTS was able to determine the construction, length and size of ropes needed to withstand the massive forces that would come into play during the holding and parbuckling operations. OTS was able to manufacture exact lengths of the ropes with great precision."

Containing the Creep

This may sound relatively simple, it is not. The mechanism in each tower for pulling the ropes during the parbuckling operation does not involve winding the ropes around a mandrel, but rather a long hydraulic cylinder exerting a pull in a single stroke. This means that there was no room for any slack in the ropes to be taken up. Furthermore, since the ropes were to be loaded for a prolonged period of time, creep had to be considered.

Creep is a phenomenon that occurs very slowly, but in the Costa Concordia salvage operation creep was going to be measurable over the several months that the ropes were holding the ship in place, and so it needed to be calculated in advance. Even though creep is a well-known phenomenon, it is complex to predict, since it depends on multiple parameters. However, DSM Dyneema has developed a model that can accurately predict this irreversible elongation over the period of the salvage operation.

Marc Eijssen, Senior Application Manager, Offshore & Industrial at DSM Dyneema, said the company carried out a series of creep evaluations using its in-house model to predict creep under a variety of load and temperature scenarios. Based on these models, Titan-Micoperi and OTS were able to calculate the exact length needed for each rope. As is clear to see, the model proved accurate, and the parbuckling operation went exactly according to plan.

"We are used to dealing with major projects, even if nothing compares to the scale of this particular operation," said Eijssen. "We have a lot of experience in marine applications and many salvage companies are used to working with Dyneema, and they provide us with important feedback. But each case has its own specific requirements. We rely on our years of experience and technical expertise and strong partnerships to provide the right solution in each specific case."

"OTS was required to produce ropes with a breaking load of 1,100 tons," Eijssen said. "When the parbuckling operation was carried out in September, the vessel had been stuck on the rocks for 20 months, during which time its structure could have seriously deteriorated. We couldn't have it breaking up during the parbuckling operation, so each line had to fully contribute to avoid any chance of other lines being overloaded."

As already indicated, safeguarding the subsea environment was crucial to the total salvage operation. Said Eijssen, "Titan-Micoperi had originally considered constructing the holdback system using steel rope, despite its weight and handling disadvantages, and when its people saw early concepts from OTS based on Dyneema, they weren't convinced that a Dyneema solution would work.

But following discussions with OTS at a salvage conference, they became convinced that ropes with a patented protective cover to protect the load-bearing core were the way to go." At this point, OTS informed Nick Sloane that DSM Dyneema were ready and willing to provide full support for the project.

Sloane has in fact worked with ropes made with Dyneema for over 10 years.

"I personally find it an ideal component for salvage intervention," he said. "The lines with Dyneema were under the 'shadow' of the Costa Concordia, as she lay on her starboard side. The seabed slope and uneven terrain meant we required something light and that would not snag on the seabed - and that could be installed by a diver intervention to the turn of the Con-

Titan-Micoperi realized early on that any ropes required for the creation of the holdback system, to hold the wreck in place and then help bring it upright, would rub along the sea floor. It was imperative that any further damage to the ecosystem, beyond that caused by the ship itself running aground, be kept to a minimum. **For this reason, the decision was made to go for a rope system that is not only extremely strong, but also very light and easy to handle.**

cordia bilge."

"We preloaded the ropes to 500 tons each in a complete system test. On the actual day of the parbuckling, the forces required to hold the keel of the ship in position were limited to around 170 to 200 tons, to allow for slight shock-loads to be absorbed by the system through the operation."

After the parbuckling phase was completed, the ropes were kept attached to the wreck to hold it in position while sponsons were attached to the starboard side before it is refloated and then removed from Giglio.

"We have a live monitoring of the loads in play on each hold-back component," Sloane said. "We 'swim' the hold-back system with an ROV every 10 days to inspect the systems, but to date the loads have remained reasonably static and the system continues to work."

"The choice of the ropes with Dyneema, along with the OTS abrasive resistant outer protection coat, has resulted in a system that met our needs exactly on a very vital part of the parbuckling operation. The performance allowed us to carry out the operation without having to worry about a failure of the holdback system, and focus on the offshore side of the parbuckling components which required continual monitoring and adjustments."

RV Sikuliaq:
Modern Electric Propulsion & Power Management

While ships have used electricity to help power vessels for a long time, new and sophisticated diesel-electric technologies are making serious gains in efficiency, noise and environmental impact, and is becoming the propulsion system of choice for some high profile names.

A recent case is the diesel-electric powered, RV Sikuliaq (pronounced "see-koo-lee-auk," an Inupiaq term meaning "young sea ice."), a vessel embarking on a lifetime of studies in the polar sea region, including examining the effects of climate change and increased human presence in the Arctic.

Sikuliaq is one of the newest addition to the U.S. academic fleet, and the 261-ft.-long vessel will be home for 24 researchers and students who will live and work aboard the ship. It is a Global Class 5 vessel that can conduct research anywhere in the world. It is also designed for research in ice-choked waters. Among its myriad of capabilities are gathering sediment samples from the seafloor, hosting remotely operated vehicles and using instrumentation to study the water column – while having the capability to break through 2.5 ft. of ice.

Its diesel-electric propulsion system ensures the lowest possible environmental impact, including a low underwater radiated noise signature for marine mammal and fisheries studies.

Owned by the National Science Foundation and operated by the University of Alaska Fairbanks (UAF), Sikuliaq was funded by the American Recovery and Reinvestment Act of 2009 (ARRA). The primary coastal facility of the UAF School of Fisheries and Ocean Sciences, the Seward Marine Center is 130 miles south of Anchorage at the head of Resurrection Bay, and is considered its primary base of operation.

Diesel-Electric Vision Comes Together

There is a long-term and never-ending need for research vessels to study the world's oceans, particularly those able to traverse the treacherous Arctic waters. Through the years, various vessel design options were considered, and in 2004 Glosten Associates came up with the initial design of the Sikuliaq. Even then, the UAF and the architects knew the ship would be powered by a diesel-electric propulsion system because of its mandatory, minimal environmental impact and quiet operation.

At the earliest stages of planning, a state-of-the-art research vessel was envisioned, including the design of the diesel-electric propulsion system, said Siemens Marine Segment Director David Grucza. "We started working on the diesel-electric design in 2004, including one line diagrams, how to handle harmonics, designing the smallest component footprint and applying the equipment," Grucza said. "Our team in Alpharetta, Ga., helped design the Sikuliaq and execute the project and support startup and commissioning."

In December 2009, UAF awarded the shipyard contract to Marinette Marine and construction concluded in 2014. Marinette Marine is part of the Fincantieri Marine Group, a subsidiary of Fincantieri, one of Europe's largest shipbuilders with a history dating back

200 years and a track record of producing more than 7,000 ships. In 2014, the Sikuliaq began its maiden journey from the Wisconsin shipyard, through the Great Lakes-St. Lawrence Seaway transit system, through the Panama Canal and then to Alaska.

Integrated Propulsion System

Allan Pomeroy, Marinette Marine's senior buyer, has been an integral part of the construction of the ship – beginning with preliminary design, through construction and delivery. He is also responsible for the warranty of the ship. A shipbuilding veteran with 47 years of industry experience, Pomeroy's responsibility for the Sikuliaq goes from bow to stern, including the Siemens Blue Drive Plus C diesel-electric propulsion system, which was selected to meet the UAF's tough environmental and performance prerequisites. "Whenever you need a quiet and energy-efficient vessel you go to electric propulsion," Pomeroy said.

According to Siemens, the Blue Drive system stacks up favorably to alternative drive systems, significantly reducing NOx and greenhouse gases by up to 27%, reducing gas consumption between to 15-23%.

The components of the Blue Drive system include the Simatic PCS 7 monitoring and control system that keeps a watch on power management, as well as more than 4,000 operational points on the ship. Electrical power for the vessel is provided by four diesel generator sets – two MTU 16-cylinder 4000 engines driving 1,850 kW Kato generators, and two MTU 12 cylinder 4000 engines driving 1,380 kW generators. Any can be operated individually or in parallel.

The stern thrusters are ice pod type Z drives supplied by Wärtsilä and the bow thruster is an Elliott Gill water type jet. The Z drive propulsion allows the propeller to swivel 360 degrees horizontally, eliminating the need for a rudder. The port and starboard stern thrusters are each powered by a Siemens 2,875 kW

"If one piston stops putting out horsepower, we shut the engine down and find out why. That protects the engine. In the middle of the ocean, you don't want to damage it. You want to fix it."

Allan Pomeroy, Marinette Marine's Senior Buyer

The ship's power management capabilities, an integral part of the Blue Dive / PCS 7 control system, are designed to help keep the Sikuliaq and crew safe while operating in the Arctic environment.

AC motor and a Sinamics S120 variable speed drive (VFD). The bow thruster is powered by a 1,150 kW horsepower Siemens AC motor and another S120 VFD. A 24 pulse configuration on the two main propulsion VFDs eliminates virtually all harmonic distortion by adding a phase shift to the drives' transformers. This ensures that no dangerous harmonics will affect either the vessel or its sensitive research experiments.

Siemens S7 400 controllers, HMI and four, 690V switchboards take the power from the generators and communicate via hardwire and serial I/O.

Simatic touch panel HMI screens are located on the bridge, galley, captain's stateroom, chief engineer stateroom, powerhouse, and engineering control room. Step 7 software includes a historian function to accommodate the redundant controller configuration and deliver clear, intuitive information to the crew.

Power Management

The ship's power management capabilities, an integral part of the Blue Dive / PCS 7 control system, are designed to help keep the Sikuliaq and crew safe while operating in the Arctic environment. "If you lose one of the four generators when you are out to sea, it is not really a big problem," Pomeroy said. "The power management system ensures the load on each generator is less than 90 percent, but can go up to 110 percent for short periods of time. You cut back your loads to fall within the power that is generated from the other generators. If you lose another one or two, you have to cut your power back in order to stay within the power being generated by the plant because you don't want your entire plant to go dead," Pomeroy said.

The Sikuliaq's power management system monitors the online generator capacity as well as load consumption and automatically cuts back, or cascades, non-essential loads as needed.

"We go through the electrical loads on a ship and we rank them, priority one through 10. The lights in the storeroom are considered a priority 10," Pomeroy says. "The propulsion system and its auxiliaries are priority ones. Every load on the entire ship is prioritized. If the load is increasing and gets close to the capacity of the generator we knock the circuit breakers off in all the switchboards starting with non-essential priority 10 loads, followed by nine and eight and so on." Until we reach a safe generating capacity for the machines on-line at that time.

While the breakers are taken offline in a cascading priority, the power management system automatically shuts down the failing generator and starts the standby.

"The Siemens monitoring and control system monitors 250 points on the engines," Pomeroy says. "In a diesel engine you monitor every piston for temperature, pressure, overheating temperature, temperature of the exhaust and horsepower to make sure that each diesel is putting out the right amount of horsepower. If one piston stops putting out horsepower, we

shut the engine down and find out why. That protects the engine. In the middle of the ocean, you don't want to damage it. You want to fix it."

As the engine is shut down to prevent damage, the standby is automatically brought online. When it is up and online, and it sees it has a lot of power available, the engineer brings the circuit breakers online beginning with the top priorities and ending with priority 10 loads.

The captain and chief engineer are given enunciations every step of the way through the network of HMIs in the event of a cascading power reduction or any other event monitored by the system.

"Let's say we shut down the number three engine for low oil pressure, overheating, or loss of fluid. The captain and engineer are informed that the number four, or standby, engine is coming online. Then he is given another announcement that we have tripped off the number 10, nine and eight breakers. He is then informed when the number four engine has come up to speed and is generating the necessary voltage to achieve the proper 60 cycles."

When the power management system's load sharing function adjusts the load equally among all three generators, the cascaded circuit breakers that dropped off the switchboards are brought online. At this point, the captain and engineer are notified the condition has returned to normal.

"He is also reminded what started the event in the first place," Pomeroy says. "If it was low oil pressure in the number three generator he would be notified to check it out."

Sikuliaq has been approved to Unmanned Engine Room standards because of the automated power monitoring, control and alarming functions supplied by the Blue Drive system.

Meet SFFD's New Fireboat Technology

BY PETER ONG

Surrounded on three sides by water with the Pacific Ocean to the west, the Golden Gate Strait to the north, and San Francisco Bay to the East, the San Francisco Fire Department (SFFD) currently relies on two old and refurbished fireboats, the Phoenix (built in 1954) and the Guardian (built in 1951) to serve as fire protection assets for the waters around the City.

San Francisco requires fireboats for a wide range of protective coastal duties. Since San Francisco lies near a major earthquake fault line, a fireboat could serve as a pumper in the event of an earthquake where underground water mains may break and render hydrant water pressure useless. A fireboat could pump water straight from the coast to service fire engines inland and keep attack hoses supplied with adequate water pressure. A fireboat could also serve as a rescue craft for water-related emergency situations, or serve as protectors for container ships visiting the Port of Oakland, and for oil tanker ships delivering to the oil refineries in Richmond, the city above Oakland. San Francisco waters also have four steel and concrete bridges crossing to the north and eastern counties that see heavy daily traffic.

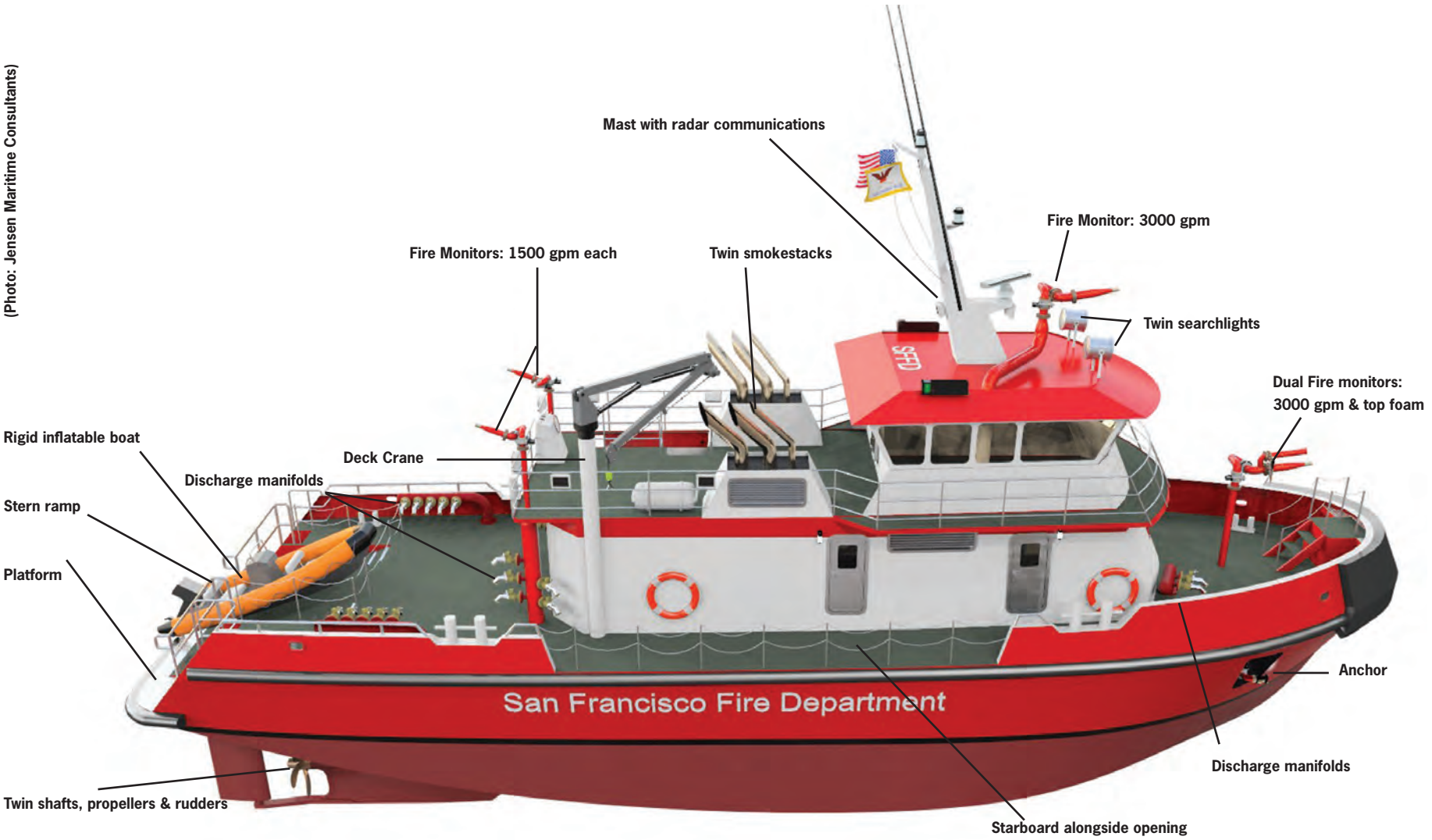
Jensen Maritime Consultants has won the award to design the new San Francisco fireboat, the first new fireboat for the City in over 50 years. The Phoenix was built in 1954 and the Guardian (built in 1951) was purchased used from the City of Vancouver, BC. The new fireboat will be a custom design, and the one thing that is really unusual about this boat is that it can pump 18,000gpm at 150psi, or it can pump 6,000gpm at 300psi and 6,000gpm at 15psi. Line attack hoses could attach to discharge manifolds on deck so the fireboat could serve as a pumping station in case of an earthquake where the water mains break underneath the street.

The new SFFD fireboat comes with unique design features and capabilities.

In particular, this design has five fire monitors: two dual monitors in front, one on the boathouse facing forward, and two on the corners of the second deck facing the rear. The Jensen design has twin searchlights mounted over the bridge's roof, a mast with radar and communications antennas, twin smokestacks canted towards the rear, a deck crane on the starboard side, port and starboard openings for coming alongside piers and jet skis, or for easier access for divers or for hauling in swimmers in distress or debris, and on the stern ramp a Rigid Inflatable Boat (RIB) with an outboard motor. The RIB in itself is a unique asset as it allows the SFFD to conduct inspections, ship boarding, and search and rescue operations independent from the new fireboat. To launch, the RIB slides down the stern ramp via gravity into the water. To retrieve the RIB, a winch mounted at the forward end of the pedestal hooks up to the RIB and hauls it aboard. (Both the Phoenix and Guardian carry motorized skiffs, but do not have stern ramps to launch or retrieve them).

Two sets of stairs flank the RIB ramp to lead to a platform at the stern for launching or retrieving materials or swimmers.

(Photo: Jensen Maritime Consultants)



The deck of the new Jensen-designed fireboat also has 24 vertical discharge manifolds to hook up line attack hoses for pumping to fires offshore.

A Chemical Biological Radiation Nuclear and Explosive (CBRNE) system allows firefighters to plug masks into the air system aboard the boat and breathe clean air during firefighting or Hazardous Materials situations. For pumping water, the new fireboat has three fire pumps. The two propulsion engines for sailing each have a water-driving fire pump mounted on the other end of the propulsion engine and there is one dedicated fire engine with a fire pump mounted on it. When sailing, the boat can pump 6,000gpm at 150psi by using the dedicated fire engine and pump only. At dockside, or when the propulsion engines are not being used for sailing, all of the engines (two propulsion and the dedicated fire engine) can be used to operate the fire pumps to produce 18,000gpm at 150psi. The engines also have a high-pressure mode where they can pump 6,000gpm at 150psi and 6,000gpm at 300psi. These incorporated features make the newest SFFD fireboat able to handle emergency situations that the older fireboats cannot. And with an inventory of now three fireboats, the San Francisco Fire Department could theoretically pump sea water inland on all three sides of the city in the event that major fires erupt in three different locations as a result from a devastating earthquake.

The new fireboat will have three interior decks: the top deck is the pilothouse; the main deck has a command center with a head (restroom) and an equipment storage room; and the bottom deck has a workshop, a storage room, an engine room, a steering gear room, and a forepeak storage space. The boat has no living or sleeping area, although it does have a Self-Contained Breathing Apparatus (SCBA) filling, storage, and distribution area where operators could plug into the stations locally on the boat's and breathe clean air when working onboard if necessary. The ship does not have a dedicated Decontamination (Shower) Room so a portable facility would be set up on deck or at the dock. The mast has a standard set of navigation lights and radar. The new fireboat will have a crew of three and four additional firefighters to either man the monitors or deploy from the RIB.

Estimated costs range from $9-$12 million dollars.

As of May 15, 2013, a $7.8 million Federal Grant was lost because the San Francisco Fire Department did not spend the money in the given time frame. The grant was awarded by the Federal Emergency Management Agency (FEMA) in 2009 to San Francisco for Port Security, namely the funding of a new fireboat in which the City would have to match the grant funds to pay for the rest of the fireboat's cost. The deal was that SFFD would have the boat built and in service in two-and-half years. Apparently, that didn't happen. The SFFD had to first pick a design and one of the bidders dropped out due to a disagreement of the process used to award the contract. So it took more months to get a new $400,000 contract established. When the first round of construction bids went out, the City rejected two of the bids. Therefore, a second round of bids went out in February 2013 with a winning selection of $12 million to build the new fireboat. However, the deadline to have the new fireboat in service and to secure the Federal Grant is at the end of June 2013, and with construction not even started, it will be impossible to build the new fireboat in time. Even lobbying by Senators Dianne Feinstein and Barbara Boxer, and House Minority Leader Nancy Pelosi, was not enough to save the FEMA Grant deal. SFFD hopes to apply again for another grant for the fireboat.

According to Mindy Talmadge, the Public Affairs Officer for the San Francisco Fire Department.

"The Department was unable to make use of the original award given a variety of delays in the project (You must understand that there are multiple agencies involved in the advertising, scoring and awarding of a bid that the Fire Department has absolutely no control over. It is that process that took the extensive time that made it impossible for the Fire Department to make use of the funds in the allocated time), and the funding was reallocated throughout the region to other projects. However, in August of 2013, the Department was the recipient of a new Federal grant award for the project. Currently, contract negotiations have begun on the contract for the construction of the boat, and the Department hopes to begin construction of the vessel in the coming months."

At the end of June 2014, "Jensen Maritime has been selected to provide detail production engineering and construction management for the production of one 88' x 25' Super Pumper NFPA Type II Fireboat for the San Francisco Fire Department. The fireboat contract-design was also completed by Jensen for the City of San Francisco in 2012. The vessel will be built at Vigor Industrial in Seattle and is expected to be completed during the late summer of 2015. The vessel will operate in San Francisco Bay, San Pablo Bay and the Pacific Ocean within five miles of shore and the adjoining inland waterways."

Specs for the new SFFD Fireboat

Designer	Jensen Maritime
Builder	Vigor (Seattle)
Length o.a., molded	88 ft.
Breadth, Molded	25 ft.
Depth, Molded	14.3 ft.
Draft, Molded (approx. Max Load)	9 ft.
Speed in Full Load Condition	11.5 knots (Predicted)
Propulsion	2 x Caterpillar C18 ACERT engines
Engine Horsepower (each)	2 x 493 bhp at 2300 rpm
Crew Complement	3 crew + 4 firefighters
Fire Engine	1 x Caterpillar C18 ACERT engine
Fire Pumps	3 x CounterFire ESF 300-550
Pump Capacity	18,000 gpm
Fuel Oil Capacity	10,900 gal. @ 95%
Fresh Water Capacity	250 gal. @ 100%
Fire Fighting Foam (FFF) Capacity	1,000 gal. @ 95%
Lube Oil Capacity	175 gal. @ 95%
Displacement, Full Load	260 LT (Estimated)

LNG AS FUEL

From left: Jensen's Dean Sahr, Manager, New Construction Projects and **Jonathan Smith**, Director, Construction Management, with Crowley's **Ray Martus**, Vice President, Construction Management; **Tucker Gilliam**, Vice President, Liner Services; **Patrick Sperry**, Manager, Construction Management; and **Cole Cosgrove**, Vice President, Operations.

Work Starts on LNG-Powered ConRos

VT Halter Marine commenced construction on the first of two liquefied natural gas (LNG)-powered, combination Container Roll-On/Roll-Off (ConRo) vessels for Crowley. The new ConRo vessel has been designed to maximize the carriage of 102-in.-wide containers. The vessel measures 219.5 x 32.3m wide, with a 10m draft and an approximate deadweight capacity of 26,500 metric tons. Cargo capacity will be approximately 2,400 TEUs, with additional space for nearly 400 vehicles. The main propulsion and auxiliary engines will be fueled with environmentally-friendly LNG. The vessels will be built at the Pascagoula facility, with deliveries scheduled for mid and late 2017. The ship design is provided by Wärtsilä Ship Design in conjunction with Crowley subsidiary Jensen Maritime, a Seattle-based naval architecture and marine engineering firm.

The Commitment Class, Jones Act ships will replace Crowley's towed triple-deck barge fleet, which has served the trade continuously and with distinction since the early 1970s. These new ships, which will be named El Coquí and Taíno, will offer customers fast ocean transit times, while accommodating the company's diverse equipment selection and cargo handling flexibility – benefits customers have enjoyed for nearly 60 years. El Coquí and Taíno are scheduled for delivery in the second and fourth quarter 2017, respectively.

Spirit of the Sound

Hybrid-Powered Research Vessel Christened

The Maritime Aquarium at Norwalk christened its new research vessel in September, a "green" research vessel designed to study the Long Island Sound. The $2.7m boat, Spirit of the Sound, was christened by the godmother of the boat, Astrid Heidenreich of Greenwich.

The boat is reported to be the first research vessel in the U.S. to run on hybrid-electric propulsion. Upon her launch in December, she will run virtually silently on electric power for the Aquarium's 2.5-hour public "study cruises" on Long Island Sound.

The 63-ft. all-aluminum catamaran will replace the Aquarium's 40-ft., 34-year-old diesel-powered trawler, R/V Oceanic. The new boat offers a climate-controlled indoor classroom and an outdoor research space. With more room inside and out, the new research vessel doubles the Aquarium's capacity for getting visitors out on the water – from 29 to 60 people per cruise.

R/V Spirit of the Sound's hybrid-electric propulsion system will reduce fuel consumption by an estimated 75%. The R/V Spirit of the Sound will be used for the Aquarium's public study cruises as well.

Designed by Incat Crowther of Australia, Spirit of the Sound was built at the Robert E. Derecktor Inc. shipyard in Mamaroneck, NY, with construction managed and integrated by Alternative Marine Technologies (Amtech). Its hybrid-electric propulsion system was made by BAE Systems Inc., Corvus Energy and Northern Lights Hybrid Marine. Fundraising and planning was led by Per Heidenreich, founder of Norwalk-based Heidmar, Inc., a commercial tanker operator. Committee member Robert Kunkel, president of Amtech, is serving as the Aquarium's project manager for the boat's construction.

Major contributors toward the new boat include: George and Carol Bauer of Wilton; The TK Foundation of Nassau, Bahamas; and the Per and Astrid Heidenreich Family Foundation of Greenwich. Bank of America agreed to sponsor the inaugural season for the new research vessel.

(Photo courtesy of the Maritime Aquarium at Norwalk)

Photos, starting left and rotating counter clockwise:

• The $2.7m environmentally friendly research vessel, Spirit of the Sound.

• Unveiling the Name: Research Vessel Spirit of the Sound by Aquarium staff, donors and supporters. From left, Cathy Hagadorn, aquarium educator; Per Heidenreich, donor; Robert Duff, state senator, Norwalk, Conn.; Harry Rilling, mayor, City of Norwalk; Carol Bauer, donor; and Astrid Heidenreich, donor.

• R/V Spirit of the Sound christened by her godmother Astrid Heidenreich on Friday, September 26, 2014. She is assisted by boat build project manager Robert Kunkel, Amtech.

Kleven Signs Modification Contract for Aker Wayfarer

Kleven's Myklebust Verft in Gursken, Norway, signed a contract for modification of the Aker Wayfarer vessel to become a deepwater subsea equipment support vessel (SESV). The contract is entered into with Ocean Yield ASA, a ship owning company with investments within oil service and industrial shipping. The vessel is under long term charter with AKOFS Offshore. At Myklebust Verft, the vessel will be modified in order to become a deepwater subsea equipment support vessel, allowing it to install and retrieve subsea trees and modules, including subsea structures and manifolds. "We acquired this dock two years ago, in order to facilitate service, repair and rebuilding of larger offshore vessels, just like Aker Wayfarer," said Ståle Rasmussen, CEO of Kleven. "Myklebust Verft's location, in the very heart of the maritime cluster at Sunnmøre, is a great advantage for all parties involved, and this project serves as a great example of local cooperation between Kleven, Vard and Rolls-Royce." Aker Wayfarer is designed by Vard Design, and delivered from Vard Søviknes in 2010. Rolls-Royce in Hjørungavåg will deliver the top-side equipment.

Austal Launches JHSV 5

In late September Austal USA launched Trenton (JHSV 5), the second Joint High Speed Vessel (JHSV) launched by Austal in 2014. This 103-m high-speed catamaran is part of a 10-ship program worth more than $1.6 billion. The launch of Trenton was conducted in a multi-step process that involved having Berard Transportation transfer the ship from Assembly Bay 3 onto a Crowley deck barge, which was then towed to BAE Systems Southeast Shipyard. The next day, Trenton was transferred onto BAE's drydock Alabama; it was floated then returned to Austal's facility where it will undergo final outfitting and activation before sea trials and delivery to the Navy in Spring 2015.

"It's amazing just how efficient this complex launch process has become," said Craig Perciavalle, Austal USA's president. JHSV 5 is now one of four Austal-built Navy ships moored in the Mobile River, joining USNS Fall River (JHSV 4), Montgomery (LCS 8) and Jackson (LCS 6). Austal has delivered four of 10 contracted JHSVs in two years to the Navy. Construction is well underway on Brunswick (JHSV 6) which will begin final assembly in, now vacant, Assembly Bay 3 in October, and construction began on Carson City (JHSV 7) earlier this month.

Photo courtesy of Austal USA


Cummings


Meissner


Tarabochia


Fuhrmann


Morley


Bangstein

Cummings Honored

Congressman Elijah E. Cummings (D-MD) delivered keynote remarks at APL Maritime's Senior Management Conference and received an award recognizing his service to the maritime industry. Cummings was honored for his continued support of the U.S. flagged fleet, especially during his tenure as Chairman of the Subcommittee on Coast Guard and Maritime Transportation of the House Transportation and Infrastructure Committee.

Meissner Promoted at ZF

The Industrial Technology division of the ZF Group said that **Martin Meissner** has assumed the position of Marketing and Communications Manager for North America. Meissner, currently the Marketing and Communications Manager for ZF's Marine business in North America, will now be responsible for all facets of marketing related activities in North America for the Industrial Technology division.

Madsen to Lead NCL

Norwegian Cruise Line Holdings said that **Drew Madsen** has joined the company as president and chief operating officer of Norwegian Cruise Line. He brings more than 30 years of leadership experience in the hospitality and consumer products industry, most recently as president and chief operating officer at Darden Restaurants, Inc.

EBDG Promotes Tarabochia

Elliott Bay Design Group hired **Peter Tarabochia** as its new Vice President, Chief Financial Officer. Tarabochia, formerly of Vigor Industrial, brings more than a decade of experience to his new role.

Svanevik Elected to Seadrill Board

Seadrill Limited announced that Carl Erik Steen has resigned from the board of directors with immediate effect. Filling the position is **Ørjan Svanevik**, who was appointed by the board of directors to fill the vacant position starting immediately.

Svanevik is an employee of the Seatankers Group and was previously managing director for the investment advisory firm, Oavik Capital.

Faststream Awards Fuhrmann

Faststream named **Chad Fuhrmann** the recipient of its inaugural Scholarship for Leadership Excellence. The scholarship, valued at $9,500, will afford Fuhrmann the opportunity to attend a continuing education program hosted by Louisiana State University's E.J. Ourso College of Business Stephenson Entrepreneurship Institute. Fuhrmann is the business director for the Americas at Maritime Assurance and Consulting, Ltd. (MAC), where he is responsible for all U.S. operations.

MPT Breaks Ground

Maritime Professional Training (MPT) said it selected Fort Lauderdale-based Gulf Building Corp. as the general contractor for the construction of its planned 25,000-square-foot facility expansion at its Fort Lauderdale campus. Said **Captain Ted Morley**, COO of Maritime Professional Training. "This expansion builds on our current SMART Campus simulation facility, bringing the latest technology for deck and engine room simulation to the industry."

Benhaddad Joins Tidewater

Tidewater Inc. said that **Latif Benhaddad** has joined Tidewater as VP of Engineering. Benhaddad is responsible for global engineering technical services, including fleet newbuild programs and fleet maintenance and repair. William Brown, the current VP of Engineering, announced his intent to retire in the next 12 months. Benhaddad will transition the role with Brown for a period of time.

DNV GL forms LNG Solutions Group

To meet the rapidly growing demand for a wide variety of LNG related services, DNV GL has established a group of LNG experts in North America. In addition to deep LNG expertise, the Houston-based "LNG Solutions Group - Americas" is also experienced in all business, risk and regulatory matters specific to the North American market, said **Bjørn-Harald Bangstein**, Director of Ops Maritime Advisory, Americas.

Jorgensen Named GAC UK MD

Herman Jorgensen, formerly General Manager at GAC Norway, has been appointed GAC UK's Managing Director.

Crowley Scholarships to Cal Maritime Students

Crowley Maritime Corporation presented four California Maritime Academy (Cal Maritime) students with **Thomas B. Crowley Sr.** Memorial scholarships during Containerization and Intermodal Institute's Connie Awards dinner in Long Beach, Calif. Crowley's Victoria Ellis, training specialist, presented the scholarships to the recipients, each of whom were selected for their strong academic records, leadership and financial needs. Recipient **Andrew Bahnsen**, a senior studying marine engineering technology at Cal Maritime, is originally from Battle Ground, Wash., and sailed with Crowley as a cadet last summer.

He said that the Thomas B. Crowley Sr. Memorial Scholarship alleviates some of his financial stress and will help him focus more on his upcoming U.S. Coast Guard exam.

Bonnie Claire Muchnick, a recipient from Oakland, Calif., is a junior studying marine transportation and hopes to sail with Crowley as a cadet. After graduation, she plans to go out to sea and eventually become a tug operator. Muchnick said that she is honored to receive the scholarship, especially because her busy course load makes it difficult to find time for a job.

Andrew Leonard, from Glendale, Ariz., is also a junior studying marine transportation. This past summer, he spent three months working aboard Crowley's articulated tug-barge (ATB) Integrity on a route from Texas to South Carolina. He is looking forward to pursuing a career at sea after he graduates next year.

Ryan Cazneaux, a senior from Mount Shasta, Calif., is also studying marine transportation. He sailed aboard a Roll-on/Roll-off (RO/RO) vessel managed by Crowley in Northern Europe for a summer and plans to move to the U.S. East Coast to work on ship assist tugs after graduation. Cazneaux said that the Crowley scholarship helps alleviate some of the financial burden on his family.


Crowley's Victoria Ellis presents the scholarship award to Bonnie Muchnick at the Connie Awards dinner in Long Beach, Calif.


(Photos: Crowley)

Marorka's Jensen

Brenton

Evans

Beck Jr.

St. Lawrence

Harper

He is based at the company's Grangemouth office, working alongside the company's finance and human resources functions.

Marorka Opens in Copenhagen

Marorka announced it is currently expanding following a substantial injection of funds. The expansion plan was approved and Marorka will extend its worldwide network in 2014. As a result, Marorka has opened Copenhagen offices in August 2014 and offices in Dubai and Athens will be strengthened by the end of 2014. The Singapore office will be in operation from November.

HII Appoints Brenton

Huntington Ingalls Industries (HII) announced that **Capt. Kevin Brenton** (U.S. Navy, Ret.) has joined the company as corporate director of customer affairs for submarine programs. Brenton served most recently as deputy director of the Navy's Strategic Systems Programs, overseeing strategic weapons systems.

Evans to Lead Goltens Houston

Goltens Worldwide opened its new full service facility in Houston, Texas, which was driven by the company's need to be closer to the expanding customer base in the U.S. Gulf. Goltens Houston will deliver the company's core diesel engine, in-situ machining and green technologies services portfolio, and it has a broad range of large-scale workshop machining equipment to support reconditioning and overhaul operations. Leading the operation is **Mark Evans**, GM, Goltens Houston.

Willard Marine Adds Two

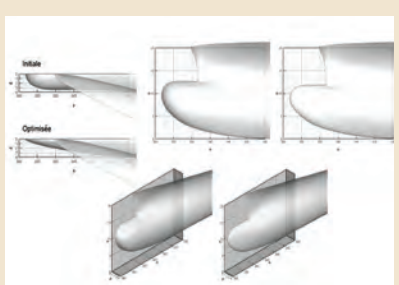
Willard Marine, Inc. (WMI), a manufacturer of composite and aluminum boats for 57 years, announced the appointments of **Bob Beck Jr.** and **Renée St. Lawrence** to its sales team. Beck joins the WMI Sales and Training team with more than 24 years of experience in the U.S. Coast Guard where he held several ranks and also acted as the Supervisor of Coast Guard Units managing personnel, budgets and maintenance contracts. St. Lawrence was Zodiac's Federal Sales and Contract Manager where she spearheaded a variety of contracts from initiation through product delivery.

Ingalls VP Harper Honored

Huntington Ingalls Industries (HII) announced that **Lori Harper**, vice president of supply chain management at the

CMA CGM to Refit 10 Bows

The CMA CGM Group will retrofit 10 of its vessels' bulbous bows to achieve improved energy efficiency for slow steaming. The modifications are in addition to the 15 CMA CGM ships that have already been retrofitted in 2013 and 2014. The bulbous bows exchanges, to be performed within a week in repair yards' drydocks, will reduce the ship's fuel consumption and cut CO2 emissions by improving the ships' wave resistance and hydrodynamic efficiency. They bows were initially designed for 24 knots sailing speed, but following the implementation of the slow steaming, the group's vessels now sail at speeds between 16-18 knots. Bulbous bows have therefore been redesigned in cooperation with Hydrocéan, a French engineering company specialized in hydrodynamics and which performed the hydrodynamic calculations. All vessels that have entered the CMA CGM fleet in 2014 are sailing with optimized bulbous bows.



Shapes comparison: initial bulbs (left) and new ones (right).

Source: Hydrocéan

company's Ingalls Shipbuilding division, was named one of the state's 50 Leading Business Women by Mississippi Business Journal. As vice president of supply chain management, Harper leads all of Ingalls' supply chain management functions, including sourcing, procurement, inventory control and material warehousing operations. She joined Ingalls in 2002 and has held leadership positions in multiple areas, including director of production control, material director for the LHD 8 and LPD 17 programs, supply chain compliance manager, and subcontracts section manager. Harper received a bachelor's degree in business administration from Southwestern Oklahoma State University and an MBA from William Carey College.

BMT Names McGlynn

BMT Group Ltd (BMT) appointed Ray McGlynn as Sales Manager for Offshore Oil and Gas. McGlynn will be responsible for European and African regional sales support and assisting Louise Ledgard, Offshore Oil and Gas Business Development Lead in supporting the coordination of ocean engineering sales across the BMT Group.

WSS Appoints Chin

Wilhelmsen Ships Service (WSS) appointed Jason Chin as Ships Agency Service Manager, Singapore. With more than 15 years' experience in the maritime and shipping industry, Chin will lead a team carrying out more than 3,700 ships agency services every year.

Avtron Industrial Automation is now Nidec Avtron Automation

The new Nidec Avtron Automation provides electric drive systems for newbuilds and retrofits, as well as AC and DC motors for propulsion, thrusters, cranes and winches. Nidec Avtron Automation is a leader and industry technology expert in the design and manufacture of high-reliability electric drive systems, motors and encoders for the marine industry. Its products are used for improving ship performance, diagnostics and reliability. Founded in 1973, Nidec is a $9 billion manufacturer and distributor of electric motors, drives, and systems.

Teekay Renews Hull and Propeller Monitoring for LNG Carriers

Teekay Corporation renewed its contract with Propulsion Dynamics for its hull and propeller performance monitoring system CASPER Service. The Computerized Analysis of Ship PERformance (CASPER Service) from Propulsion Dynamics is a turnkey subscription service that provides shipowners with decision support for technical and operational fuel efficiency programs. The two-year extension for the CASPER Service will cover 23 LNG carriers.

Norvestor: PG's Largest Shareholder

Norvestor VI, L.P., a fund advised by Norvestor Equity AS, announced it has signed an agreement to invest in Ing Per Gjerdrum AS including its subsidiaries PG Hydraulics AS and PG Construction AS. The transaction was expected to close end of October 2014, subject to customary approval from the Norwegian Competition Authorities. Following the acquisition, Norvestor will become the largest shareholder in PG with about 63 % of the shares, while the remaining shares will be held by Mads Gjerdrum and Roy Norum. The company had revenues of NOK 552 million in 2013.

Roy Norum, CEO of PG, said, "Our partnership with Norvestor marks the end of an era with Per Gjerdrum stepping back after 32 years with PG. Since I joined the company in 2000, we have together been able to profitably tenfold revenues working alongside some of the most admirable customers and suppliers in the industry. I am confident that we, through Norvestor, have found the ideal way of taking PG to the next level."

Navico Acquires MARIS

Navico Holding AS, parent company to the Simrad brand of navigational marine electronics, has reached an agreement to acquire MARIS (Maritime Information Systems A/S) from The Grieg Group. MARIS is a supplier of data solutions to the commercial maritime sector related to navigation, voyage optimization and voyage monitoring. With well more than 10,000 navigation systems delivered, MARIS is a supplier of ECDIS systems globally.

Stolt-Nielsen Staff Moving to Houston

Stolt-Nielsen Limited intends to relocate its tankers' staff in Norwalk, Connecticut to Houston, Texas. The move will consolidate the company's U.S.-based staff in Houston, which is the port most frequently called by the global Stolt Tankers fleet. Stolt Tank Containers' U.S.-based personnel and the company's largest wholly owned bulk liquid terminal are already located in Houston.

Photo: Stolt-Nielsen Limited

Miko Marine Launches US Subsidiary

Miko Marine AS has opened a subsidiary in Morgan City, La. from where it will be able to supply ship operators and salvage companies throughout the United States with its range of products, including its magnetic patches to prevent ships from sinking. The magnetic patches, often used in conjunction with Kevlar reinforced flexible patches, create a durable water tight seal where ships' hulls have been damaged by collision or grounding. Miko also produces high-power permanent magnets.

Photo: Miko

W&O Inks Distribution Deal

W&O, a global supplier to the marine and marine offshore markets for pipe, valves and fittings, valve automation and engineered solutions, announced the expansion of its European operations into the United Kingdom through a partnership with LK Valves & Controls, Ltd., a privately-owned, U.K.-based marine valve and actuator supply company. The agreement will allow LK Valves & Controls to exclusively stock and distribute W&O's comprehensive range of JIS marine valves and flanges.

LNG America, Buffalo Marine to Design LNG Bunker Fuel Network

LNG America entered an agreement with Buffalo Marine Service, Inc. (Buffalo Marine) to cooperate on the design of an LNG bunker fuel network for the

U. S. Gulf Coast region. LNG America is developing a hub-and-spoke delivery system for LNG as fuel for the marine market and other high horsepower applications.

Ultimately, LNG America will establish delivery infrastructure for the delivery of LNG as fuel in major U.S. ports. Bunkering company Buffalo Marine presently has more than 50 vessels dedicated to bunkering in the Gulf of Mexico region.

Rapp Marine Opens Factory in Serbia

Rapp Marine announced the opening of its new factory in Gruza Serbia, a factory with 10,000 sq.m. total roof coverage, 9,100 sq. m. production area, 40,000 sq. m. land and a total investment of $8.5m. The official opening was done by the Norwegian Ambassador in Serbia, Nils Ragnar Kamsvåg, together with Vice President of the Government of the Republic of Serbia Mr. Rasim Ljajic and Mr. Olav Fjell, Chairman of the Board of Rapp Marine.

B COOL Acquires MEMAC

With the acquisition of MEMAC, B COOL A/S is offers one entry to multiple maritime systems – both refrigeration solutions and monitoring of the engine rooms and other technical plants of the ships. B COOL A/S said it has acquired MEMAC, which specializes in software solutions for monitoring systems that are typically used in the ship's engine rooms.

For the customers this means that B COOL A/S is able to offer sales, service and consulting for refrigeration solutions–as usual – and in addition offering MEMAC solutions to new and existing customers.

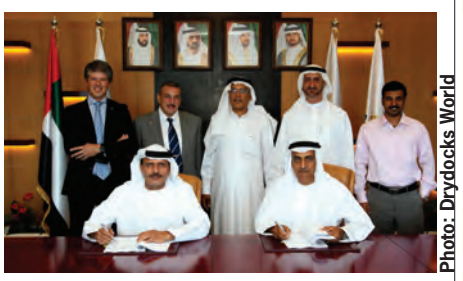


Photo: Drydocks World

Gulf Craft to Invest $100m in Dubai Shipyard

Dubai Maritime City (DMC) announced an agreement with Gulf Craft to invest in a free hold plot located within the marine district of DMC, on an area of approximately 900,000 square feet.

According to DMC, Gulf Craft plans to make a $100 million investment in developing this facility over the next five years.

It will include a state-of-the-art shipyard to manufacture high-end luxury yachts as well as a service center incorporating cutting-edge, highly specialized technology for the yacht industry.

UAE-based Gulf Craft, is one of the top 10 manufacturers of superyachts globally, completing and delivering more than 9,000 vessels to date and winning a number of local and international awards.

Fujifilm Debuts New Coating System

Fujifilm Smart Surfaces said its silicone fouling-release system solution will help save fuel and time during drydocking, among other benefits. The DUPLEX Tie Coat formula incorporating nanotechnology is a synergy of three layers.

Experimental Floating Wind Farm

Launched in March 2012, the Fukushima experimental offshore floating wind farm project sponsored by the Ministry of Economy, Trade and Industry is nearing the installation phase as preparatory works for the installation of the 7MW oil pressure drive-type wind turbine on the three-column semi-sub floater at Onahama port, Fukushima, are almost completed and delivery from Nagasaki to Onahama has started.

Participating in the experiment is a consortium comprised of Marubeni (project integrator), the University of Tokyo (technical advisor), Mitsubishi, Mitsubishi Heavy Industries, Japan Marine United, Mitsui Engineering & Shipbuilding, Nippon Steel & Sumitomo Metal Corporation, Hitachi, Furukawa Electric, Shimizu and Mizuho Information & Research.

The scope of work included in the project's second term includes assembly and setting of two units of the 7MW oil pressure drive-type floating wind turbines, delivery of the facilities to the testing area and connection to the undersea cable.

Construction of the nacelle for the 7MW oil pressure drive-type wind turbine is in progress at Mitsubishi Heavy Industries, Ltd. Yokohama Dockyard & Machinery Works, while the tower is being built at Mitsubishi Heavy Industries, Ltd. Kobe Dockyard & Machinery Works.

As for the mooring system and undersea cables, preceding works such as installation of chains, anchors and

Towing the three-column semi-sub at Nagasaki port

undersea cables at the testing area have been successfully completed. Also completed was the ground improvement and installation of the undersea mound at Onahama port for mounting the wind turbine on the three-column semi-sub. Several activities need to be completed to start operation of the power facilities.

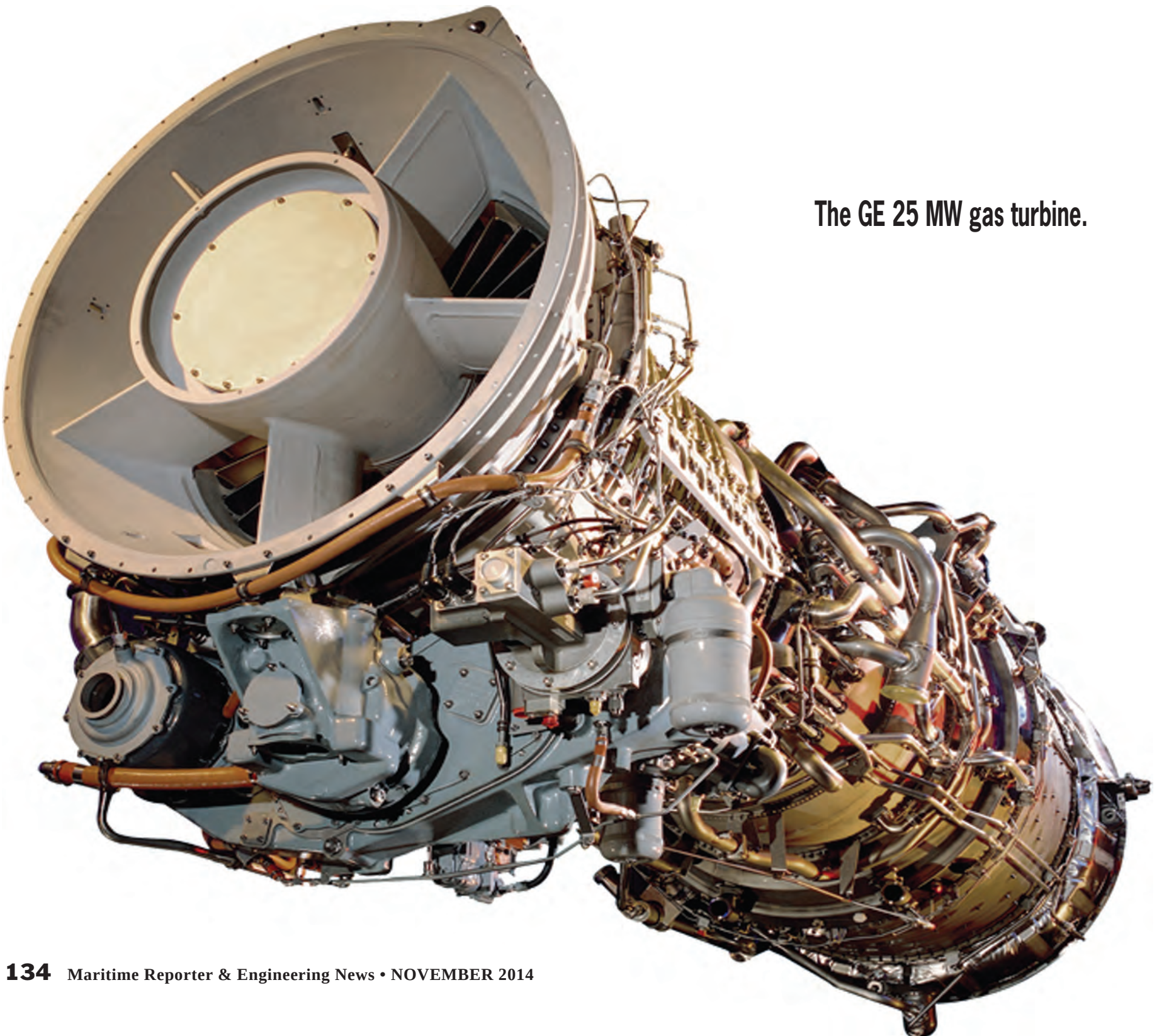
The floater and mounting are expected to arrive at Fujiwara quay, Onahama port on November 10, after which assembly of a large-scale crane at Onahama port for the purpose of the installation work will take place until late January. In early February, the 7MW oil pressure drive-type wind turbine will be installed on the three-column semi-sub floater, and the facility and its mooring operation will be delivered in the testing area.

Bolsinger VP Marine Ops, GE Marine

As the commercial marine market faces increasingly stringent propulsion system emission restrictions and fuel cost pressures, propulsion technologies such as gas turbines can gain traction in more mainstream commercial applications. Maritime Reporter & Engineering News *recently spent some time with* ***Brien Bolsinger****, GE Marine's VP of Marine, for insights from this traditional gas turbine power.*

As GE is mammoth, can you concisely explain the products and services that GE Marine offers to the global marine market?

We sell complete propulsion systems for diverse ship applications in both the commercial and naval marine markets. GE Marine is one of the world's leading manufacturers of aeroderivative marine gas turbines, ranging from 4.5 to 52 MW. Our gas turbines are excellent prime movers for mechanical drive, hybrid, or all electric propulsion systems. On the commercial front, our gas turbines are used in oil & gas for floating production, storage and offloading vessels, as well as on platforms. Our units are on passenger ships of various types: cruise ships, fast ferries and yachts. In the future, we see gas turbines bringing advantages to LNG carriers, too. From a naval perspective, we have a fleet of marine gas turbines powering various military ships, ranging from patrol boats on the small side, to aircraft carriers and may other ship classes in between. Our engines power ships in 33 navies around the globe and have garnered more than 13 million operating hours. But we are more than an equipment supplier. We offer complete service capabilities through our own overhaul facility, as well as through a network of authorized service providers.



The GE 25 MW gas turbine.

"Our turbines are fuel-flexible, capable of burning diverse fuels including LNG."

Brien Bolsinger, Vice President Marine Operations, GE Marine (Evendale, Ohio)

Shipowners today – commercial and naval – are faced with new rules regarding emissions, and perpetually battle the fuel cost issue. How are these and other drivers affecting the use of gas turbines to power new commercial vessels?

Key market drivers remain tightening of worldwide emissions regulations as well as fuel pricing. New IMO guidelines will require lowering of SOx emissions by January 1, 2020. In concert, we anticipate the price gap to shrink between Marine Gas Oil and low sulfur diesel fuel, thus improving gas turbine economics. We also are seeing an extraordinary global build-out of the LNG infrastructure to support widespread use of this clean-burning and least expensive fuel in the marine industry.

Our turbines are fuel-flexible, capable of burning diverse fuels including LNG. All the while, GE gas turbines can meet stringent environmental emissions regulations, especially when equipped with our Dry Low NOx emissions (DLE) combustion system. This optional technology can meet Tier III IMO/Tier IV United States Environmental Protection Agency requirements now operating on gas or liquid fuel, with no exhaust treatment and no methane slip.

And the power density of our gas turbines – meaning their high power in a light weight, small footprint – offers room for more cargo or passengers. Simply stated this means GE's gas turbine-based systems bring value to operators of nearly any commercial ship requiring 4 MW or more in power.

We know that GE Marine is a ubiquitous name in world maritime circles, but for the benefit of our readers can you discuss GE's gas turbine experience in the global commercial marine sector?

We have delivered more than 90 of our marine gas turbines worldwide since 1995 for many commercial applications, including 17 cruise ships, five high speed yachts and 19 fast ferries. All told, the worldwide industrial and marine gas turbine fleet has garnered more than

Artist rendering of the gas turbine-powered LNG carrier.

The Francisco fast ferry.

85 million operating hours, 13 million of which are in marine applications.

A recent pioneering project that relies on GE gas turbines is the fast ferry Francisco. Operated by Buquebus, between Buenos Aires and Montevideo, Francisco is the world's fastest commercial ship. Francisco began operating in July 2013, powered by two GE's dual fuel 25 MW gas turbines; the ferry has the ability to operate on both MGO and LNG. These engines power the ship to speeds in excess of 50 knots during normal operation on either gas or liquid fuel. Also, the (compact footprint of the) gas turbines allowed the ferry to incorporate a 11,840-sq. ft. duty-free shop – reportedly the largest shopping area ever installed on a fast ferry.

GE gas turbines (also) blazed a trail in the cruise market; the only gas turbines installed on cruise ships anywhere in the world today.

And we have been in the commercial market for quite some time as demonstrated with the two 4.5 MW GE marine gas turbines that have been operating since 1995 onboard TurboJET's Foilcat fast ferry. This multihull hydrofoil catamaran, which links Hong Kong to Macau, can carry 423 passengers, with a maximum service speed of 45 knots.

From where you sit, what are some of the operational advantages of gas turbines on commercial ships?

There are many, including:

- **Power density:** As I mentioned, one of the most obvious benefits of using our gas turbines is their size and weight advantages. This power density offers flexibility as to where you can place the propulsion system onboard the ship, requiring reduced structural steel to support the system within the ship, and freeing up more revenue-generating payload space. A perfect example is on cruise ships, where the gas turbines have been placed inside the funnel at the top of the ship, opening up space for an additional 45 state rooms in the hull below.
- **Low NOx emissions:** With our dual fuel DLE combustion system, GE gas turbines in a combined cycle operation meet even the most stringent pending 2016 levels when burning either (MGO or natural gas fuels, without exhaust after treatment. To date, we have manufactured 880 DLE systems for our aeroderivative gas turbines for industrial applications.
- **Fuel Diversity:** Our gas turbines offer fuel flexibility by being able to operate on various fuels including MGO, biodiesel, bio-synthetic paraffinic kerosene blends and natural gas. Fuel flexibility is even more beneficial today as commercial ship operators adopt dual-fuel operating scenarios to meet new emissions regulations. Dual fuel gas turbines operate in gas fuel mode (without liquid pilot fuel), or liquid fuel mode, and change between modes at any power level within 30 seconds.
- **Reduced maintenance costs:** We follow an "on condition" maintenance philosophy. This means that engine overhaul is not time-limited, but arranged when necessary as revealed during a regularly scheduled inspection. Even while operating at full power, 100% of the time, combustor and hot section repair intervals can stretch to 25,000 hours when burning natural gas.
- **Increased availability:** This maintenance philosophy yields increased availability of the vessel. When an engine overhaul is required, the gas turbine is removed and replaced by a spare unit, usually within 24 hours. Overhaul is not performed in-place (onboard the ship), but under shop conditions at a land-based depot facility.

What are the most popular ship configurations to use GE gas turbines?

Since propulsion architecture is based on the power required, the duty cycle, environmental concerns and many other factors, these are the most popular cycles used for ship propulsion:

- Combined gas turbine system mechanical drive - driving propellers (COGAG)
- Combined gas turbine and diesel mechanical drive (CODAG)
- Combined gas turbine or diesel mechanical drive (CODOG)
- Hybrid drive options: combined diesel electric or gas turbine (CODOG)
- Combined gas turbine, electric and steam system (COGES) for electric drive

We recently signed a MOU with Lloyd's Register to identify potential gas turbine-powered commercial ship projects. This allows GE and Lloyd's Register to work with shipyards to approve in principle GE gas turbine-powered commercial vessels for global customers. Separately, GE is teaming with Dalian Shipbuilding Industry Company and Lloyd's Register to jointly develop a design for a gas turbine-powered LNG carrier.

Are there any other noteworthy,new technologies is GE Marine pursuing that would have application in the marine market?

GE teamed with Echogen Power Systems to provide Echogen's exhaust heat-to-power products using CO2 in a closed loop configuration. These products enhance GE's mechanical, hybrid and all-electric propulsion system solutions, boosting efficiency by capturing the heat inherent in the gas turbine or diesel engine exhaust stream and turning it into electricity. Echogen's system allows for a more compact, lighter and economical configuration than traditional steam systems. Converting energy that traditionally gets exhausted into useful power allows the overall system thermal efficiency to increase to near 50%.

DSME Returns for More Dual-Fuel Engines

MAN Diesel & Turbo received an order for four MAN B&W 5G70ME-GI engines in connection with Daewoo Shipbuilding & Marine Engineering Co.,Ltd. (DSME) agreeing a deal with the BW Group to build two LNG carriers. The technical engine specification complies with IMO Tier II, with options to include remedies for Tier III compliance at a later stage. The 173,400 cu. m. vessels are scheduled for delivery in late 2017/early 2018 and will be built at DSME's Okpo shipyard in Geoje, Korea. The deal represents the second LNG ME-GI contract for DSME after a previous order signed in 2012.

Compliance with IMO Tier III regulations requires an 80% reduction in NOx emissions– compared to Tier I– within the designated emission control areas (ECAs) over a defined test cycle. MAN Diesel & Turbo has developed two main approaches to comply with these challenges: Selective Catalytic Reduction (SCR), which involves the catalytically accelerated reaction of nitrogen oxides with ammonia to form water and nitrogen, and Exhaust Gas Recirculation (EGR), which works by re-circulating a portion of an engine's exhaust gas back to the engine cylinders.

The ME-GI engine gives ship owners and operators fuel flexibility based on price and environmental considerations. MAN Diesel & Turbo sees significant opportunities arising for gas-fuelled tonnage as fuel prices rise and modern exhaust-emission limits tighten.

The G-Type

MAN Diesel & Turbo's G-type program entered the market in October 2010 with the entry of the G80ME-C9 model. The G-types have designs that follow the principles of the large-bore, Mark 9 engine series that MAN Diesel & Turbo introduced in 2006. Their longer stroke reduces engine speed, there by paving the way for ship designs with unprecedented high-efficiency.

Such vessels may be more compatible with propellers with larger diameters than current designs, and facilitate higher efficiencies following adaptation of the aft-hull design to accommodate a larger propeller. It is estimated that such new designs offer potential fuel-consumption savings of some 4-7%, and a similar reduction in CO2 emissions. In this respect, the fuel savings and performance characteristics for propellers featuring MAN Diesel & Turbo's unique Kappel blade design have been well documented in recent years. Simultaneously, the engine itself can achieve a high thermal efficiency using the latest engine process parameters and design features.

Since its introduction, close to 900 engines bearing the G-prefix have been ordered (including, now, 15 × G95 units), representing a total power output of some 15.9 GW. Of these, over 100 G-type engines have already entered service.

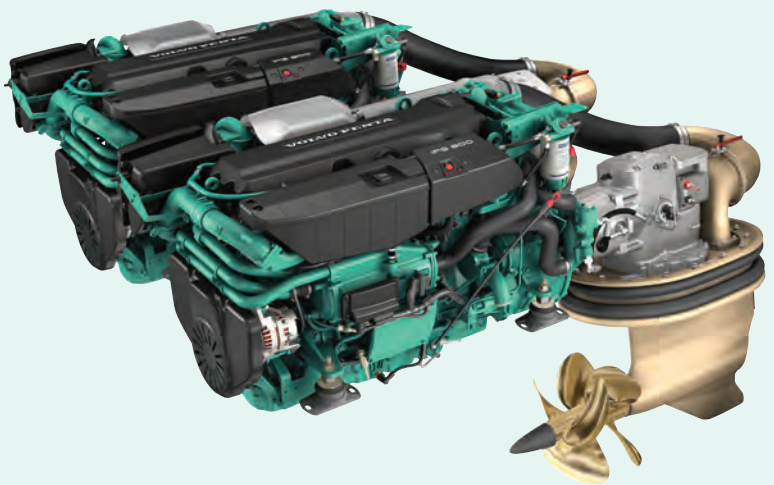
Volvo Penta Triple IPS and Dynamic Positioning for *New Fast Response Boat*

Fort Ripley, a new offshore emergency response craft entering service in Charleston, S.C., is reported to be the first commercial vessel in North America to be powered by triple Volvo Penta IPS drives. Designed by C. Raymond Hunt Associates, built by Gladding-Hearn Shipbuilding, Duclos Corporation, and owned by Southeast Ocean Response Services Inc., the USCG-certificated 64-ft. aluminum boat, was commissioned in early October.

Fort Ripley's primary mission is to allow ships to meet federal requirements for rapid offshore FiFi, salvage and emergency response, providing coverage between Morehead City, N.C., and St. Augustine, Fla. It will also serve as a fireboat in Charleston Harbor, a supply boat for ships at anchor and an additional launch for the Charleston Pilots and other marine operators in the region.

It is equipped with three IPS drives, each powered by a commercially rated Volvo Penta D13-700 diesel engine. Each of the independently steerable IPS drives has dual counter-rotating forward-facing propellers. The IPS can be controlled from the wheelhouse or either of the two aft docking stations using a three-axis joystick. The Dynamic Positioning System (DPS) provides fully automatic hands-off precise station-keeping under GPS control. The triple engine configuration allows the center engine to decouple from the drive and power a 3,500-GPM fire pump while the two outboard drives easily maneuver the vessel or maintain position automatically using DPS.

In addition to its 3,500 GPM dual-monitor foam firefighting system, Fort Ripley features a diver platform, dual-purpose breathing apparatus recharging system, 1,000-pound crane, four-ton deck cargo capacity, VHF and satellite voice communications, day/night cameras with satellite data uplink, and a PYROLANCE steel-penetrating nozzle system. It is U.S. Coast Guard certificated for a 12-person response team.



Credit: Peter Boyce Hunt Design

New Propulsion Couplings

Renold Hi-Tec Couplings, of Halifax, U.K., will debut a new range of high temperature, marine propulsion rubber-in-compression couplings at the International Workboat Show in New Orleans. The new HTB-MP range is a second generation of couplings based on the existing HTB-GS range. Suitable for use in high temperature applications the new couplings have a blind assembly construction designed for easy mounting inside bell housings. They were designed to operate in only one direction so that half of the rubber blocks will always be driving, or leading, and the remainder will always be trailing. Renold Hi-Tec's engineers were able to reduce the size of the trailing rubber blocks, as they do little work, and this has enabled the overall size of the coupling to be reduced too. The resulting reduction in the coupling's weight and inertia decreases the bending moments on the drive shaft.

Although the couplings only operate in one direction they can be supplied to operate either clockwise or counter-clockwise. They have interchangeable rubber and metal components, except for the cover that ensures the correct direction of operation. The lead blocks carry all the torque and are specially selected for each application to provide optimum control of resonant torsional vibration. They also provide severe shock load protection from transient conditions ensuring continues operation of the driveline.

Once installed they are maintenance free, requiring no lubrication or adjustments. The couplings are designed to work in extreme temperatures from -50 to +200 degrees C. Sixteen frame sizes are currently available for engine flywheels from SAE 10 to 21 and torques up to 53.3 kNm.

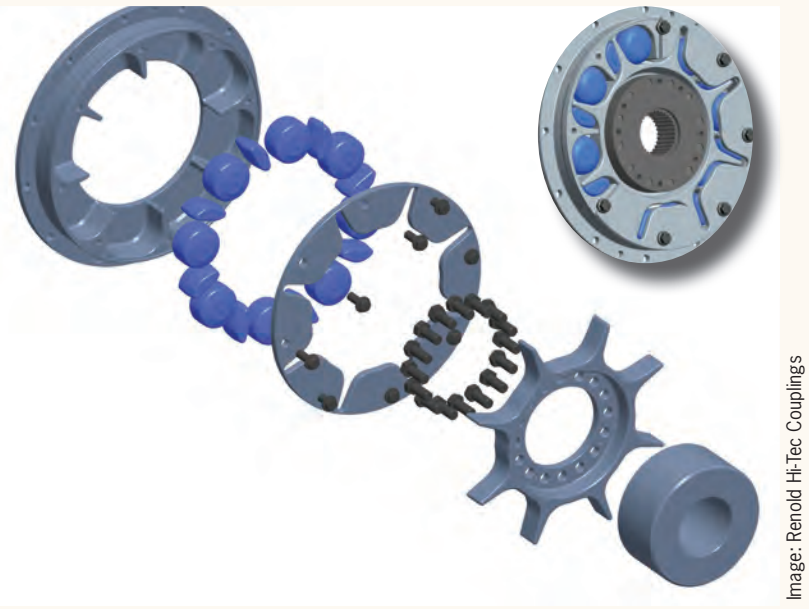


Image: Renold Hi-Tec Couplings

Cummins Auxiliaries for New OSV

Reliable auxiliary power is as important to a modern off shore vessel as are the main propulsion engines. Ample and reliable electrical power is essential to the basic support systems from the galley appliances to the wheelhouse navigational devices. The Ms. Charlotte, recently delivered to Edison Chouest by Bollinger Shipyards of Lockport, Louisiana, is a powerful demonstration of this. Designated a 300 Class Deep Water Support Vessel, the ship has a pair of GE 3,125 hp 8L250 main propulsion engines.

The vessel has extensive electrical requirements, including cargo pumps and dual bow and stern thrusters for the Dynamic Positioning 2 system.

To meet these requirements and to provide redundancy, the Ms. Charlotte vessel is fitted with two Cummins QSK19-powered 525-kW generator sets and two Stamford PM734F 1500 kW shaft generators. To meet SOLAS requirements there is also a Cummins 6CTA8.3-DM powered 175 kW emergency generator set.

Originally built by Bollinger for their Bee Mar subsidiary, the Ms. Charlotte was one of seven vessels transferred to Edison Chouest when that firm purchased the Bee Mar fleet.

Courtesy of Cummins Marine

Genset with SCR for IMO Tier III

Rolls-Royce brand MTU and Fairplay Towage are set to test an MTU diesel genset with SCR exhaust after treatment in a harbor tug in order to verify compliance with IMO Tier III emission requirements that come into force as of 2016. According to the manufacturer, the nitrogen oxide (NO x) emissions will be cut by 90% compared with the IMO Tier I regulation that was introduced in 2000.

"This is one of the world's first tests of high-speed diesel engines equipped with an SCR system designed to meet the NOx levels required by IMO Tier III," said Dr. Michael Haidinger, Chief Sales Officer of Rolls-Royce Power Systems.

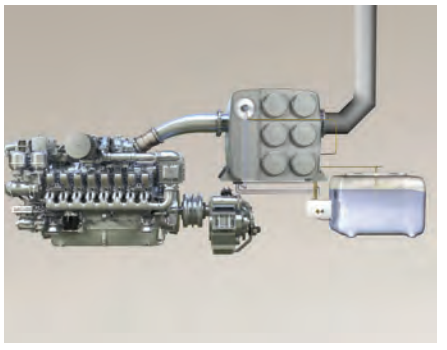
The new Fairplay tug with a bollard pull of 90 tons is currently being built in Spain at Astilleros Armon and is scheduled to go into service in the Port of Rotterdam as of 2015.

MTU is supplying the two main 16V 4000 M63L propulsion engines, each delivering 2,000 kW, a 16-cylinder 4000 M23F diesel genset rated at 1,520 kW, and the SCR system. The exhaust aftertreatment system, with selective catalytic reduction (SCR) technology, is connected to the diesel genset.

The tests on the Fairplay tug, which will run continuously for 10,000 hours, are designed to enable MTU to get ready for the series solution for IMO Tier III marine engines. As of 2016, newly built ships that operate in Emission Control Areas (ECA) in North American coastal waters and in the U.S. Caribbean will have to comply with the NO x limits specified in the IMO Tier III emission standards and the MARPOL Annex VI regulations of the International Maritime Organization.

Fairplay Towage with its registered office in Hamburg is one of Europe's leading tugboat operators and operates a fleet of around 40 ships in Europe.

www.mtu-online.com



New Generation of Turbochargers

For the first time, MAN Diesel & Turbo will develop a turbocharger series exclusively for two-stroke engines that is especially designed and optimized to fulfill Tier III requirements. Compared to the TCA turbocharger range, TCT efficiency shows an increase of 5% through using newly-developed compressor and turbine-wheel geometry, consequently increasing waste-heat-recovery potential by 30%. The TCT range will also deliver a 10% greater air flow at a turbocharging pressure 25% higher, while being 30% smaller and 40% lighter than the existing TCA range. MAN Diesel & Turbo reports that the first TCT turbocharger is expected to reach the market in 2016 after an extensive validation and field-testing program.

"Modern turbochargers must meet many demands, including meeting technical requirements – such as Tier III compliance – at the most competitive price, having small dimensions to facilitate installation in cramped spaces, not to mention characteristics such as high operational reliability, low maintenance frequencies and a long working life. The conflict of objectives is obvious," said Dirk Balthasar, Head of Sales and Promotion – Turbocharger Business Unit – MAN Diesel & Turbo.

MAN Diesel & Turbo reports that individual TCT turbochargers will cover a wider range of engine ratings, and that engine manufacturers will be able to use just one size for turbocharging different numbers of cylinders.

It also said that individual adaptation of the turbocharger to the engine will be by the established method of using a variety of exchangeable parts within the turbocharger, while TCT production costs can be controlled by dispensing with the alternatives required for four-stroke engines. The requirement of Tier III engines – featuring EGR technology – for wide compressor maps to cover different EGR flow rates will be met with the development of specific compressor-wheel geometries with wide compressor maps.

www.mandieselturbo.com

Class Approval for Wärtsilä Steerable Thruster

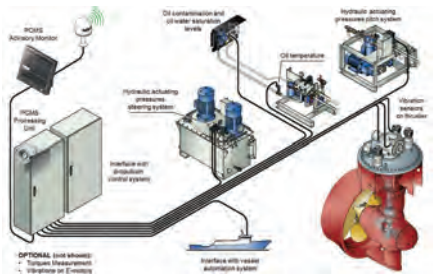
DNV-GL approved the design of the Wärtsilä WST-14 thruster, significant as approval was granted based on a thruster design that has yet to be introduced into full series production. The approval by DNV-GL follows the release of Wärtsilä's next generation of thrusters at the end of 2013. The new WST-14 is part of the Wärtsilä Steerable Thruster (WST) compact series, which is aimed at tugs, anchor handling vessels, and coastal and inland waterway cargo vessels. The series is also designed so as to comply with the latest environmental regulations, such as the US EPA VGP 2013 requirements. The approval is an important step towards obtaining type approval for the WST-14 thruster. Wärtsilä has earlier acquired type approval for several thruster products. However, for the newest Wärtsilä Steerable Thruster (WST) portfolio, Wärtsilä has begun the process towards type approval from the earliest possible moment. A prototype of the thruster is being built at the company's dedicated manufacturing facilities in Wuxi, China, and will be shipped to Finland for testing and validation at the Wärtsilä Propulsion Test Center.

Wärtsilä Expands Propulsion Monitoring Services

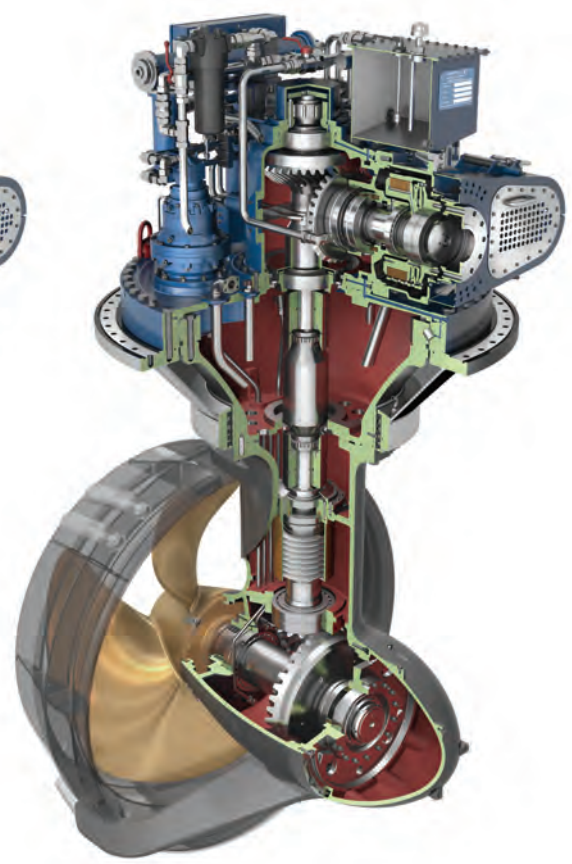
Wärtsilä expanded its offering in propulsion monitoring services, as the Wärtsilä Propulsion Condition Monitoring Service (PCMS) will feature expanded functionalities and is available in two editions - PCMS Starter and PCMS Professional. The need for certainty of operations and long-term maintenance planning is fulfilled with a new functionality: Dynamic Lifetime Prognosis (DLP).

Wärtsilä Propulsion Condition Monitoring Service is a solution for monitoring propulsion equipment, providing real-time advice and periodic reports concerning the condition of the machinery and information for maintenance planning.

The Professional edition provides long-term predictability in maintenance planning and is superior in terms of detecting potential failures. Thus it isrecommended for vessels with a high criticality of operations. Typical applications include drilling, cable-laying, heavy lifting and seismic research operations.



The Starter edition is tailored for customers with prime focus on reliability and reduction of operational costs. Typical applications for this edition include offshore supply, anchor handling, towing and diving support.



Cat, Deltamarin Develop Modular FPSO Power Unit

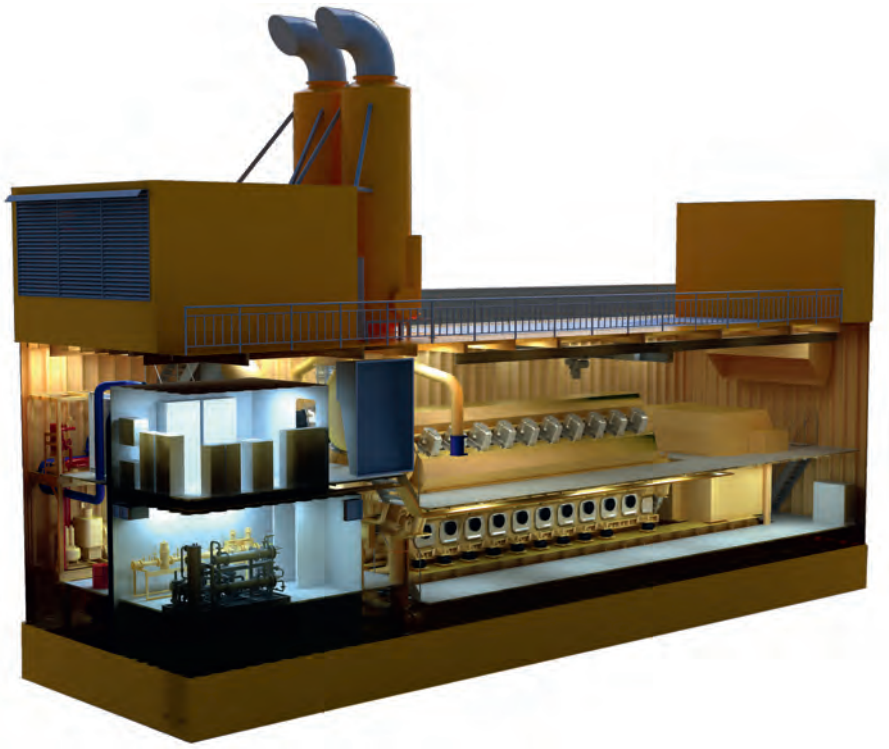


Image courtesy of Caterpillar

Caterpillar Oil & Gas planned to launch the Cat Offshore Power Generation Module, a new modular solution for FPSO and offshore platform main power. The Cat Offshore Power Generation Module is a turnkey EPC scope, scalable, single lift, modular power plant product that includes full integration into the FPSO or platform structural design.

The Cat power generation solution was designed specifically to meet the needs of FPSO and fixed production platform main power applications in cases where a gas turbine is not ideal. Available from 4 to 17.3 eMW per module, the Cat Offshore Power Generation Module is designed to run on liquid, diesel, crude and heavy fuel oil, gas or in dual fuel mode and meets current and future emission regulations to maximize flexibility and reduce operating costs.

www.catoilandgasinfo.com

Photo courtesy of WEG

WEG's CFW11W Offers Higher Power

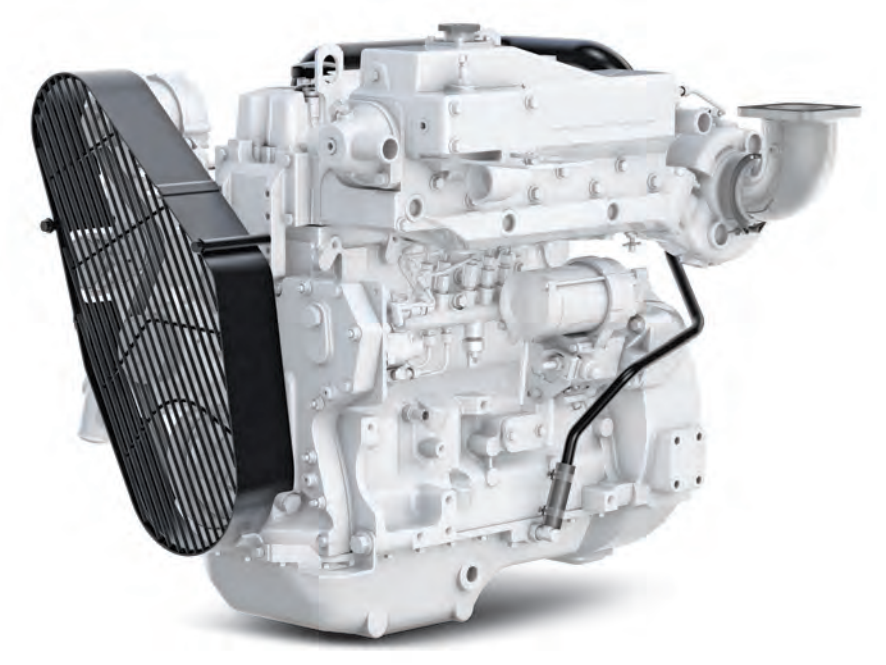
WEG presented its CFW11W variable speed drive to the shipbuilding and marine industry for the first time recently, and according to WEG, the water-cooled drive offers up to 40% higher power in a more compact size than standard air-cooled inverters and as a result enables shipbuilders to increase efficiencies and optimize their processes on board. The modular, water-cooled CFW11W frequency inverter from WEG offers a solution to space and corrosion challenges.

With power ratings from 450 kW to 2,800 kW, CFW11W is suitable for low-voltage applications and is suited for critical and support drive systems such as rudder systems, bow and stern thrusters, winches, pumps and fans. As the inverter is water-cooled, there is no additional need for fans and it offers significant size savings compared to air-cooled models. CFW11W is an economic solution, eliminating the need for costly air-conditioned electrical equipment rooms.

Aside from water cooling, the CFW11W inverters are structurally identical to WEG's standard CFW11M models in the same product family.

www.weg.net

John Deere Expands Marine Tier 3 Engine Lineup



John Deere Power Systems (JDPS) introduced new propulsion ratings to its EPA Marine Tier 3 engine offerings. The new PowerTech 4045TFM85 propulsion ratings expand the John Deere Marine Tier 3 lineup with two ratings for continuous and heavy duty applications (M1 rating with 75 kW (100 hp) at 2400 rpm and M2 rating with 93 kW (125 hp) at 2500 rpm).

The PowerTech 4.5L ratings join the previously announced lineup of John Deere Marine Tier 3 propulsion engines from 75 to 559 kW (100 to 750 hp). The 4045TFM85 ratings meet U.S. EPA Marine Tier 3 emissions regulations, NRMM (EU 97/68/EC) as amended and are MARPOL Annex VI exempt.

Features of the PowerTech 4.5L propulsion engine include a high-pressure common-rail fuel system, a water-cooled exhaust manifold, and the choice of keel cooled or integrated heat exchanger configurations.

Successful MTG Light Off for USS Zumwalt

The future USS Zumwalt, the first ship of the DDG 1000 multi-mission destroyer class, performed a successful Generator Light-Off of its first Main Turbine Generator Set (MTG) recently. The ship is now power self-sufficient enabling follow-on systems testing and trials.

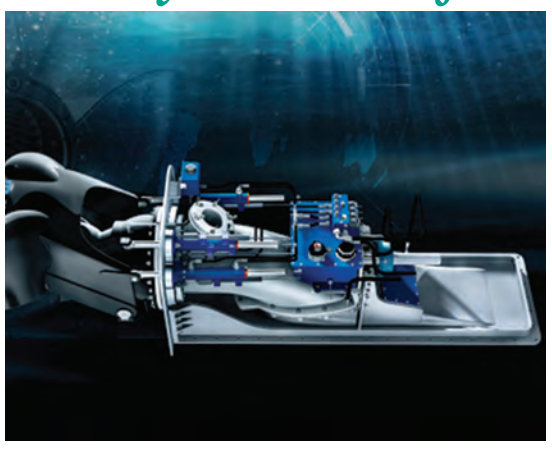
"I am very pleased to confirm the successful Light-Off of the first Rolls-Royce MT30 Main Turbine Generator Set," said Neil Pickard, Program Executive, Rolls-Royce. "(This) is significant as it enables us to progress with more comprehensive and self-sufficient testing of the ship's Integrated Power System (IPS) over the weeks and months ahead."

The IPS on the DDG 1000 generates all the power required for main propulsion, combat systems, sensors and weapons systems.

Found onboard Zumwalt are two Rolls-Royce MT30 Main Turbine Generator Sets (MTGs) and two RR4500 Auxiliary Turbine Generator Sets (ATGs) that will provide a total of 78 MW for total ship power - the MTGs provide 35.4 MW each and the ATGs 3.8 MW each.

www.rolls-royce.com

MJP Introduces Hybrid Waterject



Marine Jet Power (MJP) introduced a new product concept that is optimized for high-speed applications. According to MJP, the new hybrid waterjet combines the best characteristics of the MJP DRB series with the Ultrajet series. MJP said the idea to take the best from its DRB and Ultrajet series and make a Hybrid that is optimized for high-speed applications came soon after MJP's merger with Ultrajet. According to MJP, its DRB products show superior wear strengths and performance, so the company started building the new concept from there. Then it added mixed-flow technology with minimum tip clearance and inboard hydraulics mounted in an aluminum frame for a package suitable for all high-speed applications.

www.marinejetpower.com

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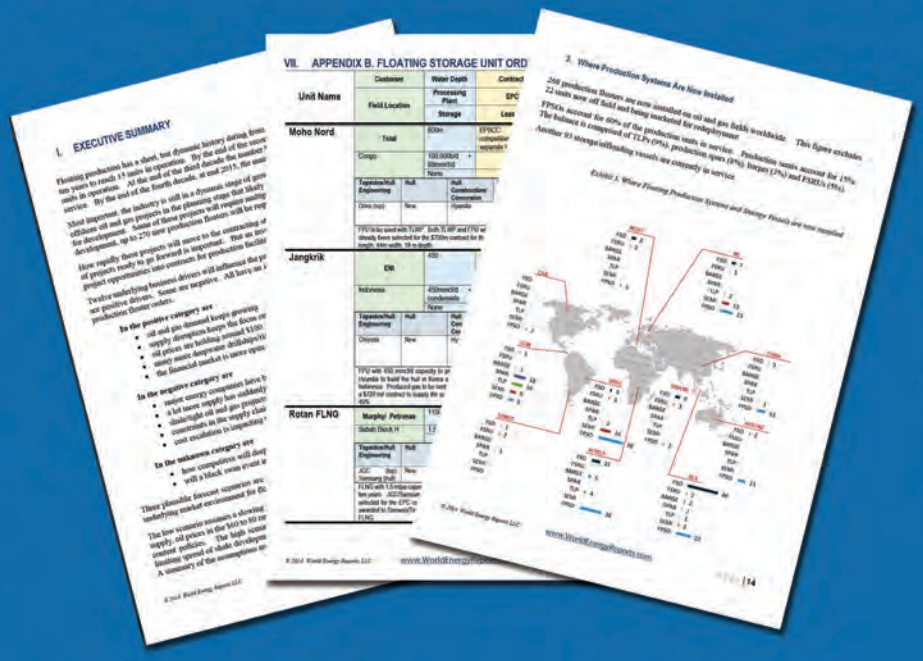

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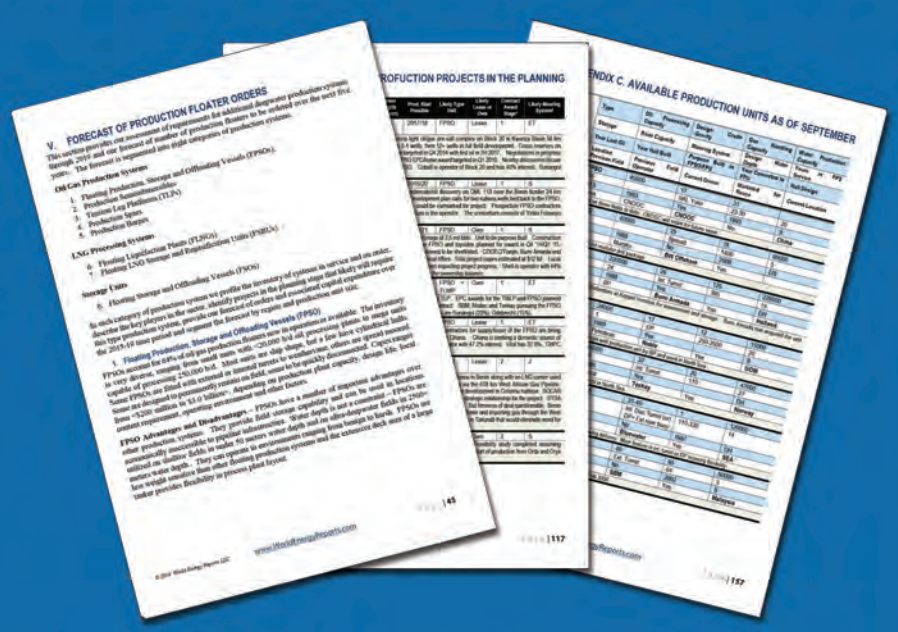

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Jim McCaul, Managing Director and founder of International Maritime Associates (IMA) has produced 50 multi-client industry reports on the floating production sector over the past 18 years. IMA's "floater reports" have been a widely cited reference source in the offshore industry, and our annual forecast of equipment orders has been widely referenced in investment presentations, industry publications and other consulting firm reports.

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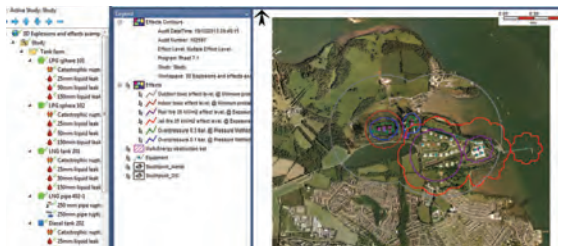
This is One, Big Specialty Valve

Photo: McDermott International, Inc. 2014.

After nearly two years of planning and development, a team of McDermott employees has achieved a first of a kind in the valve industry; creating what is reported to be the world's largest forged body specialty valve, in collaboration with a leading valve manufacturer. The valves are destined for the INPEX-operated Ichthys LNG Project.

"The Ichthys Project umbilical, riser and flowline infrastructure – which will be installed at the Ichthys Field offshore Western Australia - requires connection of the subsea riser base to the 42-in. gas export pipeline going to the onshore LNG processing facility," said Jonathan Parkes, McDermott Senior Project Director. "This meant that six 42-in. valves had to be specially designed and fabricated to meet the 40-year design criteria. To our knowledge, these are the world's largest, single-piece forged, top entry ball valves." Each valve measures approximately nine meters in length and seven meters high, and weighs more than 100 tons. The first valve has been successfully built and tested. The second valve is currently undergoing factory acceptance testing and is expected to be ready in September. Once all six valves have passed factory testing, two will be installed offshore in 270 meters of water, while the remaining four will be installed onshore, one at the landfall block valve and three at the processing facility at Bladin Point.

DNV GL Updates Phast Software



DNV GL's Phast software for process industry hazard analysis has new features designed to increase efficiency, improve the understanding and communication of results and support rapid decision-making. These features include enhanced visualization and a more flexible selection of default explosion models. Phast software is used to analyze these hazards so that their consequences can be managed or reduced by improving the design of the process or plant, modifying existing operational procedures or implementing other mitigation measures.

www.dnvgl.com

SGB 2000 Gyrocompass

The SGB 2000 gyrocompass manufactured by Teledyne TSS has been certified by DNV as meeting the standard required for use aboard IMO registered ships. The certification confirms that the SGB 2000 meets the performance standards required by the IMO and enables flag states to authorize its use on any ship. The SGB 2000 solid state gyrocompass incorporates maintenance free ring laser gyros and accelerometers which have a MTBF (Mean Time Between Failure) in excess of 300,000 hours. With no moving parts and no requirement for regular maintenance the SGB 2000 offers a cost saving alternative. The SGB 2000's accurate and stable headings are provided by the gyro which has a dynamic accuracy <0.25° RMS secant latitude that can be maintained during turns of up to 200 degrees per second.

www.teledyne-tss.com

B COOL A/S Strengthens its Position with Acquisition of Memac

With the acquisition of MEMAC, B COOL A/S now becomes able to offer the customers one entry to multiple maritime systems – both refrigeration solutions and monitoring of the engine rooms and other technical plants of the ships. Now B COOL can service and supply SEA modules which are used at 150-200 ships that we have not previously had as clients. MEMAC continues as the brand name and technology in a new, independent company – B COOL Controls A/S.

www.bcool.as

Hatteland's 20-inch Display

Hatteland Display's HM 20T07 NMD / CMD range of 20.1 Inch - 1600 x 1200 - UXGA resolution, 4:3 format military naval displays are approved to the industry's military standards. These products are used in C4i combat systems on active platforms around the world, and are set to continue supporting both the ongoing rollouts as well as retrofit requirements for years to come. Contrary to reports that the 20 inch format was no more, Hatteland Display can confirmed that the format is still available.

www.hatteland-display.com

ESAB's New Cutting Machine

ESAB Cutting Systems launched SGX, a compact, automated cutting machine for plasma and oxy-fuel cutting. SGX carries up to three tool stations, including up to two oxy-fuel torches and one plasma station that can be equipped with ESAB's m3-IGC Precision Plasma System for high-quality plasma cutting. Advanced features include the easy-to-use Vision T5 touch-screen CNC with built-in automatic nesting, as well as automatic gas controls and plasma automation powered by m3 Plasma technology.

www.esab-cutting.com

Shell Launches App to Track Marine Lube Orders

Shell launched its Shell Marine Products app which provides one-touch ability on mobile devices to track marine lubricant orders anytime, anywhere. This complements Shell Marine Products' (SMP) International Customer Service Centre (iCSC), that customers can contact 24 hours a day to order and check on the status of their orders. An additional feature of the app is SMP's Port Services Guide.

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Underwater Locator Beacons for VDR

RJE International announced a new line of underwater locator beacons for Voyage Data Recorders (VDR's) on large ships. The ELP-362M series of beacons is mounted on a ship's black box to facilitate location and recovery of data analysis, in the event of an accident. As of July 1, 2014 the IMO (International Maritime Organization) requires that all new voyage data recorders be fitted with 90 day battery life beacons, such as RJE's ELP-362M90 Underwater Locator Beacon.

www.rjeint.com

Automatic Lubrication System for Shell's Prelude

TrustLube supplied to SBM Offshore for Shell's Prelude FLNG. The system consists of an explosion proof grease cabinet to lubricate the radial wheel, axial boogie and axial boogie guiding of the world's largest turret. Stainless steel framed grease applicators are used to connect the metering devices to dispense the grease equally on the wheel surfaces. TrustLube's smart system is able to adapt its greasing cycle to the wind direction.

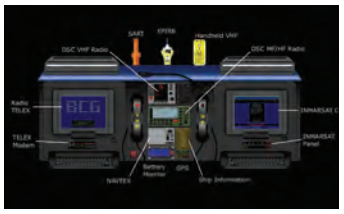
www.trustlube.com

Hempel Launches AvantGuard Primers

Hempel launched HEMPADUR AvantGuard, a portfolio of three new anticorrosive zinc primers designed for C4 and C5 corrosive conditions. Based on new patented AvantGuard technology, the primers are significantly longer lasting than zinc epoxies without AvantGuard but can be applied with the same application techniques. Zinc epoxies are used in a range of industries to protect industrial structures and equipment in highly corrosive environments where saltwater and high humidity corrode unprotected steel. However, back in 2006, Hempel made a discovery: only around one-third of the zinc in a standard zinc epoxy has any anticorrosive effect. After approximately 7,000 hours in the lab, Hempel said that it found a solution. AvantGuard uses hollow glass spheres and a proprietary activator to activate more zinc in the coating. The resulting coating reportedly delivers higher galvanic protection than zinc primers without AvantGuard technology and also enables barrier and inhibitor protection. The formulation also improves the coating's mechanical strength.

www.hempel.com

BCG Upgrades Virtual GMDSS Simulator



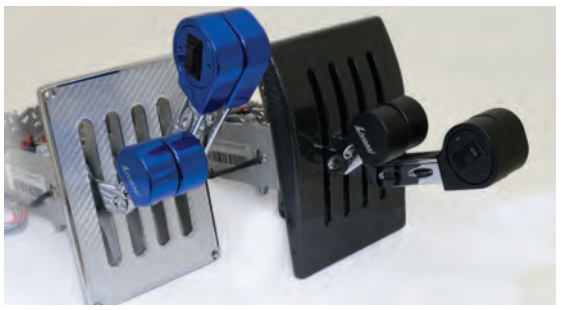
Buffalo Computer Graphics (BCG) Inc. released an updated version of its Virtual Global Maritime Distress and Safety System (VGMDSS) Simulation software. BCG's VGMDSS software is comprised of emulations of commercially available components to make up a complete suite of virtual devices capable of conducting GMDSS training in all four sea areas. Designed to be installed on a Windows PC with a single or dual monitors, the VGMDSS software features all the required components for a Desktop GMDSS simulator.

www.bcgeng.com

Livorsi Launches New Throttle Lineup

Livorsi Marine introduced the all new Platinum Series throttles, which it says are designed to be more ergonomically comfortable to the operator while being lighter and more compact for fitting into tight spaces. The Platinum series is finished with a two-coat process which helps prevent corrosion and can be configured for single or multiple engine's for drives, transmissions, jet drives or buckets.

www.livorsi.com



Delta-Y Assembly for Offshore Oil Bulk Cement/Barite Piping Systems

Victaulic introduces the Style DLY Delta-Y assembly, a combination of preassembled Victaulic cast grooved fittings, rigid couplings and butterfly valves. The Delta-Y assembly is designed specifically for bulk cement/barite systems on offshore oil platforms and is also ideal for drilling mud and other associated systems. The Delta-Y assembly offers quick and simple installation, space and weight savings, efficient operation and reduced maintenance downtime.

www.victaulic.com/ogc

Cummins Debuts Mobile Tier 4 Generators

U.S. EPA Tier 4 Final certified mobile generator sets with 150 kW to 275 kW power outputs are now available from Cummins Power Generation for the rental market. The new units are based on the Cummins QSB7 and QSL9 engine platforms that have undergone refinements to meet EPA Tier 4 Final regulations. Cummins was able to meet the new Tier 4 Final regulations through a combination of in-cylinder engine improvements, exhaust gas recirculation (EGR), selective catalytic reduction (SCR) exhaust aftertreatment and diesel oxidation catalyst (DOC). These engines do not require the use of a diesel particulate filter (DPF) to meet the new air quality standards. In addition, these mobile rental generators are approximately 4 to 5 percent more fuel efficient than previous Tier 3 models, according to the company. The Tier 4 Final regulations limit mobile generator set emissions to 0.4 grams per kWh of nitrogen oxides (NOx) and 0.02 grams per kWh of particulate matter (PM or soot). These levels represent a 90 percent reduction of the two pollutants from the previous Tier 3, which was introduced in 2005. The new Cummins Power Generation Tier 4 Final certified units include the C150D2RE generator set, standby rated at 150 kW, the C200D2RE generator set, standby rated at 200 kW and the C275D2RE generator set, standby rated at 275 kW.

www.power.cummins.com

New Simulation Tool for Collision Reconstruction

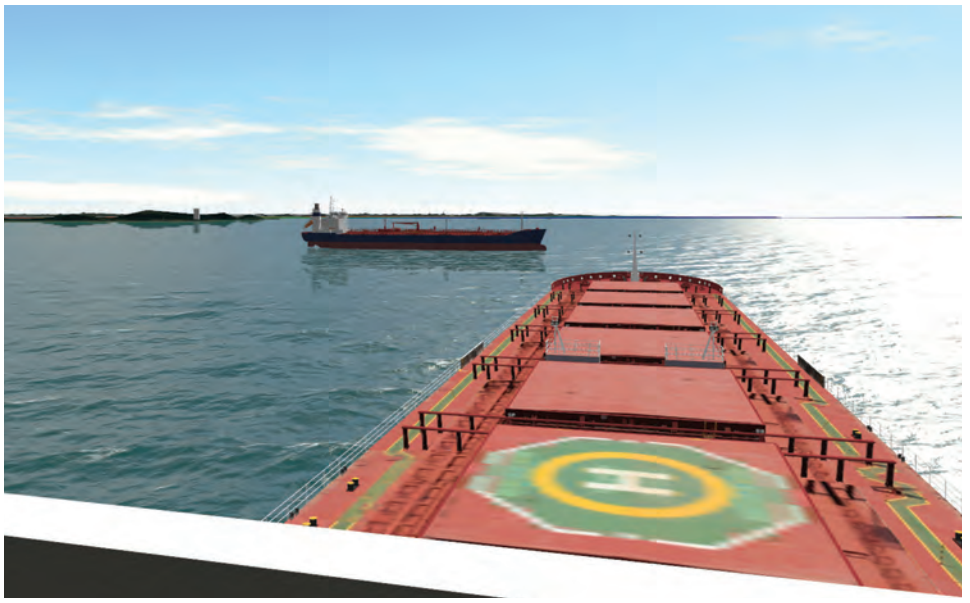


Image: BMT

BMT ARGOSS and BMT announced a new service as part of its marine casualty investigation portfolio. Using REMBRANDT, the simulation tool developed by BMT ARGOSS, the newly formed Collision Reconstruction and Simulation Team will be able to accurately reconstruct specific incidents involving collisions to identify the root cause and any lessons that can be learned. BMT's team, which includes experienced master mariners, chief engineers, navigation and hydrodynamic modelers and weather experts, has the essential skills, depth of maritime knowledge and crucial technology to reconstruct incidents using a visual format and readily understandable process.

The simulation uses shipboard Voyage Data Recorder (VDR) data, radar images and regional AIS information combined with high fidelity ship models, which can be remodeled to required parameters, to produce three-dimensional simulations. Voice, radar and position data sets are automatically synchronized, together with environmental data and navigational circumstances, to present a complete and seamless reconstruction of events for in depth analysis.

www.bmt.org

ACO Unveils New Plant for Upcoming Wastewater Rules

ACO Marine introduces a new version of its Maripur wastewater treatment range. The next generation ACO Maripur NF sewage treatment system was developed to ensure operators of specialist tonnage in the passenger and mega-yacht sectors comply with the impending IMO Resolution MEPC 227(64) – including Section 4.2. This requires vessels with 12 or more passengers operating in IMO designated 'Special Areas' to effectively treat also Phosphorous and Total Nitrogens.

www.acomarine.com

New Heater Kits for Northern Sea Route Vessels

Northrop Grumman has developed winterization field upgrade kits for vessels using the Northern Sea Route. These heater kits will enable Marine Navigation Radar Turning Units to be operated in temperatures down below -55 degrees Celsius, in addition to keeping the S-Band and X-Band sensors in the turning units free from ice. Northrop Grumman Sperry Marine has designed them to be attached in the field at or after installation, and they are compatible with all VisionMaster FT (VMFT) radar sensors. The winterization field upgrade kit is approved by the Russian Maritime Register of Shipping and allows the operator to extend the working temperature of any unit. With the opening of the Northern Sea Route and with new regulations for polar navigation coming into force, products will need to meet Safety of Life at Sea (SOLAS) requirements, which specifies that at least one radar be equipped with ice detection capability.

www.northropgrumman.com

Survitec Escape Slide for Norwegian Ferry

The all-electric Zero Cat ferry, currently under construction at the Fjellstrand yard in Norway, will enter service next year with Norled as the first Norwegian vessel equipped with Survitec Group's most advanced ESS MES automatic escape slide system. The new slide can be launched and ready for passenger use with the touch of a button and without any further intervention by the crew. When it enters service the Norled-operated Zero Cat will be fitted with four of the automatic 3.8-m Evacuation Slide Systems which each have single escape tracks and incorporate a 150-person open reversible inflatable life raft.

survitecgroup.com

New Rolling Bearing Grease from Klüber

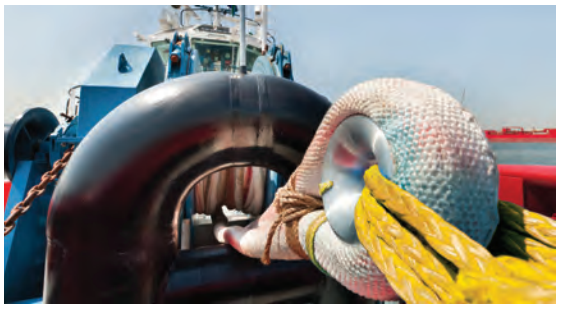
Klüber Lubrication introduced Klübertherm HB 88-182 for the long-term lubrication of rolling bearings. This lubricating grease offers excellent high-temperature properties and can be used for both low loads combined with high speeds and high loads combined with low speeds. It is fully synthetic and based on a thermally stable base oil, polytetrafluoroethylene (PTFE) thickener and special additives.

www.klueber.com

KO-LINK Towing Ring from Lankhorst Ropes

The KO-LINK towing ring, developed by KOTUG International BV, is available from Lankhorst Ropes. The KO-LINK ring increases synthetic towing line service life by preventing the HMPE pennant from cutting through the line. KO-LINK is a highly polished, lightweight, aluminum ring, which is inserted and attached to the splice eye of the towline.

www.lankhorstropes.com



New Plasma Cutting and Gouging System

Victor Thermal Dynamics launched an improved PAK 200i manual plasma cutting and gouging system, which has the capacity to satisfy the most demanding manual plasma application requirements. The system delivers 100% duty cycle at 200 Amps, is capable of hand cutting up to 2 ¾" (70mm) on mild steel, as well as 10 ipm (254 mm/min) on 2" (51 mm) carbon steel, and will remove up to 25 lbs. (11.3 kg) of carbon steel per hour. The PAK 200i now shares the same case and common platform with the company's other 200-amp products. Exclusive to the PAK 200i, and particularly useful for gouging applications, is the Tip Saver Plus feature. With accidental tip-to-work piece contact, the current will fold back to 35 Amps to ensure that the tip is not damaged, dramatically extending tip life. The PAK 200i system comes standard with the PCH 200 handheld torch, featuring a 70- or 90-degree torch head angle.

Portable Fire Extinguishers

Tyco Fire Protection Products (TFPP) launched the ANSUL SENTRY High-Flow, Stored-Pressure Fire Extinguisher to its global network of Authorized ANSUL Distributors. Designed specifically for commercial, compliance markets, this portable fire extinguisher provides cost-effective, high performing fire suppression to meet the requirements of NFPA 10 Standard for Portable Fire Extinguishers.

Available in 10-pound and 20-pound models with standard or corrosion-resistant coatings, the SENTRY High-Flow, Stored-Pressure Fire Extinguisher is designed to meet the requirements of NFPA 10 (Standard for Portable Fire Extinguishers) Section 5.5.1.1 for pressurized flammable liquids and pressurized gas fires.

New Gear Grease and Oils from Klüber

Klüber Lubrication introduced Klübersynth GE 46-1200, a synthetic long-term gear grease for a variety of gear applications, and Klübersynth UH1 6 Series, a complete line of polyglycol gear oils available in ISO VG from 100-1,000 for a variety of industries. Klübersynth GE 46-1200 grease, suited for temperatures ranging from -30 C to 120 C, has a high load-carrying capacity and protects against wear and corrosion.

The grease, which does not contain lead or solid lubricants, was developed to lubricate spur gears, bevel gears and worm gears with material pairings steel on steel, such as gear motors, small gears and gears in power tools.

Klübersynth GE 46-1200 is also designed to lubricate toothed couplings, ball and roller guides, and rolling and sliding bearings.

www.klueber.com

Self-Leveling, Height Adjustable Chocks

SKF Vibracon self-leveling and height adjustable chocks are designed to enable easy and accurate mounting of rotating machinery to base frames, steel foundations or plates while eliminating Soft Foot (improper contact between a machine casing and the baseplate used to support it). These mechanical chocks are designed to compensate for angular misalignment of up to four degrees between the mounting foundation and bottom of the machine foot. According to SKF, this ultimately eliminates Soft Foot and allows for optimal and economical mounting without requiring machining of skid bases and milled blocks, trial and error guesswork of regular shims. Vibracon chocks can be supplied in a range of configurations, standard and extended chocking heights (ranging from 30mm to 250mm), footprint diameters (60mm to 250mm), and materials including carbon steel, treated carbon steel, stainless steel, alloy steel, shock hardened and K-Monel.

www.vibracon.com

ESAB's New Welding Wire

ESAB Welding & Cutting Products introduces Coreweld C6 LF, a new low manganese emission, high efficiency metal-cored welding wire developed in response to new EPA regulations and guidelines from ACGIH (American Conference of Government Industrial Hygienists) for manganese exposure limits. Coreweld C6 LF has more than 50 percent lower manganese content and is designed to provide excellent operating qualities while significantly reducing the manganese levels in the welding fumes when compared to standard metal-cored electrodes of the same classification. ESAB's optimized formulation aids users in their efforts to reduce exposure to manganese in the welding environment while providing good mechanical properties and low weld metal diffusible hydrogen levels. Coreweld C6 LF offers the same enhanced features of ESAB's standard Coreweld C6 with welder-friendly operating characteristics, including consistent arc stability, very low spatter, good bead shape and minimal clean-up in an easy-to-use wire.

www.esabna.com

PalmScope Video Inspection System

The PalmScope (DCS950) from General Tools & Instruments is a pocket-sized video inspection system built to survive harsh environments of vessel maintenance and offshore maintenance. The clamshell design allows the camera-tipped probe to be coiled safely and conveniently inside the device. Retailing for less than $150, the video zoom button allows the user to zoom up to 4X, increasing the odds of spotting problems.

www.generaltools.com

J D Neuhaus Hydraulic Lifts

J D Neuhaus has added Profi and EH monorail hoist ranges, units providing 75 and 100 metric ton lift capacities, to their offerings. Where heavy loads are lifted and transported in restricted spaces with only minimum headroom, then a JDN ultra-low monorail hydraulic hoist range has been introduced, initially available with 50 and 100 metric ton lift capacities.

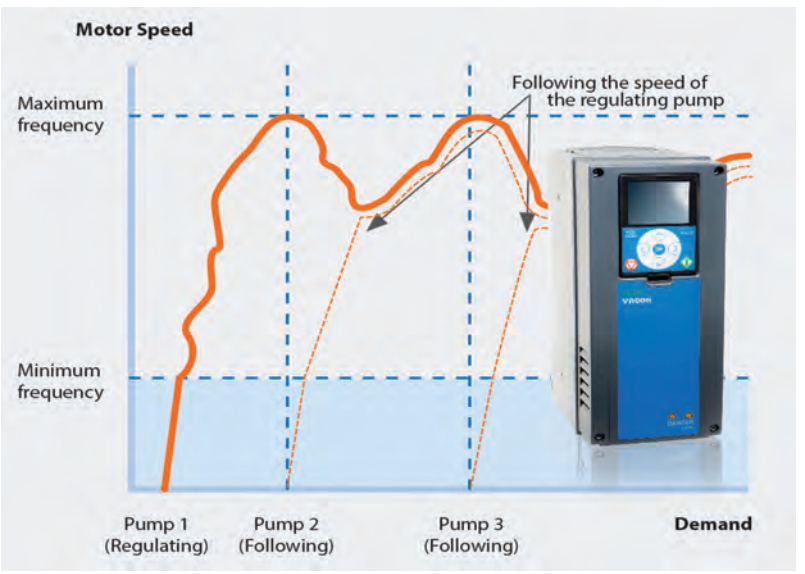
www.jdngroup.com

Flow Control for Multi-pump Applications

The VACON 100 FLOW is an AC drive designed to improve flow control for multi-pump applications in which several pumps are used in place of a single one. Multiple pump solutions help lighten the load by spreading it across several pumps, thus offering greater energy efficiency and system redundancy – if one pump fails, the others can take up the additional load. For operations in which demand fluctuates throughout the course of the day, such as a municipal water system providing peak water consumption in the morning and minimal usage at night, the VACON 100 FLOW offers unsurpassed control of flow and pressure for a maximum of eight pumps (or fans) without the need for an external controller — communication between drives is provided by integrated RS-485. The VACON 100 FLOW AC Drive is equipped with built-in Ethernet as standard.

The VACON 100 FLOW offers three multi-pump control solutions: single drive multi-pump, multi-drive multi-master and multi-drive multi-follower. For single-drive installations, one AC drive controls a lead pump. If demand exceeds the capabilities of the pump, additional fixed-speed pumps are brought online directly or with a soft starter. The VACON 100 FLOW allows the user to choose between fixed setups and solutions in order for the lead and auxiliary pumps to alternate roles to equalize wear and tear. In multi-master mode, each pump is controlled by its own AC drive.

www.vacon.com



BUYER'S DIRECTORY

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

ALUMINUM BOATS

Brunswick Commercial and Government Products, 420 Megan Z Avenue, Edgwater, FL 70518, USA , tel:(386) 423-2914, BCGPINFO@WHALER.COM

ANCHORS & CHAINS

Anchor Marine & Supply, INC., 6545 Lindbergh, Houston, TX , tel:(800) 233-8014, fax:(713) 644-1185, sales@anchormarinehouston.com

DCL Mooring and Rigging, 4400 North Galvez Street, New Orleans, LA , USA , tel:504 941-4116, fax:504 947-8557, codys@dcl-usa.com contact: Cody Schnuriger, www.dcl-usa.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

BOAT BUILDING AND DESIGN

Moose Boats, 274 Sears Point Road Port Sonoma Marina, Petaluma, CA , USA , tel:(707) 778-9828, fax:(707) 778-9827, abbie@mooseboats.com contact: Abbie Walther, www.mooseboats.com

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

COATINGS/ CORROSION CONTROL/ PAINT

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

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

DIVING & SALVAGE

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

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

DRILLS

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

DRIVESHAFTS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 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 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

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

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

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

LIFESAVING EQUIPMENT

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

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

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

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

MILITARY PATROL CRAFT MANUFACTURERS

Brunswick Commercial & Government Products, 420 Megan Z Avenue, Edgwater, FL 80204, USA , tel:(386) 423-2900, kelsey.nemeth@whaler.com , www.brunswickcgp.com

NAVAL ARCHITECTS, MARINE ENGINEERS

Aveva Solutions Ltd, High Cross, Madingley Rd, Cambridge CB3 0HB, UK , tel:Tel +44 1223 556655 , www.aveva.com

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

PIPE FITTINGS/CUTTINGS/CONNECTING/ SYSTEMS

Tube-Mac Piping Technologies Ltd., 853 Arvin Avenue, Stoney Creek 32168, Canada , tel:(905) 643-8823 , x119, fax:(905) 643-0643, chris.peitchinis@tube-mac.com

PROPULSION CONTROL SYSTEMS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

PROPULSION EQUIPMENT

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

PUMPS

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

RIBS & INFLATABLE BOATS

Wing Inflatables, 1220 5th Street, Arcata, CA , USA , tel:(707) 826-2887, ewing@wing.com , www.wing.com

ROTATING EQUIPMENT

Sohre Turbomachinery, Inc., 128 Main Street, Monson, MA , USA , tel:413-267-0590, fax:413-267-0592, tsohre@sohreturbo.com

RUST AND PAINT REMOVAL

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

SALT REMOVING PRODUCTS

Holdtight Solutions, PO Box 27907 Houston, TX 77227-7507 , tel:713 266- 9339, sales@holdtight.com

SEA AND AIR FREIGHT

Amerijet International, Inc., 3401-A NW 72nd Ave., Miami, FL 07001-0030, USA , tel:844-859-2016, sales@amerijet.com , www.amerijet.com

SEALS

Seco Seals, Inc., 1370 Logan Ave. Unit K, Costa Mesa, CA 63110, USA , tel:(714) 546-3478, secoseals@aol.com

SHIP REPAIR

Advanced Mechanical Enterprises, 217 SW 28th Street, Fort Lauderdale, FL 98052, USA , tel:(866) 377-0770, fax:(954) 527 – 0338, Christine@amesolutions.com

SHIPPING CARGO

Amerijet International, Inc., 3401-A NW 72nd Ave., Miami, FL 07001-0030, USA , tel:844-859-2016, sales@amerijet.com

STEEL, PIPE, ALUMINUM & ALLOY SURPLUS - PURCHASING

Texas Iron & Metal, 865 Lockwood Drive, Houston, TX 36652, USA , tel:713-672-7595, fax:713-672-0653, maxr@texasironandmetal.com contact: Max Reichenthal, www.texasironandmetal.com

STEEL, PIPE, ALUMINUM & ALLOYS

Texas Iron & Metal, 865 Lockwood Drive, Houston, TX 36652, USA , tel:713-672-7595, fax:713-672-0653, maxr@texasironandmetal.com contact: Max Reichenthal, www.texasironandmetal.com

STEERING GEARS/ STEERING SYSTEMS

Jastram Engineering, 135 Riverside Drive, North Vancouver, BC,, North Vancouver , Canada , tel:(604) 988-1111, fax:(604) 986-0334, dholme@jastram.com

SURFACE PREP TOOLS

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

TRAINING

Freelance Software, 39 Peckham Place Bristol, RI 02809, Bristol, RI , USA , tel:(401) 556-1955, fax:(401) 396-9717, chris@hawsepipe.com contact: Christopher Dady, www.hawsepipe.com

TRANSMISSIONS

Centa Corporation, 2570 Beverly Drive #128, Aurora, IL 48331, USA , tel:(630) 236-3500, fax:(630) 236-3565, bobl@centacorp.com

VACUUM TOILET SYSTEM

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

VIBRATION ANALYSIS

Advanced Mechanical Enterprises, 217 SW 28th Street, Fort Lauderdale, FL 98052, USA , tel:(866) 377-0770, fax:(954) 527 – 0338, Christine@amesolutions.com

WATER JET SYSTEMS

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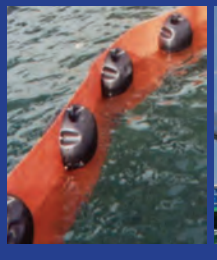

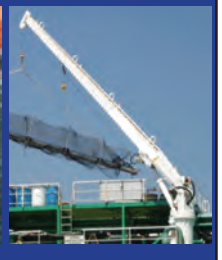

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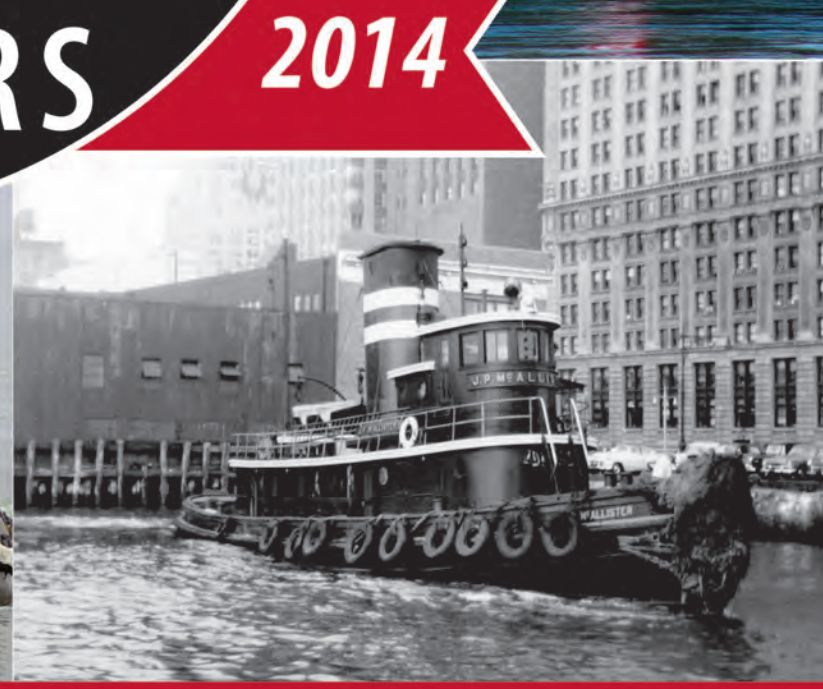

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