The Information Authority for the Workboat • Offshore • Inland • Coastal Marine Markets

Volume 30 • Number 7

Marine News

JULY 2019

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Propulsion Technology

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ON THE COVER

Vessel operators are faced with many choices when it comes to deciding today what tomorrow's propulsion will look like. The hybrid option is certainly one to consider. The story begins on page 28.

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We have, within this edition of ***MarineNews***, many topics to cover; each as important as the next. These include our headliner of propulsion technology – a rapidly expanding subject – as well as safety and fire prevention, and the discussion surrounding ballast water treatment and as many as 26 other so-called 'incidental' vessel discharge streams. Within this folio, it is all there, and more.

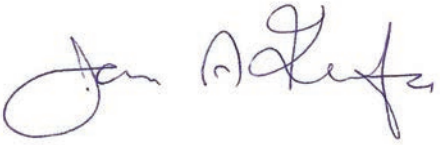
Circling back to marine propulsion, today's climate (pun intended) may well be the most disruptive environment for this critical area of global shipping that we have seen in decades. Never before has waterborne commerce seen more in the way of environmental mandates and, as it turns out, choices to ponder when it comes to propulsion decisions that will ultimately impact tomorrow's bottom line.

EPA Tier IV solutions, so-called 'Tier beater' arrangements, hybrid, LNG, hydrogen fuel cells and fully electric vessels are all being contemplated and developed. None of this is pie-in-the-sky; it is on the water and impacting every sector of commercial marine operations. Our ***INSIGHTS*** focus for this edition, ABB's Ed Schwarz, leads an in-depth discussion of what is coming, why, and how we will ultimately reach the Promised Land. And, then, there is another way to go.

A whopping 17,596 vessels in the domestic commercial fleet are now older than 21 years, and 61% of all U.S. self-propelled vessels are older than 25 years. The vast majority of these vessels are propelled by out-of-warranty engines. Many operators, also dealing with the advent of subchapter M regulations, find themselves looking at refurbishing legacy engines that have proven to be so far robust, and viable for the foreseeable future. Servicing that sector in an economical fashion, while also providing part of the environmental solution, is Cleveland-based Interstate-McBee, who for 72 years has been producing critical engine parts for OEM and replacement service alike. That story begins on page 31.

Ultimately, much of the pressure impinging upon the workboat sector involves new regulatory mandates that regulate emission requirements as well as virtually every single possible substance that might emanate from any vessel. Hence, if this issue is chiefly about propulsion – and we cover it broadly within – it also about improving the environmental signature of the marine industry as a whole. This can take the shape of using the right lubricants, compliance with the new VIDA law and, of course, training our personnel to ensure a safer operation.

On the water, launching the nominally compliant vessel will never be enough. Our first Marad Chief, Joseph P. Kennedy, said many years ago, *"You can have a Merchant Marine with first class men even if they sail second class ships, but second class men can't be trusted with the finest ships afloat."* That's no less true today than it was when he said it more than 60 years ago. Hence, this month's look at the unique training partnership between Florida Marine Transport and Delgado College's Maritime, Fire and Industrial Training facility, beginning on page 40, is equally important. See if you don't agree.



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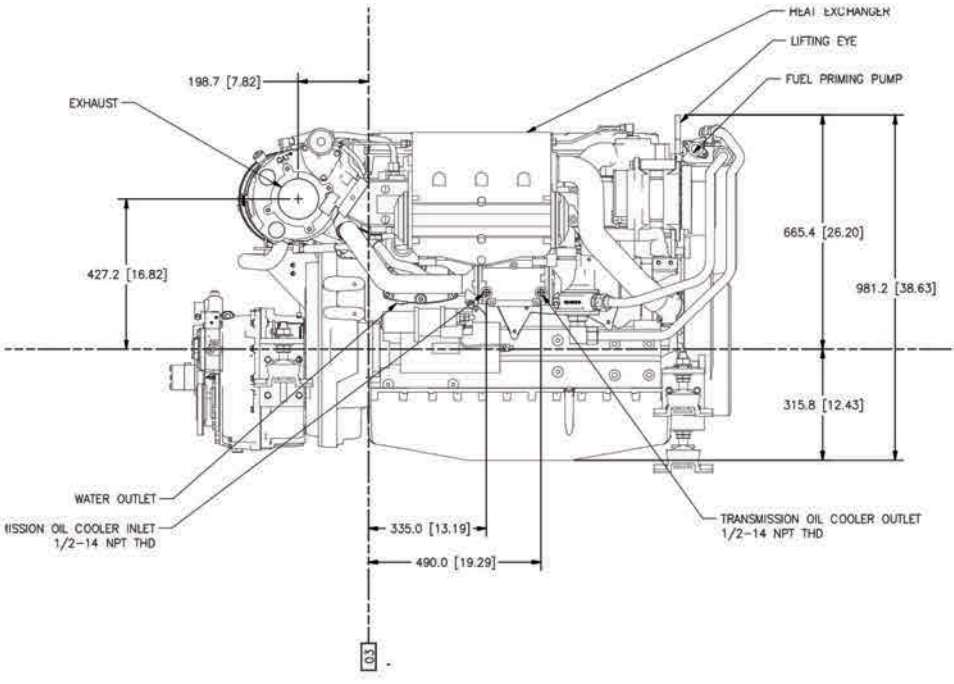

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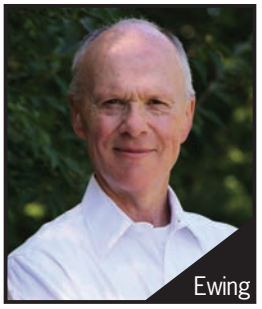
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Marcon's View of the Workboat Market

There is more than one way to measure domestic and international workboat markets. Arguably, there are few brown water stakeholders that track, report and monitor this broad shallow draft sector closer than does Marcon – the West coast-based broker who, since its first sale in 1983, has sold/chartered over almost 1,500 vessels and barges, specializing in the towing, marine construction and offshore petroleum industries. This month, in our propulsion technology edition, we appropriately focus on their unique habit of tracking the engine OEM of each of the vessels they broker and/or track. It is, in many ways, a telling compilation. And, as shown below – there are any number of ways to rate the herd. Accordingly, keeping track of key data of all kinds has always been key to Marcon's success.

Tug Market Report (Feb / 2019): Of the 13,424 vessels and 3,691 barges Marcon tracks, 5,038 are tugs with 547 officially on the market for sale worldwide, down 38 or 6.50% from one year ago, February 2018, and down 140 or 20.38% from February 2014. The oldest tug Marcon currently has listed was built in 1907 and was originally built to tow coal barges and provide fuel for the Reading Railroad. This "old lady" is balanced by 13 newbuildings between 265BHP and 5,200BHP scheduled for delivery in 2019. Six newbuildings are azimuthing, with five traditional twin screw and two small single screw tugs.

Five years ago, 31.30% of tugs for sale worldwide, primarily foreign flag, were built within the previous 10 years compared to 29.98% today. Five years ago, 9.02% of the tugs on the market were 50+ years old compared to 12.98% today. *The fleet – especially here in the United States – is getting older.*

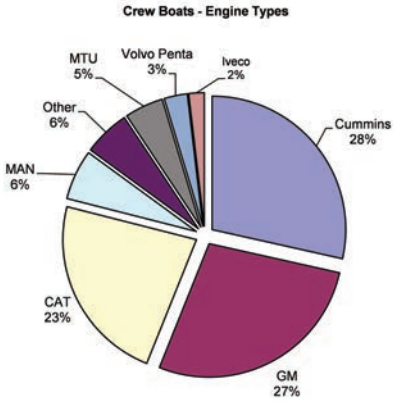
The majority of tugs Marcon tracks for sale are in the US with 135 tugs officially on the market (159 one year ago). CAT diesels still power most of the tugs that Marcon tracks with machinery in 158 or 29% of the tugs listed. This is followed by 70 vessels with EMDs, 60 Cummins, 46 Yanmar, 37 Niigata, 20 Mitsubishi and 19 each GM/DD and Wartsila powered tugs. 118 tugs are powered by machinery from other manufacturers from Akasaka to Volvo with two Fairbanks Morse boats still on the market.

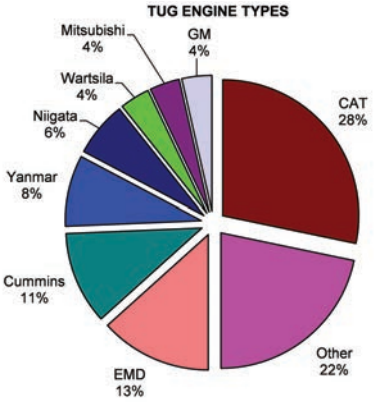
Looking at it another way, conventional twin screw tugs still prevail, with 341 (62.3%) available. These are followed by 121 azimuthing (22.1% - and growing), 67 single-screw (12.2% - and shrinking), ten triple screw (1.8%) and eight Voith Schneider tractors (1.5%). As a comparison and demonstrating the trend in propulsion, five years ago 22.0% of the 687 tugs for sale were single screw, 58.2% twin screw, 16.4% azimuthing and 0.4% VS tractor tugs. More ASD tugs are being listed today worldwide than single screw tugs as ASDs become more common worldwide. It is difficult to get a precise figure handle of tugs, mostly older single and twin screw, being scrapped, but Sea-Web reports 1,497 tugs worldwide broken up or to be broken up. *This is up 9.49% from August 2018's 1,365, when Marcon began to track this figure.*

Marcon sold three tugs so far this year with averaging 31 years old and at an average of $904.22/BHP, but as the year goes on, they expect price/BHP to fall. As of end of February, Marcon's Sales-to-Asking-Price ratio was 86.32%, higher than 2018's 77.79% and 2017's 81.49%. Marcon's 2019 sales to date have been within the US with one US to foreign sale into Canada.

Crew Boat Market Report (March 2019): Marcon tracks 1,153 crew, fast supply & pilot boats, as well. Of those numbers, 218 are officially on the market for sale. About 34% of the boats officially for sale are U.S. flag. The market, of course, continues to remain extremely soft for all types of offshore service vessels, including crew boats, as the activity levels across the board for offshore oilfield markets continue to stagnate. Sales in this segment, says Marcon, are far and few between and at greatly reduced prices. *Utilization levels and rates do not justify any activity on behalf of the Owners, so a long term lay-up to wait out a market return is the general process, and it continues.* As brokers, Marcon generally sees an uptick each spring with cautiously positive pronouncements advising that the market is at the bottom and it looks like we are about two years away from a return to a better market. It's not clear as of yet that this will be the case in 2019, any more than it was the case in Spring 2017, or 2018.

For example, a typical sale might involve a vessel laid up since the drop in 2015. Dry-docking for Class or USCG is due, and the original asking price has continued to depreciate until a deal – often 25% of the original asking level post 2014 high water mark – can be made. *Sales of older units are effectively nonexistent. Sales of newer vessels with high book values don't really exist as those parties continue to try and wait out the market.* According to Marcon, it will continue to take time to reduce the excess capacity regardless of the turnaround point in the market, and if the turnaround is two years' away, then the competition from lower priced vessels acquired during the downturn will plague those fleets with high book values, and companies reorganized in bankruptcy. The competition will be tough





for a long period of time as a result, and this will continue to haunt the industry's recovery efforts well into the future.

Sea-Web reports 29 crew & pilot boats broken up, to be broken up or scuttled. 1,133 offshore support vessels of all types are also meeting this fate. Where vessel location is known, 75 boats for sale are in the United States. Of the crew, pilot boats and launches listed, the most popular engine is Cummins in 61 of 214 boats where engines are given, followed by 59 GMs, 49 CATs, 13 with MANB&Ws, 10 MTUs, 6 Volvos, 4 Ivecos and 12 other types, ranging from DAFs to Yanmars. Boatbuilding in this sector continues to be predictably moribund. *As of December 31, 2018, Colton Co. reports that no crew boats were delivered by U.S. shipyards in 2018,* compared to four in 2017, five in 2016, nine in 2015 and 11 in 2014.

Inland Pushboat Market Report (February 2019): Inland river push boats officially on the market for sale in total is 109, up six from Marcon's last report (8/2018). As of this report, only 8.26% of the push boats available are less than 10 years old, significantly less than the 16.82% reported one year ago and the 16.47% reported five years ago. In looking at overall fleet age and then by U.S.-flagged versus foreign flagged, over the past five years we can see a distinct increase in the age of push boats on the market. Five years ago, the average age of all on the market through Marcon was 42 years, compared to 43 years one year ago and 46 years as of this report. That is driven by older U.S.-flagged vessels going on the market, aging from 45 years in 2014 to 46 years in 2018 then to 48 years in 2019 (significantly older than foreign vessels in this sector which average 34 years as of this report date).

Of the vessels listed for sale, CAT engines are most popular with machinery in 31 vessels. These are followed by 22 each with Cummins and GM / Detroit Diesels, ten with EMDs, seven with Mitsubishi and eight with other engine types ranging from Akasaka to Mercedes.

The market remains fairly flat. *Consolidation in the inland market, such as Kirby Corp's recent acquisition of Cenac Marine Services, has pushed older units onto the market that are surplus to the acquirer's needs.* With new and pending regulations, Marcon expects the increase to continue, at least until owners start scrapping due to lack of buyers. Prices are likely to be below owner's "book values", if not at scrap levels. Marcon has also recent cases of owners having to pay the scrappers. Subchapter M certifications are starting to proceed, but, says Marcon, the USCG is backed up with all the applications, etc., which need to be processed, etc.

Under U.S. law, vessel operators must report domestic waterborne commercial movements to the U.S. Army Corps of Engineers' Waterborne Commerce Statistics Center. February 2019's 39.5 million short tons of all commodities carried on internal U.S. Waterways was 18.05% less than the 48.2 million short tons carried in January, 10.02% less than carried same month 2018 and the lowest February since February 2014's 32.5 million short tons. Year-to-date tonnage carried is 87.7 million short tons, compared to 2018's year-to-date tonnage of 88.9 million short tons, a decrease of 1.35%. February 2019's 11.3 million short tons of petroleum carried was the lowest month since November 2011's 11.3 million short tons. Coal and coke at 10.0 million short tons moved in February is the lowest month since we started tracking this information in January 2010. *Total short tons moved year-to-date 2019 is 2.25% below same period 2018.* Hence, overcapacity in this market continues. Peter H. Stephaich Chairman and CEO of Campbell Transportation Company, answering our question about market conditions in this sector, told ***MarineNews*** in February of this year, "The supply and demand must come into equilibrium. Economics 101." Sounds like not much has changed.

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Edward C. Schwarz

Vice President of Sales, New Builds, ABB

Based in Miramar, FL, ABB Vice President Ed Schwarz is today responsible for developing and leading the newly created new sales team for ABB in North America. He is the firm's leading advocate for new build opportunities in US and Canada and more importantly, developing the business strategy necessary for bringing hybrid and electric solutions to North America market. A graduate of the U.S. Merchant Marine Academy at Kings Point, NY, he earned a Bachelor of Science in Marine Engineering and Shipyard Management in 2000. Additionally, he served in United States Navy as Lieutenant, US Naval Reserve until 2011. He served at sea in a variety of engineering roles and has earned his Chief Engineer's license. Prior to joining ABB, he also worked for ZF Marine Propulsion Systems and Voith Turbo Schneider Propulsion, where he managed and promoted technical and practical aspects of those respective marine divisions. As ABB takes a pole position in the quest to clean up the environmental footprint of marine vessels, and Schwarz is at the tip of the ABB spear when it comes to implementing that strategy. Listen in this month as leads a discussion into the greener and more fuel efficient future of the marine industry.

You have been quoted as saying, "Prior to every major adoption of technology in the US inland river market there is a perfect alignment of opportunity and solution." Tell us why inland operators are finally ready for hybrid and/or electrification of propulsion.

Just as the diesel engine superseded steam and steam did the sail, the combined benefits of the electric propulsion represent the next generation of towboat for the US inland water¬way, from which there is no going back. Once owners enjoyed the benefits of lighter, more reliable diesel engines they stopped building large and dangerous steam boilers for inland vessels. Once the US inland owners start to enjoy the benefits of diesel electric propulsion they will not look back favorable on the disadvantages of diesel mechanical systems. At a time when speculation in shipbuilding and slow economic growth continue to haunt the maritime sector, owners find themselves under continuous pressure to minimize costs by maximizing operating efficiency. Shipping has also come under increasing scrutiny from regulators and environmental bodies over its environmental, with emissions from ships the number one concern. Recently introduced NOx emissions rules mean that conventional diesel mechanical marine engines can only meet EPA Tier 4 performance requirements by adding expensive, bulky, heavy, complex and hard to maintain aftertreatment - either costly Exhaust Gas Recirculation (EGR), or Selective Catalyst Reduction (SCR) using urea on board. Alternatively, inland operators should consider diesel electric propulsion, which is not only increasingly preferred by global shipping but which can meet Tier 4 standards using Tier 3 main engines, without the need to devote space, engineering time or finding bunker calls for urea.

Everyone wants to be 'green,' but most won't go that way until it also produces green for the bottom line. Share some of those competitive advantages that will eventually propel inland operators to make the switch.

The new regulations covering emissions from US inland vessels have major cost implications for owners looking to build new vessels, at a time when there is a significant requirement to replace an aging river fleet. The costs involved are significant enough to prompt considering the ROI of alternative technologies. The 'conventional' option involves installing two large EPA Tier 4 main engines

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supplemented by an after treatment system – either the costly EGR option or SCR that features additional piping, its own refill and urea storage tank and demands separate maintenance. There is no likelihood that investments in after treatment technology can be recovered from shipping contracts. Alternatively electric propulsion provides the ability reduce the major operating costs of engine maintenance and fuel. A vessel that spends 40% of its operation time at less than 50% propulsion load can be worked using two engines instead of three when compared to a mechanical driven system. This capability results in fuel economies when engines are under part load. But even more importantly, owners can reduce total engine running time by up to 50% – significantly reducing engine maintenance.

Is a retrofit to diesel electric and/or battery operations feasible for existing boats or is this trend primarily best suited for newbuilds?

The retrofit market is the largest market in the US due to the cost of construction for new vessels. Everyone knows that the US keeps vessels the longest of any other market. This creates a lot of interest in bringing new technologies to existing vessels. There is no limitation to retrofit except space and weight but usually this equipment can be fitted in unused areas like top decks or lower utilized spaces. An example of a very successful major retrofit is the Tycho Brahe and Aurora which have been converted from conventional diesel engine operations to battery power as part of For-Sea's strategy to reduce the environmental footprint along the 4km route between Sweden and Denmark. The vessels operate on a high intensity ferry route that transfers over 7.4 million passengers and 1.9 million vehicles between urban port terminals in Denmark and Sweden. The conversion of these over 100-meter ferries, both built in 1991, required installation of a 4160 kWh battery on each vessel, as well as battery racks, energy storage control systems and ABB's Onboard DC Grid power distribution technology. Additionally, ABB supplied automated shore-side charging stations using an industrial robot to optimize the connection time and maximize the charging period, leveraging 3D laser scanning and wireless communication between ship and shore. This is a landmark project, and we are convinced it will come to be seen as a critical step in shipping's environmental revolution, as well as a milestone in rolling out ABB's 'Electric, Digital, Connected' strategy for shipping.

Niagara Falls tour operator Maid of the Mist has ordered two new passenger vessels sailing on pure electric power, enabled by ABB's technology. Flesh out that propulsion system and its components for the readers.

The Maid of the Mist project is truly revolution because the vessel will not be fitted with ANY engines – it is truly all electric and the fact the electricity comes from the local hydro dam means a true zero emission vessel. ABB has been tasked with providing a completely integrated solution that takes power from the utility, manages it and delivers to the L-drives and bow thrusters. In addition to integrating the ship-to-shore battery charging connection, ABB will supply the Maid of the Mist newbuilding project with switchboards, drives, batteries (from Spear), propulsion motors for both sets of stern and bow thrusters, and the integrated control system, as well as the ABB Ability Marine Remote Diagnostic System for remote equipment monitoring and predictive maintenance. ABB Ability is ABB's leading offering of digital solutions and services.

Credit: Maid of the Mist corp

In terms of the Maid of the Mist passenger vessels, give us an idea of the cost difference for these vessels had the operators opted, for example, for an EPA tier 4 solution?

The Maid of the Mist vessel would have probably been able to use multiply Tier 3 engines (less then 800HP each) thus staying below Tier 4 requirements. But even compared to Tier 3 propulsion solutions there is a financial benefit to the owner to go full battery electric. When an owner makes the decisive decision to go full battery electric they are enjoying benefits both on the initial design and operation. There is benefit in not just removing engines but also all the accompanying exhaust ducts, foundations, shaft lines, electrical connections, cooling, fuel lines, multiply pumps, and fuel tanks. The new ABB system for these types of vessels (ABB Onboard Microgrid) is a new compact-size solution, ABB makes similar efficiencies achievable for smaller, lower-power vessels operating over short distances that larger vessels have enjoyed for many years. Onboard Microgrid reduces the footprint and weight of the electrical equipment on board by eliminating the need for bulky transformers and main switchboards. That leaves more space on the vessels and provides greater flexibility in the positioning of system on board- thus saving money during design. The system is almost completely pre-engineered and self-contained. This saves costly time during the vessel construction period. But the real costs savings come during the operations by reducing many of the major costs of operation like engine maintenance and fuel costs. It also improves space and layout of the vessel allowing for in this case more passengers to enjoy the top deck without the stacks taking up space and spewing exhaust and heat. Lastly, if you are in the business of services to the general public one cannot underestimate the paradigm shift in where millennials will spend their money or support. Anyone who lives with, works with or knows millennials, is also aware that they are reshaping what is important in consumer culture- this includes environmental issues.

The two biggest sticking points for the use of batteries on commercial vessels have been, until recently, weight and/or the physical footprint of these units necessary to provide the required propulsion power. We've come a long way, haven't we? Tell us a little about the progress made on that front.

Marine batteries are to some degree rooted in "ESS systems" – containers full of batteries that provide peak shaving to power plants. Until recently, marine batteries used heavy, inflexible backplanes as the basis of their systems. The most advanced batteries on the market use easy connections with light, adaptable racking. This contributes to a reduction in weight and a footprint. We expect big advancements in two or three years from development in battery chemistry, but the myth that batteries have to be big and heavy has already been busted.

Each of the MoTM vessels will be powered by a pair of battery packs with a total capacity of 316 kWh, split evenly between two catamaran hulls. Having two fully independent power systems on board will increase the resilience of operations by creating a redundancy. Can the battery packs operate with just one unit if the other is unavailable for whatever reason? Is this sufficient to propel the vessel safely and if so, for how long?

This redundant arrangement is very important for an all-electric (no engine) system. Each hull houses enough power and both stern and bow thrusters to drive the vessel independently. This allows for true redundancy. As long as the vessel is able to recharge, the vessel can operate with a 50% loss of the system.

The European innovation project FLAGSHIPS has been awarded 5 Million Euros from the EU to support deploying two commercially operated zero-emission hydrogen fuel cell vessels in France and Norway. In France, a hydrogen pushboat operated by Compagnie Fluvial de Transport (CFT) will serve as a utility vessel on one of its most demanding rivers, the Rhône. Define the term 'utility' vessel. Will this truly be a workboat?

This is a major milestone in inland marine industry. It seems at times that the inland market is later to adopt new technologies – in this case, inland is on the vanguard of zero emission technology. The project is a retro fit of a push-boat for the transportation of cargo and moving barges. It pushes two barges and convoy lengths is up to 180 meters (~600 feet). The vessel's daily operation is inside the Port of Lyon manipulation barges and weekly operation moving barges between Port of Lyon and Docks Fulchiron. It is very similar to the typical US Fleeting operation in the lower Mississippi River that some times acts like a unit tow – by volume of vessels, this is properly the most common pushboat vessel operation in the US. ABB and Ballard Power Systems will leverage the existing kilowatt-scale fuel cell technologies and optimize them to create a pioneering megawatt-scale solution suitable for powering larger ships. With an electrical generating capacity of 3MW (4000 HP), the new system will fit within a single module no bigger in size than a traditional marine engine running on fossil fuels.

The diesel electric system decides how much power is needed. Hence, and for larger operators, the likelihood that one Captain or another will be labeled the 'fleet gas hog' can be eliminated. For its part, ABB claims as much as a 30 percent fuel savings. Flesh out those numbers for us.

Going with automated electric propulsion brings many advantages including automation. Our automation system allows the Captain to run his/her vessel as they normal would and the system then automatically decides how much power is needed and starts or shut-downs engines accordingly. It is important that the Captain have available all the install power to quickly maneuver his/her vessel. But we will also start to see Captains change the way they operate vessels once they have the instant toque of full power at zero speed that comes from a motor. Other markets, introduced to 'speed of throttle response and quick availability of standby power,' start to naturally operate the vessels in a more efficient and effective way. In a real life example, we calculated an owner to save about 15-25% fuel reduction using a diesel electric system. They reported about a 50% reduction in fuel used. When we interviewed the Captains they explained that due to their confidence in the standby power being available so quickly, they ran vessel at lower loads more frequently then in the past. The goal is not just installed horsepower but actual performance exactly when it is needed – this is the efficiency that a well designed electrical system can bring an owner.

ABB has already supplied over 1,300 vessels featuring diesel electric propulsion. When will we see the first inland pushboat using such technology?

Very soon. We are having very encouraging conversations with owners that believe the technology is a perfect fit for operation. Ultimately, it the vessel owners that need to see the value. These are conversations we are having today. The industry has been very accepting of learning about electric propulsion, asking probing questions and now looking for the opportunities to implement. We fully expect to see ETBs sailing in 2020.

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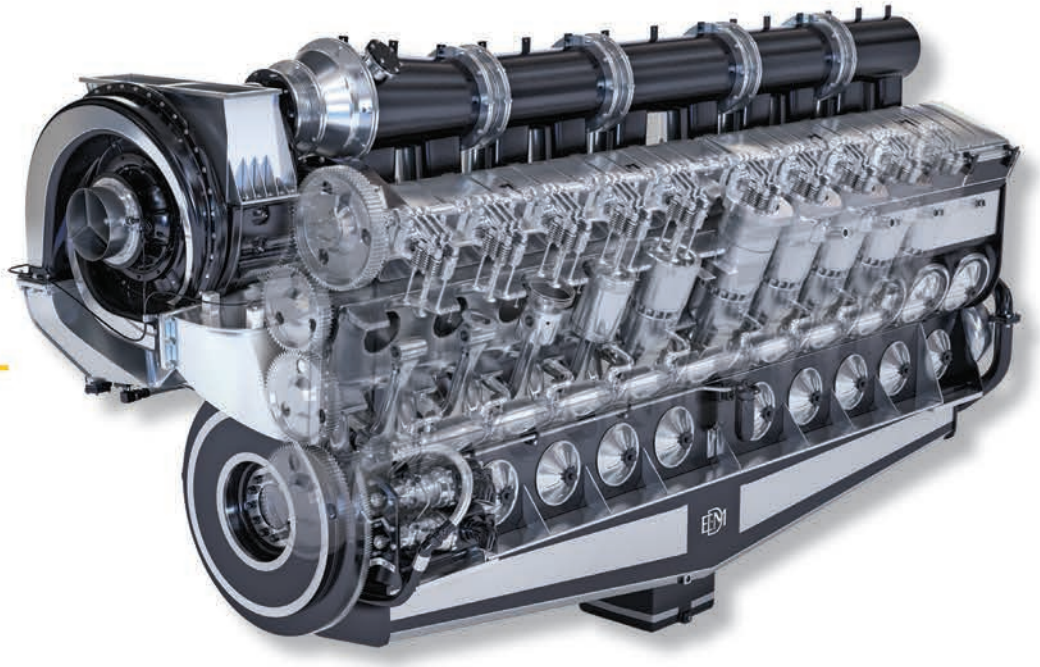

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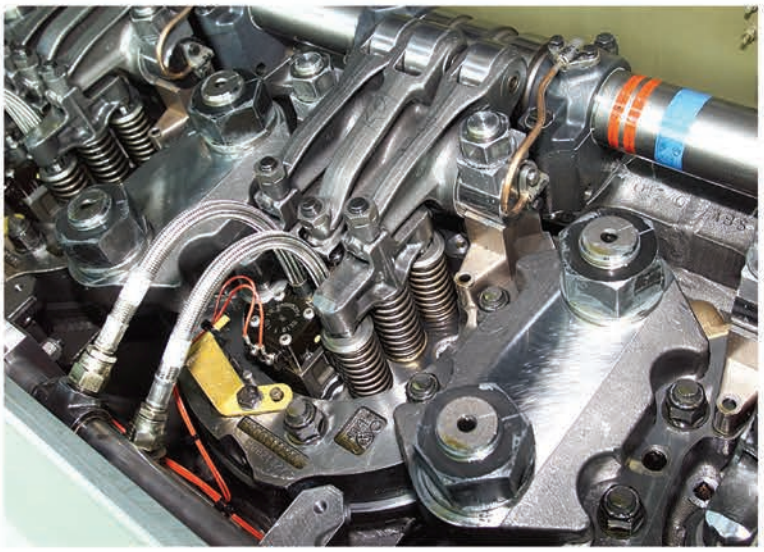

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Successful Sustainability Solutions Start with ... Lubricants

Unappreciated, but heavily used by operators and closely regulated by the authorities, lubricants can also be a welcome part of your environmental and sustainability program. That's right: lubricants.

By Ben Bryant

Bryant

When it comes to the ideal operating scenario on any marine platform, the challenge of balancing sustainability with maximum operational performance and arriving at a healthy bottom line has never been more difficult. That said; the arguably perfect solution involves using on board consumable product(s) that contribute to sustainability, operational, and energy efficiency goals. Does such a product even exist?

The answer may surprise you: it is lubricants. First, however, and to pursue these benefits; vessel operators, equipment manufacturers, naval architects, and classification societies will all need to shift how they assess the role of lubricating the mechanical elements used in the marine industry.

Traditionally, the role of lubricants has been viewed as a necessary component of mechanical systems while at the same time assuming the performance of the lubricant is similar across types and brands.

On the other hand, modern lubrication products and practices are driven by the science of tribology; a study of moving surfaces relative to one another and the friction, wear and (sometimes) ultimately, the damage that these machinations create. Utilizing elements of engineering, chemistry, and biology; the science of tribology leads to gains in sustainability through improvements in equipment design, longer equipment life span, increased energy efficiency, reductions in consumable material and direct and indirect improvements to the environment.

Sea Change: sustainability

When the EPA implemented the 2013 Vessel General Permit (VGP), the shipping industry necessarily increased its awareness of the impact on water quality from lubricants lost through routine operational discharges. Lubricants used in oil to sea interfaces and on equipment subject to emersion must now be non-toxic, biodegradable, and non-bioaccumulating to meet the EPA's standard to qualify as an environmentally acceptable lubricant (EAL). In the six years since the permit requirement went into effect, at least 16 lubricant manufacturers have launched EAL

Credit: Kluber

portfolios of product and every major equipment manufacturer (OEM) of vessel propulsion systems has developed an EAL response. The EPA VGP reporting database for 2018 lists over 200,000 vessels with 95,000 EAL applications. Hence, EALs are now an important part of any vessel sustainability program.

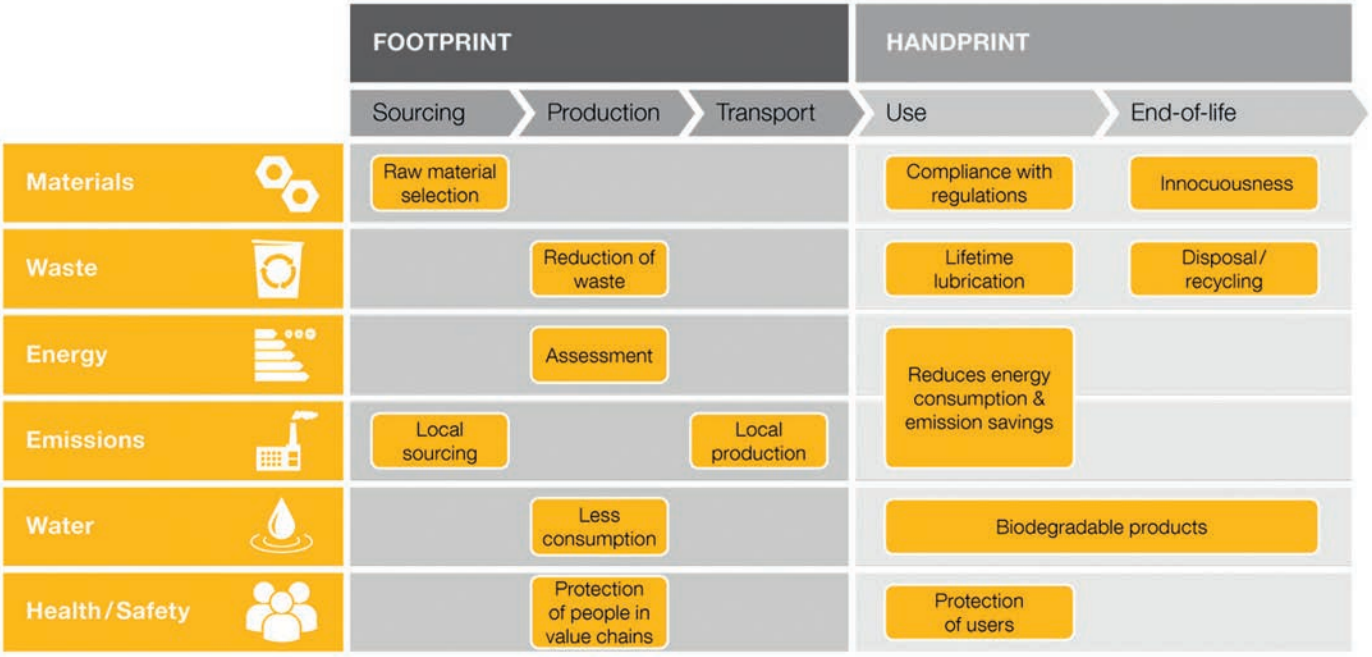
To look beyond direct environmental benefits of lubricant choice brings the owner/operator into the realm of lubricant performance. Worldwide, consumers of energy utilize approximately 103 exajoules (1 EG = 1 quintillion joules) annually to simply overcome friction. Another 16 EJ is used to remanufacture worn parts. Combined, energy used to overcome tribological contact accounts for approximately 23% of total world energy production (Holmberg, K. & Erdemir, A. Friction [2017] 5: 263. https://doi.org/10.1007/s40544-017-0183-5). It is easy to see that the proper use of specialty lubricants combined with advances in industrial design will in the future play a major role in reducing energy consumption in the maritime industry.

Land-based mechanical systems with constant loads and operated in stable environments allow for accurate measuring of energy inputs and outputs. Consider the oil now used in high performance car engines and how it extends the life of the engine and improves performance. In manufacturing, Klüber Lubrication is working with customers to reduce energy consumption through detailed analysis of industrial gearbox arrays where in some cases a 15% reduction in energy consumption can be realized simply by choosing the correct lubricant.

Efficiency improvements on vessels are available, but they may be harder to document. Propulsion and cargo systems are influenced by changing environments, variable operating requirements, and operator preferences. Capturing actual energy savings from incremental change is difficult but theoretically available. For example, container ships carry hundreds of individual refrigerated containers each with its own compressor unit. The operational gain from replacing one compressor with an energy efficient unit running on synthetic compressor oil may be small, but if all the compressors used PAO based compressor oils, the savings in energy consumption and waste reduction would be sizable.

Klüber's Role

An example from Klüber's contribution to the marine industry is seen in an improved gear oil used in POD propulsion that extends the life of the oil, reduces damage to the components and reduces downtime of the



A partial list of sustainability improvements affected from the choice and proper application of EAL lubricants:

Water quality and air emissions	*Reduced energy usage based on friction reduction*	*Waste reduction from longer lasting lubricants*
Years of service of the equipment	*Use of equipment using smaller shafts, bearings, gears*	*Consumable savings from lower usage rates*
Transfer of power in hydraulic systems	*Specific lubricants for composite and elastomer materials*	*Reduced air emissions due to better engine oils*

vessel. Theoretically, customers are also reducing energy usage by up to 2%, but this is not easily measured due to the variability of the operations.

A second example from the Klüber portfolio is an improved ATB coupling grease. This is a 'lost in use' grease application with high utilization rates. Bench testing of the Klüber Lubrication product on tribological test rigs indicates a reduction in friction, increased life of the product and reduced damage to the components. In the field, consumption rates have been reduced by 20% to 50%. An additional benefit is the significant reduction in the noise generated by the bearings, leading to increased crew comfort.

A common term used to describe the impact on the environment from an individual or operation is the ecological footprint. By adding up the materials used, the waste generated, the energy consumed, the impact on air and water quality, and the impact on health and safety of humans, an assessment of the total environmental footprint can be estimated.

To take this concept one step further is to assess the environmental footprint that the person or operation contributes to the sustainability goals and actions of other individuals and organizations. At Klüber Lubrication, the above chart is used to conceptualize the firm's role in the footprint/handprint of sustainability contributions. That footprint includes all the impacts from procurement of materials, production processes, and delivery to the consumer. Our "handprint" can be measured by the impact we have on helping customers achieve their sustainability goals.

As marine professionals, you can advance sustainability goals through the application of tribology and lubricants. Vessel designers and architects can promote the role that lubricants play in achieving sustainability goals by incorporating energy saving and equipment design into their vessel concepts. Equipment manufacturers can test lubricants during the product development phase and provide guidance to end users on lubricant specifications. Operators can investigate lubricant options based on total costs of operation and reducing the "footprint" of the vessel.

Ultimately, marine organizations must recognize the value of lubricants in the overarching search for achieving operational efficiency, environmental and sustainability goals. Whatever the sustainability goals are for your organization, consider the impact lubrication has on total energy consumption and the life of your equipment. By designing modern lubrication practices and products into the operation you will contribute to an improved bottom line and a better world.

***Ben Bryant** is Marine Market Manager at Klüber Lubrication. A graduate of the Massachusetts Maritime Academy, he is a long-time contributor to our pages.*

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A Measured Response:

The Offshore Sector's Support of National Interests in Times of Crisis

By Chad Fuhrmann

Fuhrmann

Desperate Times Call for Diverse Resources

In 2017, North America was assaulted by significant weather events resulting in cascading humanitarian crises. Despite the substantial response from the U.S. maritime industry, a misconception arose that insufficient U.S. assets were available to support critical response activities in affected regions; in particular, Puerto Rico and the U.S. Virgin Islands. Public perceptions – fed by a general lack of understanding – combined with a demand for action from the Administration resulted in unnecessary Jones Act waivers. Under the auspices of crisis response, foreign-flagged assets were given access to a national market which could have been provided for on a shorter timescale by available U.S. flagged OSVs.

The reaction to these circumstances made it apparent that efforts are needed to raise government and public understanding of the industry's capabilities and, in turn, the industry's awareness of the needs of entities requiring its services. Agencies responsible for disaster response remain uninformed of the extent of the available resources and have failed to successfully engage the industry in dialogue aimed at creating a better understanding. Meanwhile, the offshore industry continues to evolve, developing more wide-ranging skills and technologies but shares fault in neglecting to effectively bridge the gap between perception and reality.

To begin the process of resolving this disparity, the National Offshore Safety Advisory Committee (NOSAC), by direction of the U.S. Coast Guard, launched the Response & Recovery Activities Subcommittee in late 2018. The intent of the Subcommittee is to lay the foundation for a cooperative relationship between industry, government agencies, and the national interests which they all serve. Consisting of representatives from across the offshore sector, the Subcommittee's remit was – and continues to be – providing guidance and recommendations to the USCG regarding the effective use of OSVs during times of crisis.

Response does not have to be the "Second Disaster"

U.S. flag maritime resources (across industry sectors) are capable of multiple functions that can effectively support any disaster response scenario. These capabilities are as diverse as the assets themselves and are therefore difficult to categorize throughout the available fleet. Nevertheless, it is capturing and understanding those characteristics that is the key to developing an efficient and effective response.

OSVs are particularly capable of a wide variety of functions – by design and innate ability to perform operations within the maritime environment. The capabilities, of course, are not limitless. Unfortunately, both the strengths and limitations of OSVs are only partially attributable to their physical capabilities. Some restrictions are imposed based on U.S. regulations, international law, and class rules. Application (and at times, interpretation) of these criteria may restrict vessel operations based not on response capabilities but rather on regional restrictions on operations and personnel, effectively disqualifying capable assets that would otherwise be immediately available.

In addressing these issues, the Subcommittee relied heavily on the precedents set by existing standards. With

Credit: OMSA

The OMSA fleet's bench is deep, and it is ready.

appropriate updates, current policies and procedures satisfactorily describe the strengths of OSVs and adequately address anticipated risks. Additionally, existing standards for personnel have established a history of safe manning across a wide array of operations.

Most importantly, during times of humanitarian crises, these standards effectively represent a practical assessment of risks that will allow for a safe and immediate response using capable resources.

The TRV Solution

Given the diverse capabilities of the Jones Act fleet as well as the regulatory environment in which they operate, the efficient employment of these resources in disaster response remains a complex undertaking. As a proposed solution, the NOSAC Subcommittee's ongoing work involves defining a new endorsement for eligible OSVs – the Response, Restoration, and Recovery Vessel ("Triple-R," or "TRV") endorsement. This endorsement is intended to expand the pool of U.S. flagged vessels available to state and federal agencies for disaster response operations minimizing any possible need for Jones Act waivers.

Owners will not incur any additional cost for the endorsement, but vessels must undergo an assessment of their legal qualifications and ability to safely accomplish response related activities based on existing, immediate capabilities. Despite its crisis-response objective, such an endorsement would likely create a perceived threat to existing commercial interests. To address this, the TRV endorsement would be allocated to vessels on a graded scale (TRV 1, 2, 3) and would be applicable only during times of an officially declared disaster. While the endorsement would supersede other operating restrictions, it would only be applicable for limited durations and within certain operating areas.

Obligation vs. Opportunity

The U.S. maritime industry serves as a lifeline to the nation and the globe at all times, but particularly during times of crisis. It carries the capabilities to respond to such emergencies with existing resources. However, these capabilities extend across the greater maritime industry and cannot be ethically monopolized in the hope of commercial gain.

While the U.S. Jones Act fleet of OSVs service primarily the contiguous United States, it too recognizes and demonstrates its obligation beyond arbitrary boundaries and commercial interests. Based on its regional distribution and myriad capabilities, the OSV sector represents a crucial piece in the nation's immediate response to natural or manmade disasters, and strengthens the critical resources that the greater industry offers. Versatile OSVs are capable and willing to collaborate across industry sectors to assist in developing efficient and effective processes that facilitate an equally efficient and effective response to those in need.

Participation in the Subcommittee's ongoing efforts is open to all interested parties. More information, including the official NOSAC Task Statement and interim report can be found through the USCG Homeport site at https://homeport.uscg.mil/.

Chad Fuhrmann *is the Director of Regulatory Affairs for the Offshore Marine Service Association (OMSA). As a licensed Chief Engineer and subject matter expert, he has consulted with numerous organizations focusing on developing awareness of marine operations at the individual level and within organizations. Chad is active in various industry volunteer efforts including the National Offshore Safety Advisory Committee and the Marine Technology Society Dynamic Positioning Committee. ontributor to our pages.*

How to Get to Hybridization

By Jon Mosterd

Mosterd

Hybridization in the marine world is transitioning from the latest fad to a key part of vessel design and retrofits. Driven in part by a demand for increased efficiency and new waves of global legislation, hybridizing or electrifying a vessel is quickly becoming necessary for organizations. In fact, the International Maritime Organization (IMO) rules and guidelines for the marine industry call for reduced emissions globally, and some ports around the world have established ambitious goals to reduce emissions to zero percent.

Early adopters of electrification and hybridization are already reaping the rewards and realizing positive returns on investment – including real savings and benefits to their fleets. Furthermore, they have also gained the knowledge and experience to continue to grow and develop even more hybrid solutions. Considering this, an increasing number of organizations are beginning to evaluate how they can move towards hybridization in their marine applications.

The hybridization challenge

Generally, hybridization can be defined as the coupling of two or more energy sources together to increase efficiency and maximize output. Often, these systems are coupled with energy storage via batteries or super capacitors to help smooth out peak power loads, or even provide peak energy for short-term loads. Further, many companies are replacing fuel-driven propulsion or thrusters with electric motors and using a series of generators to provide power based on demand. This, in turn, means that a vessel only consumes the necessary fuel, and alternate generators that are not required are turned off.

For some, hybridization can seem like an unavoidable risk. But, the first step to developing a successful plan for hybridization is to conduct the thorough research necessary to review your current situation. This will establish the vessel's needs and provide solutions for the future. Investing in the resources to gather the correct data and establish a baseline of where you are currently is an essential. The plan and data should then be verified through multiple recommendations, as there are varying opinions on solutions and approaches. Knowing where you have been and where you are at will help to set the right trajectory for the future.

The hybridization process can start with a few shaft generators and increase all the way to a fully electrified vessel. Fully understanding and considering the purpose of your vessel will be critical to laying this groundwork. Items such as electric propulsion and thrusters, energy storage, shaft

Credit: Danfoss

"By considering the different aspects of the efficiencies that can be achieved, hybridization can enable vessels to reap many benefits … Hybridization can enable the use of smaller generators where peak loads are handled by battery systems, allowing generators to run less frequently – thus resulting in reduced weight, space, and maintenance."

generators and multiple gensets are all puzzle pieces that vessel owners can move in and out of a vessel design. For some applications with short distances and duty cycles, fully electric ships have already been deployed and more are being designed and built for the future.

Benefits of hybridization

By considering the different aspects of the efficiencies that can be achieved, hybridization can enable vessels to reap many benefits. The primary return on investment in a hybrid vessel will be achieved through costs savings related to reduced fuel consumption. However, there are other tangible items to also consider. Hybridization can enable the use of smaller generators where peak loads are handled by battery systems, allowing generators to run less frequently – thus resulting in reduced weight, space, and maintenance.

For example, on a double propulsion system, shaft generators can be incorporated that can both motor or generate. In light duty, one of the two diesel generators could be shut off and powered by the other shaft generator instead. The engine that is running could power both the prop and a generator, while the engine that is off would be unclutched and have its generator switched to a motor. It would still function at a reduced load via the electric motor. This would translate to less operational hours on the two units, less maintenance, and more efficient fuel use.

Another advantage for hybrid vessel systems is performance. Whether using diesel or liquefied natural gas (LNG) engines, the response time to a power request is not immediate. Further, these engines do not adjust well to sudden changes in load. With power electronics coupled to energy storage, response times to a peak power need can shift from seconds to milliseconds. The engines also will not see this sudden change as it would be absorbed by the batteries or super capacitors, and there would be no need to have generators on standby to accommodate these peak loads. Thus, the equipment will experience less mechanical stress and load, which will extend its lifetime and decrease maintenance costs.

Utilizing smaller generators, shaft generators and power storage also allows for a higher level of redundancy on the vessel. Having multiple power sources and multiple electric motors can mean that vessels will still be able to operate at reduced loads in the event of a system failure. Take the two-propulsion shaft generator example above. If one propulsion motor has a fault, the shaft generator could be switched from a generator to a motor. Auxiliary generators, or the main propulsion generator, could then bring the vessel back to harbor for repairs via the electrical motor; all without a costly tug or tow.

Operating these multiple power sources will require the proper power management infrastructure. When these systems are designed correctly, they will be programmed to address the specific lifecycle of the equipment as well as help crews troubleshoot with ease. Many companies have invested a lot of resources into research and development to create control systems to help vessel operators run at peak performance and peak efficiency. However, it is still imperative that the integrators delivering the hybrid system have experience and tested power management software. The most cost-effective solution (up front) may not necessarily be the best or most cost-effective in the long run.

Weighing all the variables

There are a lot of benefits to hybridization; however, there are also some additional costs that need to be factored in. Batteries, super capacitors and power electronics require a different approach to maintenance. They also have different lifecycles and can require a specialized skill set to service. Getting crews trained will also need to be a vital part of the equation when considering the transition to hybridization. Troubleshooting a broken hydraulic line, for example, is a drastically different task than a broken wire. Also, there will need to be a different approach to stocking spare parts on the vessel as some will have special guidelines for maintenance. Therefore, when it comes to hybridization, having the right partners means more than just finding the right suppliers; it must also include partnering to have the right people on board.

In fact, these partnerships—and having a concrete goal and plan in mind—are key items for success in navigating the multiple approaches to hybridization. An in-depth approach must be taken and planned out carefully. Once establishing what your approach will be for a hybrid vessel, finding experienced partners who will walk alongside you in the journey is the next key step. Climbing the mountain is easier done when you have not only defined a strong vision, but also when you partner with others who have already experienced it.

***Jon Mosterd** is currently a member of the North American Center of Excellence at Danfoss Drives. Alongside his team, Jon helps to support Integrators, OEMs and end users with their marine and heavy industry applications.*

'Power' to the People

Interstate-McBee brings affordable aftermarket replacement parts to a marine sector thirsting for new ways to bolster the bottom line. As freight rates, subchapter M and the advent of EPA Tier IV requirements all impact the market, an affordable overhaul of an existing engine is one way to find real relief.

By Joseph Keefe

A recent report, entitled *"Impact of Updated Service Life Estimates on Harbor Craft and Switcher Locomotive Emission Forecasts and Cost-Effectiveness,"* found the average Category 2 workboat remains in service for 50 years, instead of the 23-year lifespan estimated by the EPA in the 2008 Heavy Duty Locomotive and Marine Rule. A longer service life reduces the fleet's turnover rate to cleaner, lower-emitting engines, but it also means something else: these engines are well built, long lasting, and perhaps just as importantly; virtually all of them are out of warranty.

As much as 41 percent – a whopping 17,596 vessels – of the domestic commercial fleet is now older than 21 years, some of it (13,353; 31%) 25 years or older. Moreover, 61% of all U.S. flag self-propelled vessels are older than 25 years. And, since the vast majority of these self-propelled vessels toil in workboat sectors, that means that a serious amount of work is necessary to keep them on the water. Central to that effort is engine maintenance.

Domestic workboat operators face many challenges in today's business climate. When it comes to propulsion, operators have choices: they can repower with an expensive new engine, they can spend even more money on a new vessel, or for those not in a position to pay for either of those pricey options, they can economically overhaul their existing engines. Many are choosing to do just that. For those that do, Interstate-McBee is there to help.

MEET INTERSTATE-MCBEE

Interstate Diesel Service, founded in 1947, originally specialized in remanufacturing Detroit Diesel fuel injectors. Since then, they've expanded several times and into many more markets. According to Pat Roach, Interstate-McBee's Vice President of Sales & Marketing, from the very beginning, the firm worked with many OEM's, including being the exclusive supplier to EMD. Since then, he says, "Through our OEM experience we have implemented tight quality controls earning us ISO & EPA certifications unmatched by any other replacement parts manufacturer. We offer the marine market a high quality alternative for engine parts with an opportunity to save money while maintaining high performance and reliability demanded by the marine industry."

With over 300 full time employees, the firm operates in multiple engine sectors, but Roach reports that the marine market has been growing the past 10 years and has become increasing import for Interstate-McBee. "This growth can be attributed to our focus on higher horsepower engines;

U.S. Vessels: a cornucopia of engine rehab possibilities …

TYPE / AGE	TOTALS	<= 5	6-10	11-15	16-20	21-25	>25
TOTALS	42,542	6,881	7,065	4,201	6,740	4,243	13,353
Self-Propelled	9,410	837	925	652	814	446	5,740
Dry Cargo	832	48	60	104	93	67	460
Tanker	79	21	22	14	7	3	12
Pushboat	3,382	421	353	169	196	106	2,137
Tugboat	2,462	128	243	139	185	84	1,683
Passenger	881	27	31	54	87	102	580
Offshore Supply	1,774	191	215	172	246	84	866

Source: USACE

especially Caterpillar and Cummins," explains Roach. Beyond this, a rapidly aging domestic fleet has thrifty owners, in particular those smaller 'mom and pop' operators, turning more often to engine overhaul as an economical way to extend the life of their tonnage. And, why not?

Although Interstate-McBee has supplied parts to a number of OEM's over the years, its primary focus has been aftermarket replacement parts. Roach explains, "Our target market is engines that are out of the OEM warranty period." But, that doesn't mean that Interstate-McBee isn't part of the solution when it comes to cleaning up the environmental footprint of workboats. They are.

Since the 1990's, Interstate Diesel designed, patented and marketed a variety of revolutionary fuel injection components. "ECOTIP" technology for EMD engine applications is an example of one of these components. This technology dramatically reduces exhaust particulates and significantly improves fuel economy for rail, marine, power and industrial applications.

"Certainly, the Ecotip technology can be a significant factor in improving the emissions level for an engine," explains Roach, adding quickly, "We have provided Ecotip injectors to various engine builders who have incorporated these injectors into their own emissions certified kits." And, while emissions involve more than just fuel injectors, the Ecotip is a key component in many current EPA emission certified engines operating in various markets. Beyond this, the Ecotip injector can also be used during

"Although price is one area in which we compete with the OEM, we excel on the service and support side. As a privately held business, we are both flexible and fast. Our prices are lower because we take one step out of the distribution chain meaning one less markup to the final user, but our same day ship service really puts us above most of our competition as today's customer needs and expects their parts now, not next week or even next month."

– Pat Roach, Interstate-McBee's Vice President of Sales & Marketing

regular maintenance as injectors need to be replaced every 2-3 years to maintain EPA compliance.

Moreover, Interstate-McBee manufactures its own brand of engine gaskets and gasket kits; myriad types for a wide range of engines. Roach explains, "We sell many of our parts in 'overhaul kits' which include engine parts and gaskets. The marine market is certainly more demanding than other markets and our reputation for quality and service has opened more and more hatches for us. This is why we see growth in our marine business."

Today, and for lower horsepower engines, Interstate-McBee is the only replacement parts company to manufacture both fuel injection and engine components used in marine service around the world. The firm reports customers

"Our target market is engines that are out of the OEM warranty period."
– Pat Roach, Interstate-McBee's Vice President of Sales & Marketing

in 90+ countries. Hence, a key part of the Interstate-McBee promise involves distribution centers on the U.S. East, West and Gulf Coasts. That infrastructure allows the firm to ship 95% of all orders on the same day. Roach adds, "We tie all the centers together with a single back end ERP system so parts in every location are available to everyone at any time."

In terms of marine applications, especially if it's a Caterpillar, Cummins, or Detroit Diesel engines, Interstate-McBee has over 20,000 part numbers in stock and over 75,000 part numbers available through their distribution points.

PROPULSION PROBLEMS? YOU HAVE OPTIONS ...

With all engines, there is a certain "useful life" which is often calculated in terms of machine hours. This could be anywhere from 18,000 to 30,000 hours depending on the application. At the end of this life cycle, an engine can be rebuilt for a fraction of the cost for a new engine, particularly a large diesel engine. For marine applications the engine will often last as long as the vessel or perhaps even longer. The need to replace the power plant often comes from emissions regulations and/or the availability of government funding (DERA or WV funds) to cover a large portion of the replacement costs.

According to Roach, customers with older engines tend to be more open to replacement parts rather than just 'OEM Only.' But, he says, those same customers still want performance and efficiency so the quality of their overhaul parts and their service parts are just as important to them as they are to owners of newer engines. As this domestic fleet sector ages, that's not like to change any time soon.

"We still receive calls from customers looking for parts to service engines that were built during WWII," says Roach. "There is no doubt that a properly maintained engine can last literally a lifetime or longer. Certainly parts wear out and sometimes catastrophic failures happen which prevent an engine from being rebuilt, but in the marine market in particular replacing with new can be very costly which is why maintenance is so important. Marine operators tend to be diligent about maintenance as a breakdown at sea can have perilous consequences. That is why you see engines in the marine industry lasting for a very long time."

Simply stated, the Interstate-McBee business model involves the manufacture of myriad replacement parts for diesel engines, selling direct to service personnel whose engines are likely out of warranty – for far less than the OEM's do it themselves. That said, Roach insists, price is only one part of the equation.

"Although price is one area in which we compete with the OEM, we excel on the service and support side. As a privately held business, we are both flexible and fast. Our prices are lower because we take one step out of the distribution chain meaning one less markup to the final user, but our same day ship service really puts us above most of our competition as today's customer needs and expects their parts now, not next week or even next month."

ALWAYS LOOKING TO THE FUTURE

In 2008, with the rapid expansion of the business, McBee Supply moved into an independent dedicated distribution facility in Cleveland. With more space at the manufacturing facility Interstate-McBee created two engine test cells to validate new products prior to launch. These test cells allow testing of engines up to 2,000HP. That's important because as engines have evolved, the specifications for individual components within engines have become much more stringent. The equipment needed to manufacture is very different from the equipment used for older components. And, says Roach, Interstate-McBee responded to the challenge by investing more heavily in the business.

"Starting in early 2018 and with a nudge of the bonus depreciation in the federal tax code, we committed to bringing in new, state-of-the-art equipment that is not only more capable, but more productive. We launched a new business within the business that will be fully capable of producing the latest common rail fuel injection. In addition to the new equipment, we are in the process of redesigning our factory for efficiency and environmental control such as humidity and temperature control, cleanliness and positive air pressure."

Servicing the complicated aftermarket engine market is no easy task. Hence, Interstate-McBee is constantly expanding its legacy product offering along with new engine lines. Roach reports that another addition will be announced later this year; something directly related to his marine market sector work. 72 years old and counting, Interstate-McBee continues to invest into personnel and equipment.

Pat Roach – bullish on what will come next – sums it up simply by saying, "We are positioned for decades to come." That's good news for domestic workboat operators who want to claim the very same thing. www.interstate-mcbee.com

Ballast Water Update: Weighing the Advent of VIDA

The hard-fought passage of VIDA promises a simpler, more unified and logical set of environmental standards related to the discharge of myriad vessel streams. Industry wanted it, and now it is here. Will it deliver, and if so, when? That depends on who you talk to.

By Tom Ewing

As most commercial maritime operators know, US ballast water regulations made a sharp turn last December. That's when President Trump signed the Frank LoBiondo Coast Guard Authorization Act of 2018.

That legislation contained Title IX – the *"Vessel Incidental Discharge Act (VIDA),"* a welcome legislative goal among many maritime business trade groups who had long complained that US ballast water regs were such a confusing mix of directions and requirements that compliance was almost impossible. Until now, ballast water and with it, the issue of invasive species, has been controlled on numerous regulatory fronts: through EPA's vessel general permits (VGP) and the Nonindigenous Aquatic Nuisance Prevention and Control Act and the National Invasive Species Act as well as other U.S. Coast Guard and clean water legislation provisions. Beyond this, almost twenty states further 'Balkanized' the critical issue by forming individual local statutes, each different in their own, obscure way.

Congress, with VIDA, ripped out this regulatory tangle. By 2022, at the latest, the VGP will be gone, as will aquatic nuisance and invasive species legislation (at least as it pertains to vessel discharges). Instead of a permit, discharges will be controlled via regulations. [**Note:** until this new work is finished all existing permits and regulations remain in place and in force.]

Examining VIDA

To get there, VIDA first requires EPA to develop new "Federal standards of performance for marine pollution control devices for each type of discharge incidental to the normal operation of a vessel." Discharges, of course, can include anything from bilge water to firemain systems to boat engine wet exhaust to ballast water. VIDA discharge standards are due by December 2020. What can you expect? Currently, the VGP addresses 27 vessel discharges. An EPA spokesperson, in an email, said that "EPA anticipates that the majority of the discharges for which VIDA standards will be developed will remain the same."

Then, VIDA requires the Coast Guard to take EPA's new discharge standards and develop "regulations governing the design, construction, testing, approval, installation, and use of marine pollution control devices as are necessary to ensure compliance with EPA's standards." Deadline: December 2022.

Generally, VIDA does not apply to recreational vessels or small vessels (less than 79 feet in length) or fishing vessels. However, small vessels and fishing vessels are NOT excepted if they discharge ballast water!

Readers will likely note that there are a number of issues going on here all at the same time. Critically, VIDA is not just about ballast water – it's about all of the discharges

It isn't getting any easier: *The 27 discharges outlined in the 2013 Vessel General Permit:*

Bilgewater/Oily Water Separator Effluent	Sonar Dome Discharge	Deck Washdown and Runoff
Anti-fouling Hull Coats/Coating Leachate	Welldeck Discharges	Aqueous Film Forming Foam (AFFF)
Oil Sea Interfaces (props, tubes, etc.)	Fish Hold Effluent	Boiler/Economizer Blowdown
Motor Gasoline, Compensating Discharge	Elevator Pit Effluent	Equipment Subject to Immersion
Refrigeration & Air Condensate Discharge	Firemain Systems	Gas Turbine Washwater
Distillation and Reverse Osmosis Brine	Freshwater Layup	Non-Oily Machinery Wastewater
Graywater Mixed with Sewage from Vessels	Cathodic Protection	Seawater Piping Biofouling Prevention
Exhaust Gas Scrubber Washwater Discharge	Chain Locker Effluent	Boat Engine Wet Exhaust
Seawater Cooling Overboard Discharge	Ballast Water	Underwater Ship Husbandry

covered by the VGP, and maybe more (although much of this report is focused on ballast water). And, while the typical workboat in U.S. waters isn't impacted by ballast water regulations, that's also not always the case.

Additionally, concurrent to VIDA's Congressional development, the Coast Guard has been working frantically to certify ballast water management systems – the equipment and processes that vessel operators can invest in with the confidence that those systems will comply with current ballast water standards.

Importantly, whatever new discharge standards EPA and the Coast Guard eventually establish, those standards cannot be less stringent than current requirements for effluent limits and requirements for various types or classes of vessels.

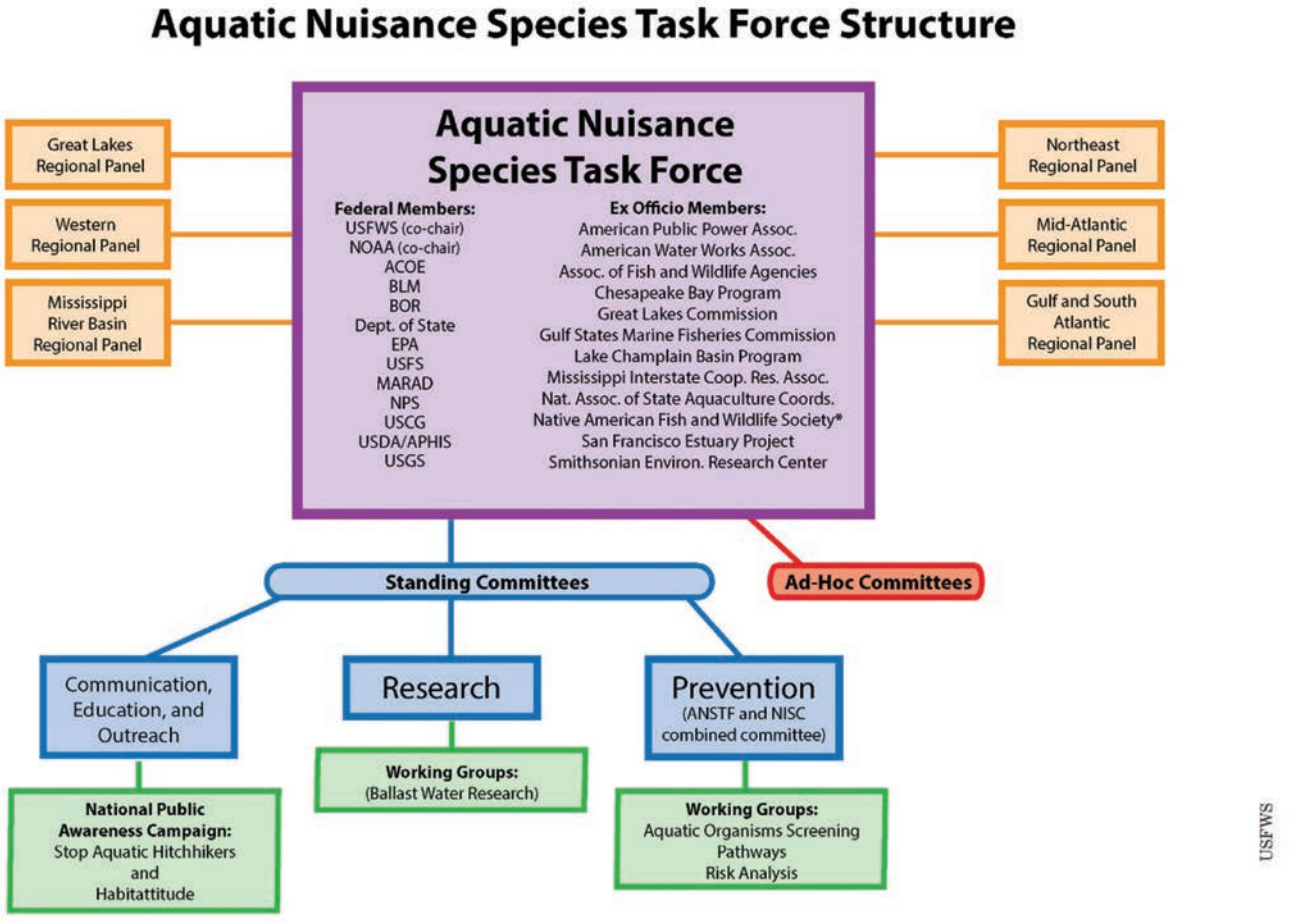
Congress' goal with VIDA is the development of national uniform vessel discharge standards, a system to replace today's fragmented system that places varying demands literally from state to state. VIDA's implementation is a marriage of existing vessel discharge policies with the Act's new demands. VIDA's starting line is within an already swirling set of issues. As noted, EPA and the Coast Guard have less than four years to make very choppy waters into a serene, placid and predictable stream. That won't be easy.

VIDA is not just about ballast water, but ballast water does receive singular, focused attention within VIDA. The Act requires, for example, a captain to conduct a ballast water exchange or saltwater flush prior to calling on certain US ports. It requires proper maintenance and performance standards for ballast water management systems (BWMS) and requires a "valid type-approval certificate" for that system, similar to current requirements.

Notably – and of great importance to individual U.S. states – VIDA allows state and regional interests to participate in standards development, although the Act keeps final decisions within EPA and the Coast Guard. Another important concept: VIDA seeks to "preserve the flexibility of States" regarding program administration and enforcement.

Outreach & Engagement

One initial, general focus for both the EPA and the U.S. Coast Guard, in the first six months, has been stakeholder outreach and engagement. The agencies have developed two interactive webinars presenting an overview of VIDA, providing a chance for people to ask questions and com-



ment on future program development.

Captain Sean T. Brady is the Chief of the Coast Guard's Office of Operating and Environmental Standards (OES). Brady's office is responsible for developing the maritime regulatory standards required by international treaties and U.S. statutes, regulations, and policy. In an interview, Brady said that his office and EPA have been working together since December, discussing and planning how to best move forward. He said that each Agency has a "VIDA team." These teams meet weekly, usually via teleconference.

Brady noted that EPA and Coast Guard regulations can be similar, but different enough to make compliance difficult. "Regulatory consistency," Brady said, "reduces risk for the commercial industry. We feel that it's just as important to develop a consistent program as it is to develop an effective standard."

These initial, general planning efforts are important. VIDA requires cooperative work with state governors as well as formally established advisory bodies, such as the Great Lakes Commission and the Aquatic Nuisance Species Task Force. But VIDA also makes specific demands as implementation starts.

One important initial work product is publication, by the Coast Guard, of a draft "policy letter" describing "type-approval testing methods and protocols for ballast water management systems." This draft will address nonviability of organisms in ballast water as well as system performance and laboratory certification.

This is critical work. The draft letter was due 180 days after VIDA's enactment – around June 4. The document is late: still unavailable by mid-June. Stakeholders should watch for its release because that starts a 60-day public comment period. Issues needing evaluation include how the draft aligns (or not) with IMO (International Maritime Organization) requirements. Other issues could reference UV efficacy and verification, and use, of "most probable number" analyses referencing phytoplankton and other biota.

The letter will include EPA's test protocols and new standards. For ballast water, it will serve as the basis for a final policy regarding "type-approved" treatment systems, which needs to be in place one year after VIDA's enactment, or December 2019. Brady adds, "Systems already type-approved by the Coast Guard will retain their approval. We do not expect to address the status of or include a discussion on existing systems in the policy letter."

Although there is no date for its start-up, another important VIDA requirement is establishment of an "Intergovernmental Response Framework" to respond to nuisance species risks from ballast water and vessel discharges. This

"Ballast water is a policy that has in many ways eluded the Basin for decades and one that is worth getting right. The Commission strongly urges the US and Canada to find a way to work together with the Great Lakes Basin community to develop smart, durable and consensus-based policy solutions for vessel discharges."

– Darren Nichols, Executive Director - Great Lakes Commission

will include tracking invasive species, evaluating specific risks and establishing emergency best management practices for rapid deployment in a specific locality or region. This is to be coordinated through the federal Aquatic Nuisance Species Task Force (ANSTF) which includes representatives from numerous federal agencies, as well as ex-officio members, from the American Water Works Association, for example, and the Great Lakes Commission. Six regional panels advise the larger Task Force.

Brady said a focus on this Framework is starting now but he added that these next steps depend somewhat on the proposals within the forthcoming draft policy letter. Importantly, this response Framework is linked to new ballast water reporting requirements to be filed with the National Ballast Information Clearing House. The reports will serve as the basis for an annual report evaluating "nationwide status and trends" relating to ballast water delivery and management and "invasions of aquatic nuisance species resulting from ballast water."

That first annual report, authored by the coast Guard in conjunction with the Task Force and the Smithsonian Environmental Research Center (SERC), is due July 1, 2019. It's not clear whether that first report will be ready on time. SERC officials did not reply to questions about their work.

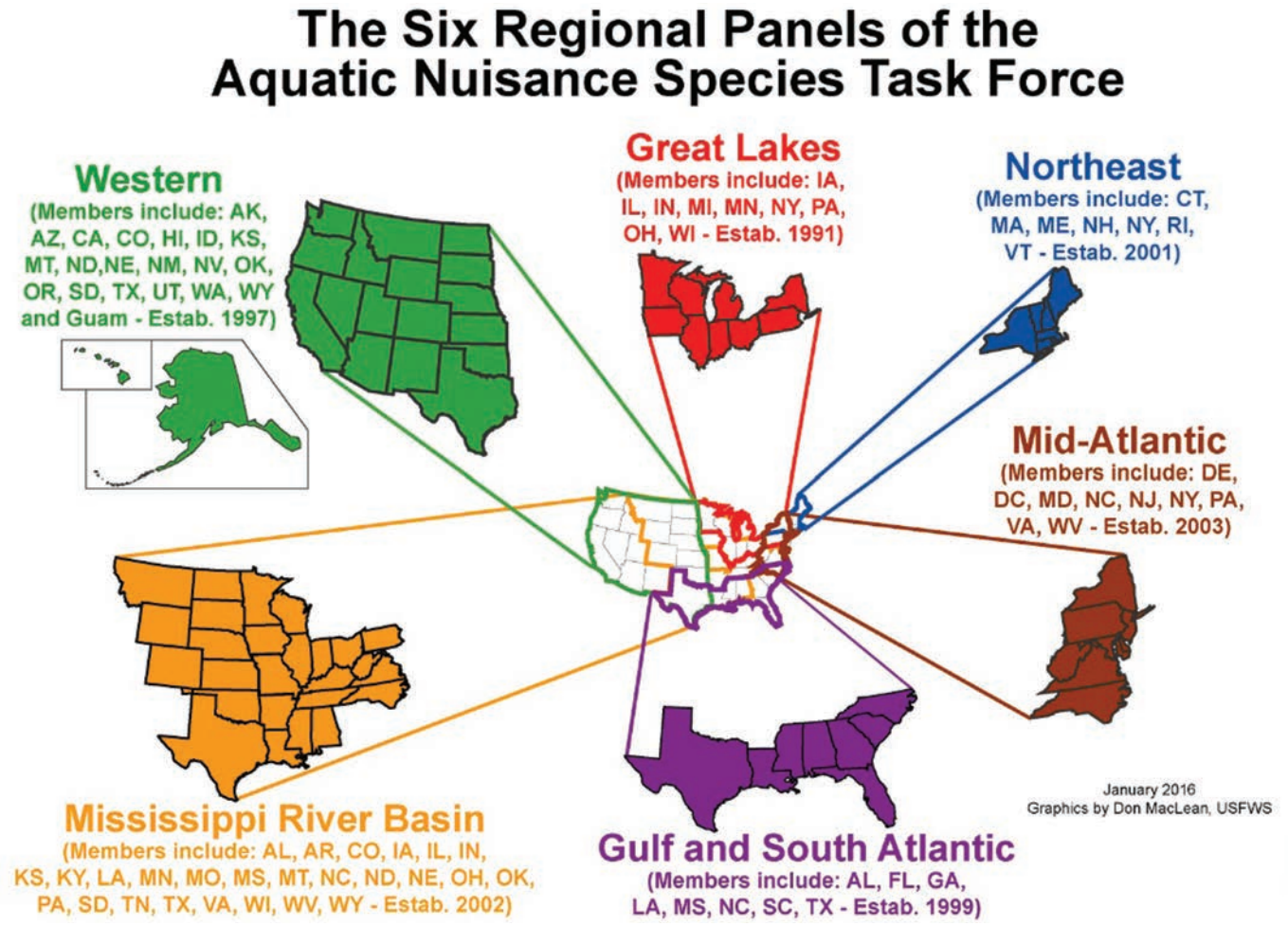
The Great Lakes

As one might expect, the Great Lakes Commission (GLC), based in Ann Arbor, MI, is one major regional group keeping a close watch on initial VIDA/ballast water implementation. With invasive species, particularly for the Great Lakes, there's usually no second chance – clean up and remediation are poor substitutes compared to preventative diligence. GLC, established in 1955, includes the eight Great Lakes states; Ontario and Quebec are associate members.

VIDA does provide a mechanism for Great Lakes governors to propose and implement "enhanced standards and requirements." But it's not a quick and direct process and the costs associated with a new standard have to be considered. For higher compliance costs, each Great Lakes governor has to endorse the proposed standard. If compliance costs do not increase, just five of the eight governors need to endorse. Depending on point of view this can seem too slow and clumsy. On the other hand, it prevents governors, perhaps facing internal state pressures, from casually taking on a process with very complex science.

Darren Nichols is Executive Director of the Great Lakes Commission. As VIDA moves forward, Nichols said that GLC is evaluating how it can best influence upcoming ballast water policy decisions. A top priority is a "constructive binational dialogue." Canada's ballast water regulations align with the IMO, not the U.S. Coast Guard. Nichols wrote in an email reply to questions that it's unclear to the Commission "whether and how the two federal governments are working together toward a harmonized outcome in the Great Lakes." One idea GLC is considering is a conference with EPA and the Coast Guard to "explore where there may be areas of consensus among key stakeholders" before "proposing a formal national standard."

It is GLC's contention that dual federal rulemaking is unlikely to provide a comprehensive solution to ballast water within the Great Lakes basin. The GLC Board of Directors seeks a "harmonized, binational approach since the waters of the Great Lakes are not limited by political



boundaries." Regarding process, GLC thinks that solving ballast water issues will require a "more nuanced dialogue" than exists within standard public comment processes, e.g., the 60-day window that will follow the draft policy letter.

Nichols writes, "Ballast water is a policy that has in many ways eluded the Basin for decades and one that is worth getting right. The Commission strongly urges the US and Canada to find a way to work together with the Great Lakes Basin community to develop smart, durable and consensus-based policy solutions for vessel discharges."

A Good Start?

On the industry side, the American Waterways Operators (AWO) has long been involved in ballast water policy. AWO led the industry coalition supporting VIDA's passage, citing the benefits of a uniform, national program. Jennifer Carpenter is AWO's Executive Vice President & Chief Operating Officer. It's her assessment that EPA and the Coast Guard are off to a good start with VIDA implementation. "We're very encouraged by what we've seen," Carpenter said, citing "excellent cooperation and communication" between the two agencies. As an example, she cited the recent EPA/Coast Guard VIDA listening session at the US Merchant Marine Academy.

Carpenter said that VIDA implementation offers the Coast Guard and EPA a chance to prioritize management practices that can provide better payoffs for environmental protection and vessel operators' time and resources. She noted, for example, that with barges, the VGP requires a weekly vessel inspection that must be documented every week and reported to EPA annually. If a company owns 100 barges, that generates over 5000 reports per year, a filing deluge not likely helpful to anyone. She hopes that VIDA implementation results in a program focused on pollution prevention, establishing big-picture indicators of progress and success, based on streamlined and efficient compliance requirements from marine businesses.

That's a great set of goals. The clock is ticking.

***Tom Ewing** is a freelance writer specializing in energy and environmental issues.*

MARITIME SIMULATION AND TRAINING: A PARTNERSHIP THAT PAYS OFF

It is truly no accident that Delgado Maritime & Industrial Training Center and Florida Marine Transport collaborate so closely.

By Lisa Overing

Zero incidents, zero injuries and eliminating critical barge and equipment failures doesn't just happen by osmosis. It's a result of continual safety training that breeds operational awareness and confidence to anticipate a difficult situation on an inland waterway before it actually occurs.

With a high school education, Capt. Shelden Detrafford started out making $25/day in the 1960s. His training was provided by an experienced captain who took him under his wing and showed him the ropes, literally. Today, Detrafford is paying it forward – this time, on land via simulator training.

"Many pilots now make $1,000/day," said Detrafford, who adds quickly, "For a young man starting out, if you can pass the qualifications, you can make a very good living."

Fifty years later, Detrafford still looks forward to work each day. He shares decades of wisdom with younger captains on the Transas Navi-Trainer Professional 5000 simulator for Florida Marine Transport (FMT) at Delgado College's Maritime, Fire and Industrial Training facility in New Orleans, LA. With his partner, Capt. Jerry Wiltz, Detrafford customizes training for FMT at Delgado's brown water academy.

SOLID FOUNDATIONS WITH HIGH TECH SUPPORT

With three interactive suites and another instructor in a fourth room demonstrating the law of superior tonnage on a rogue ship with the right of way, the simulator is a virtually complete, land-based training experience for every career level on a towboat. A captain can climb the hawsepipe with the confidence and expertise required to operate and navigate safely after simulator training, handling a bigger tow for bigger pay.

"Students think about all safety points, how to keep your cool in critical situation," said Rick Schwab, senior director of maritime and industrial training for Delgado's $7 million state-of-the-art center. "You'd rather crash in here than crash out there. The simulator shows how fast things can escalate in a domino effect."

Students learn hands-on training in the simulator driving an inland towboat with an identical bridge setup, including all electronics and chart plotting systems. The control panels are interchangeable with an exact replica

of wheelhouse, radio, radar, and engine room monitoring with two sets of rudder controls. Three bridge simulators interact with three students at a time. Bottom line?: critical emergency scenarios can be realistically simulated – without breaking the towboat.

FMT brings everyone to simulator training annually, all pilots, captains and mates, excluding deckhands. An ambitious deckhand could move through the ranks to the wheelhouse in less than 10 years. "You enter the simulator in the steerman program," said Bobbie Sikes, FMT's training center manager. "It all depends on how fast the individual wants to advance. You need four or five years on deck before entering the steerman program. It depends on how hard you hustle."

Capt. James "Greg" Duncan assumed command of M/V Brian O'Daniels about four years ago with Florida Marine. The vessel is a 90-foot long by 32-foot wide tow boat, 2400 HP.

"The simulator is more a refresher tool to use rules of the road while underway," said Duncan, who normally pushes two chemical barges. "It gives you a chance without learning the hard way if you're not ready for it. I can't rave enough about Capt. Shelden and Capt. Jerry. Just racking their brains was beneficial. They make it enjoyable to go to class on your time off."

LESSONS LEARNED: EXPERIENCE CONVEYED

Training and experience taught Duncan to be in position in the right place at the right time with a big, heavy tow. "That is half the battle – knowing ahead of time if you're in a bad spot," said Duncan. "You might not want to be there next time. If you try to work against Mother Nature, you are fighting a losing battle, working against the wind and the current."

Duncan trained in critical areas on the simulator, near Morgan City, LA, for instance, that are tricky when the water is running hard.

"The locks near Corpus Christi and Dauphin Island bridge near Mobile, we trained on those areas," said Duncan. "It became progressively more difficult. There's nothing like the real thing, but the simulator is close. You have to use your brain, think on your feet. I can run nearly anywhere except the upper Ohio River or Illinois River because I never got the experience yet. However, I've run the Mississippi River up to St. Louis, Tenn Tom and the Achafalaya."

Duncan started with FMT as a green deckhand, moving through the ranks to tankerman to steerman and everything in-between with education on the simulator. He feels FMT instills safety in their wheelmen, providing awards if there are no recordable incidents.

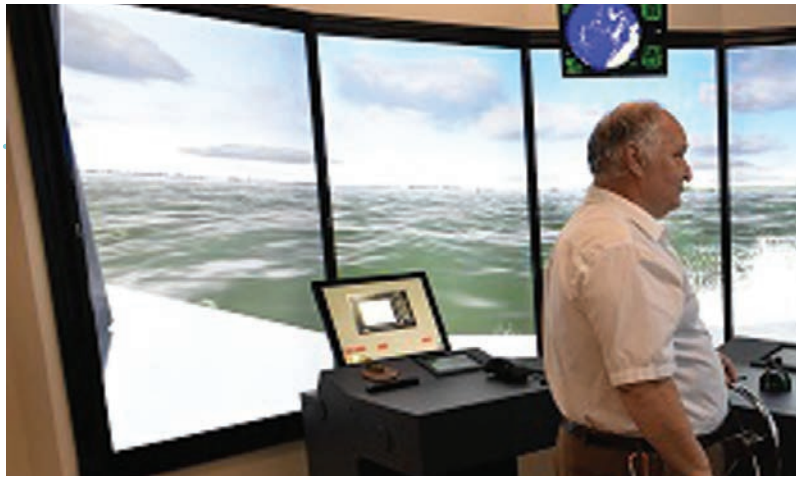
"People tend to get on board a vessel with enough knowledge to get by, we freshen them up to prepare for situations they couldn't get out of," said Detrafford. "I don't care how old you are, you learn something new every day. It is not a pass/fail deal; it is more 'show me what you can do.'"

The simulator actually gives the sense of a vessel moving on the water and how it feels, rocking in open water, and even running aground if there's insufficient water beneath your vessel. While simulating emergency procedures like loss of power, steering or a break away tow, nothing breeds confidence and experience like the simulator, where one is allowed to sharpen their skills.

"This is the most impressive simulator around with a premiere system for inland waterways," said Detrafford, who marvels at the realistic graphics. "People don't realize what goes into crossing rivers and canals, we are a stepchild in towboats."

"We have a true partnership with FMT," said Schwab, who added, "We (Delgado) used an FMT facility after Katrina to continue to train FMT and other maritime companies while rebuilding our site that was destroyed. We customize training for FMT with Subchapter M. We work with the USCG to make sure they meet or exceed safety required for training. Everything we do now has an assessment. It is not about dulling the sword, but about sharpening the sword and building new levels of confidence to strengthen the student's abilities."

– Rick Schwab, Senior Director of maritime and industrial training for Delgado's state-of-the-art center



DELGADO: CUTTING EDGE EQUIPMENT EQUALS INLAND EXCELLENCE

With a dynamic positioning simulator planned for summer, Delgado's simulators adapt for both conventional and Z-drive propulsion. Situations can be tailored for unique circumstances; from running a light boat in the Intra-Coastal Canal to pushing 30 loaded barges southbound in the Mississippi River with a 6000HP towboat. Inland and offshore wheelhouse simulation is also offered at Delgado.

"We now video the simulation to pull and review as we make our full report," said Detrafford. "We customize the program. Delgado operates the simulator and FMT does all classroom instruction."

Detrafford said ships are easy, but a towboat is different dealing with current. It's as large as a ship, but not the same propulsion and handling of a ship, especially in bad weather.

"Once in steerman program, we roll them through the simulator to see how advanced they are," said Detrafford. "We provide a full report with evaluation on everyone in the simulator training to decide if this guy is someone we want to promote – or should we leave him where he is for now?"

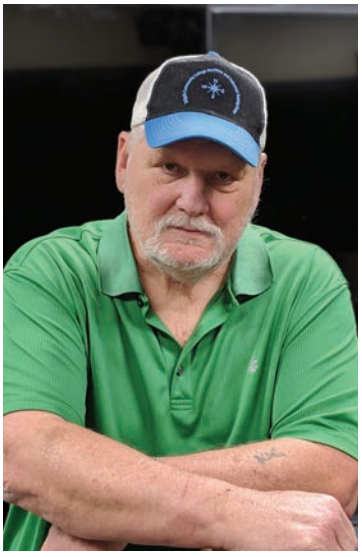
The simulator provides students with the opportunity to learn how to flank bridges, letting the current bring a large tow around the bend.

"You don't steer, you let the current do that for a 35-40 barge tow. You have to flank it, especially with low water. You can steer a small tow anytime, but with a large tow, you can't." For that reason, and others, Detrafford doesn't recommend putting anyone in the wheelhouse right away.

UNIQUE PARTNERSHIP YIELDS COUNTLESS DIVIDENDS

Originally a MARAD facility training marine workers in firefighting, Delgado expanded its training to include STCW, a full radar suite, and advanced inland waterway.

"We have a true partnership with FMT," said Schwab, who added, "We (Delgado) used an FMT facility after Katrina to



"We now video the simulation to pull and review as we make our full report. We customize the program. Delgado operates the simulator and FMT does all classroom instruction. Once in the steerman program, we roll them through the simulator to see how advanced they are. We provide a full report with evaluation on everyone in the simulator training to decide if this guy is someone we want to promote – or should we leave him where he is for now?"

– Capt. Shelden Detrafford

continue to train FMT and other maritime companies while rebuilding our site that was destroyed. We customize training for FMT with Subchapter M. We work with the USCG to make sure they meet or exceed safety required for training. Everything we do now has an assessment. It is not about dulling the sword, but about sharpening the sword and building new levels of confidence to strengthen the student's abilities."

While three students interact in separate simulation suites, three other students drill in the classroom, testing on rules of the road and policies and procedures. During his career, Detrafford rode with captains and pilots who could not read or write, but his mentors were shallow draft professionals with tremendous responsibility, operationally aware at every moment.

"What's going on around me?" said Detrafford. "Why is that guy doing that? We will not put you in a situation you can't get out of with the right moves. A captain has a $6 million vessel and makes 50 decisions simultaneously, by himself. Barges are worth about $1 million each and with 50 barrels of gas; that has a value, too. The old saying, speed kills, is true. How many Wall Street bankers make 50 decisions instantly without consulting anyone else on $6 million? Probably none. But a towboat captain has to do that, instantly, on his own."

For Captain Duncan, training keeps his skills sharp and emphasizes the best ways to avoid hazardous situations on the water. "It is a blessing to be part of FMT and I wouldn't have it any other way," said Duncan. Similarly, FMT and Delgado probably wouldn't change a thing, either. Collaborating today to prevent tomorrow's accidents: a worthy goal, yielding measurable improvements.

Lisa Overing *is an award-winning marine journalist and copywriter. Lisa served on the board of directors of Boating Writers Int'l from 2007 - 2012. She is published in nine languages for some the world's leading yachting titles. Additionally, she is creative director for Megayacht Media, an advertising agency for marine businesses. Email: lisa.overing@maritimemail.com*

All Aboard with Fire Safety

The latest technology can detect the risk of an on board electrical fire – before it ignites. It's not too late to incorporate this feature into your next workboat design.

By John Newbury

Fire on board always poses a risk to life, although certain vessels such as passenger ships present a particular danger because they carry a large number of people, and tens of millions around the world use them as a method of transport annually. However, a fire on any type of vessel, including the vast number and array of workboats, is always serious and can have far reaching consequences.

Historically, it has been difficult to prevent ship fires and minimize their impact because of the specific nature of marine vessels. For example, constant vibration and movement, especially on workboats, tends to chafe and loosen electrical wires, while confined spaces and limited evacuation routes all exacerbate the difficulty in identifying and then tackling an on board blaze. A risk assessment report on ship fires produced by the Finnish Border Guard and Finnish Transport Safety Agency and for use in the Baltic Sea Maritime Incident Response Group (Baltic Sea MIRG) project concluded that it is very difficult to prevent ship fires and minimizing their consequences has always posed great challenges.

Despite strict regulations in place to ensure vessels comply with fire safety requirements such as those in The International Convention for the Safety of Life at Sea (SOLAS) Chapter II, the FSS Code, and Section A of the STCW Code – International regulations that aim to both prevent ship fires and minimize their consequences (proactive measures) – there are still a worrying number of fires on board each year.

Given the size and scale of the problem, a growing number of maritime operators are looking for ways of prevention using latest technological advancements in fire safety systems.

Causes of fire on board

One of the most common causes of fire on-board are those resulting from electrical faults due to loose connections, faulty appliances or overloaded sockets and distribution-boards. They all have one thing in common – the generation of excessive heat, resulting in the ignition of adjacent combustible materials and, ultimately, fire. This abnormal heating of connections and components can develop long before a fire even starts, and is the root cause of so many avoidable and potentially life threatening electrical fires on-board vessels.

If there was a way of detecting this build-up of heat before the point of ignition then many electrical fires could be avoided. This was the thinking behind the development

(*) all images courtesy Ramtech

of our WES Hotspot, a new technology that monitors electrical installations and equipment, alerting nominated personnel on-board to the risk of an electrical fire long before it starts. The technology has the ability to turn what would be an emergency situation into a simple maintenance task. The units can be easily fitted to new or existing vessels, where they are incorporated within sockets, consumer units and distribution-boards – the key risk areas in a typical electrical installation, especially those on-board where constant vibration and movement can chafe wiring and loosen connections. In these situations, the technology provides permanent monitoring of heat and activates as soon as abnormal temperatures (80ºC ± 5°C) are detected. Once activated, the Single and Multi-Point Sensors generate a signal which can be connected to virtually any alarm system to provide those on board with instant notification.

A maintenance team can then be dispatched to the source of the alarm and carry out the necessary remedial work – long before it develops into a fire or trips out power supply. Prior to this kind of technology becoming available, the likelihood would be that the resistive heat would continue increasing well above 80°C until it resulted in combustion of nearby materials, or eventual tripping of the system after the fire had started. Once a fire begins, depending on its source, it has the potential to cut off both main and emergency electrical power supply, leaving the vessel adrift.

A step change from RCD's

A report by DTI (Department of Trade & Industry) in the UK estimates that only 20% of all electrical fires can be prevented by the presence of a residual current device (RCD), which would still allow the vast majority (80%) of electrical fires on board workboats to occur. The source of ignition in electrical fires within low voltage installations is resistive heat. Circuit Breakers, RCD's and RCBO's (residual-current circuit breaker with overcurrent protection or, in the United States, a GFCI breaker) are unable to detect heat generated at points of connection and therefore fail to respond to this major cause of fire until ignition has occurred.

RCDs are designed principally to avoid a person from being electrocuted and cannot detect the elevated temperatures generated by resistive heating. In order for an RCD to operate and isolate the supply (via a current imbalance) ignition would have already occurred.

Resistive heating of connections can generate heat in excess of 1000°C, well above the ignition point of many adjacent combustibles such as PVC cable insulation and switchgear components.

Summary

There is no doubt that there is a need for a pre-ignition safety device on-board that stops electrical fires before they start. Advances such as this provide an effective, easy to fit solution that actively prevents electrical fires – making it highly valued by workboat owners and operators. Being able to detect a fire before it starts means that it is more intuitive than existing protective devices such as MCBs and RCDs because it responds to the excessive heat caused by wiring faults and overloads.

Miniaturization of the technology, and an extended life from battery-powered devices, allow these devices to be fitted in a vast range of on-board consumer units, distribution-boards, sockets and electrical equipment, protecting the vessel and people from some of the hundreds of electrical fires that occur each year.

All of that said; it is clear that although RCDs and over-current devices do have an important role to play in mitigating the risk of an electrical fire, they are not able to address the majority (80%) of fault scenarios that may subsequently initiate fire ignition. Until now, there had not been a practical or straightforward way of detecting overheating of connections, yet these are a major cause of electrical fires. Latest smart technology is now capable of addressing the anomaly of electrical fires, meaning that routine installation of these relatively inexpensive devices could lead to a step change in on board fire safety.

John Newbury, *Product Manager at Ramtech Electronics Limited, has a background in electronics and wireless technology. He has been active in the design, patenting and development of a range of safety technology for the UK, European and North American markets. John is part of the senior team at Ramtech Electronics and is based at the company's UK offices in Nottingham.*

Stronger Together

NOIA, OMSA Partner to Advance U.S. Vessel Opportunities in the Emerging Offshore Wind Sector.

By Timothy Charters and Aaron Smith


Smith


Charters

In 1941, geologist Orval Lester Brace stated "it may be tentatively assumed that the Gulf of Mexico is a potential source of salt-dome oil. Whether or not it will be economically feasible to explore these waters for the domes that must exist is a question for the future to answer."

The future hypothesized by Mr. Brace was not nearly as far off as it seemed. Less than six years after his proclamation, Kerr-McGee Oil Industries, along with Phillips Petroleum, Stanolind Oil and Gas Co, and Brown and Root, had constructed the first truly offshore drilling and production platform 10 miles off the coast of Morgan City, Louisiana. By 1949, 44 wells had been drilled into the Gulf of Mexico.

The founding of this industry was anything but simple. The routine supply chain issues associated with land-based drilling became logistical challenges for the offshore explorations of the 1940s and 1950s. Pilings, derricks, pipes, and drilling components had to be loaded on surplus World War II vessels, wooden shrimp boats, and other small craft. As did every ounce of drilling mud, water, and cement used during drilling operations, not to mention the men that worked on these platforms.

To meet these challenges, Alden "Doc" Laborde in 1955 constructed the first vessel purposely built to address these needs. This vessel, the Ebb Tide, was constructed by Laborde and his partners for $225,000. This vessel was larger and more powerful than the vessels that had been previously utilized. It was also better designed for the tasks with a large open deck which could carry oversized equipment. Because of these assets, three sister vessels were almost immediately built, as was the company Tidewater, one of the largest vessel operators on the planet.

The offshore drilling and vessel expertise that was developed in the Gulf of Mexico in the 1940s and 1950s was quickly exported around the planet. When the North Sea opened for offshore energy production in 1966, the first work was conducted by many of the men, machines, and companies that had cut their teeth in the Gulf of Mexico.

This innovative and pioneering spirit continues in the U.S. offshore oil and gas industry today. Many of the vessel-based, drilling, production, and servicing innovations made in our global industry come from the Gulf of Mexico. This success has caused our industry to remain primarily focused on oil and gas development, instead of applying our innovative nature to other offshore industries.

As a result, most of the advances made in offshore wind technology have been made abroad in Europe.

However, the U.S. is catching up. In 2016, the first U.S. offshore wind farm was constructed providing 30 megawatts (MW) of power to the U.S., enough to power 22,500 homes. Unlike Mr. Brace wondering what tomorrow will bring for offshore energy, our organizations know these 30 MW of wind power will be paltry by tomorrow's standards.

The University of Delaware's Special Initiative on Offshore Wind (SIOW) recently released a white paper estimating that the anticipated development of 18,600 MW of offshore wind power in seven Eastern states by 2030. Supplying this power to our nation will be 1,700 turbines, towers, and bases; 60 substations; almost 5,000 miles of cables; and more than $5 billion in maritime support, insurance, and project management. All told between now and 2030, the U.S. offshore wind industry will invest $70 billion in capital expenditures.

This emerging market has gotten the attention and interest of the U.S. offshore energy industries and many Gulf of Mexico companies are now committing resources and exploring offshore wind investments.

While our industries have an innovative history and nature, understanding a completely new industry is not always the easiest of tasks. The offshore wind market, development timelines, and regulatory seascape are all different.

This is where our organizations come in.

The National Ocean Industries Association (NOIA) was founded in 1972 and represents all facets of the domestic offshore energy and related industries. NOIA's mission is to secure reliable access and a fair regulatory and economic environment

Credit: AdobeStock_Ian Dyball

for the companies that develop the nation's valuable offshore energy resources in an environmentally responsible manner.

Similarly, the Offshore Marine Service Association (OMSA) is charged with proactively fostering, and promoting ideas that advance the common good and the interests of the U.S. offshore service vessel market and associated maritime industries.

Considering these complementary missions, it simply makes sense for NOIA and OMSA to come together to assist our members and our broader industry in understanding the emerging U.S. offshore wind market and the possibilities held within this market.

That is exactly what we are doing. On September 19, our organizations will host the NOIA-OMSA Offshore Wind Summit in New Orleans, Louisiana. This half-day event will feature three panels of industry experts.

In the first panel, Dr. Stephanie McClellan, the Co-Director of the SIOW will provide details on how the U.S. offshore wind market will be structured. Dr. McClellan wrote the above-referenced report which found that $70 billion in capital expenditures will be seen in this market between now and 2030 and she will use her presentation at the Offshore Wind Summit to discuss this report in greater detail; summarizing the supply chain required for offshore wind development.

Subsequently, the Summit will host a panel of offshore wind developers. These entities will provide even greater detail about the development timeline of an offshore wind project, detailing the usual timing and needs of these projects. Following this panel will be a panel of vessel operators who will discuss the challenges they have faced as they broadened their scope of work to include offshore wind operations.

Finally, the event – as any good event in New Orleans should – will conclude with a cocktail reception where participants will be able to further their knowledge about these industries and further explore the topics discussed during the presentations.

The NOIA-OMSA Offshore Wind Summit will be open to all who want to attend; those wishing to attend should check www.NOIA.org or www.offshoremarine.org in the coming weeks for registration information.

In 1941, Mr. Brace was correct in his assessment that markets are hard to predict. That still rings true today. That is why it makes sense that NOIA and OMSA, organizations with long histories of helping advance the offshore energy industry, are helping their members apply their expertise to the emerging U.S. offshore wind market.

Timothy Charters *is Vice President of Government and Political Affairs at National Ocean Industries Association (NOIA).* ***Aaron Smith*** *is President and CEO of the Offshore Marine Service Association (OMSA).*

Lowering Shipbuilding Costs with Immersive Training

The fiercely competitive domestic boatbuilding industry looks for any advantage in the day-to-day battle for bottom line efficiencies. 'XR Technologies' offer an edge to shipyards as they grow their workforce.

By Matthew Wallace

In the shipyard, skills such as welding and coating are in high demand. The ability to lay down a proper bead, or perfect the mil build on a ship's hull can make the difference between a successful project and a failed inspection. XR technologies are valuable compliments to traditional training programs (XR is an umbrella category for virtual reality [VR], mixed reality [MR], and augmented reality [AR]). Efficient and effective XR supplemented training programs will speed the development of hands-on skills while reducing material costs and rework rates.

The use and effectiveness of XR technology, as noted below, has been examined by independent research. XR training tools are key to building sustainable, adaptable, and economical training programs. Trainees, instructors, administrators can all benefit from the value that XR technology brings to training.

XR Learning: Safe & Controlled

XR training tools teach by experience, recreating a real-world scenario in an accessible, safe, controlled, adaptable, and analytics-friendly environment. Ship simulators allow mariners to make drastic errors, all without breaking the ship in half. Similarly, in VR, welders can fuse an endless supply of metal plates together while painters can spend hours keeping the spray gun the proper distance from the ship's hull at no cost. Virtual, simulated exercises require less setup and prep to begin and come with innate repeatability – requiring little more than a 'redo' button.

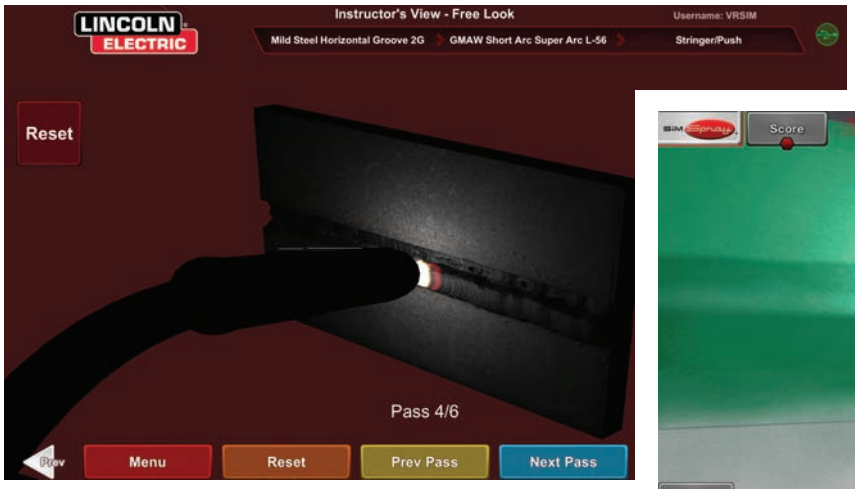
VR training programs offer direct and meaningful experiences, provide a safe venue for independent practice, and reduce restrictions on who can train when and where. In the hands of competent instructors, VR provides them with effective, efficient tools that expand their reach and effectiveness.

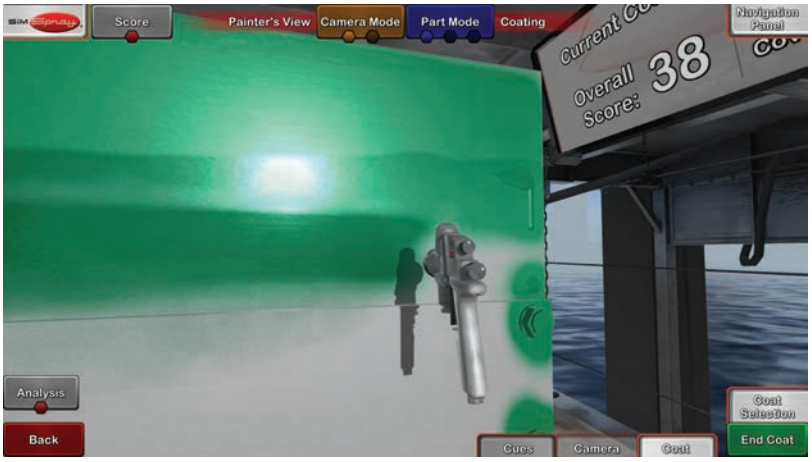
Shipyards worldwide use welding simulators to teach industry standard processes. For example, using Lincoln Electric's VRTEX 360, trainees can get intensive proactive training on a variety of joints and processes, in and out of position, all with instantaneous feedback. If a new trainee is struggling with penetration on his MiG pipe on plate weld, the simulator will help him perfect his gun position and complete the proper tie-in; or, a returning worker can be given a refresher course on completing a cap and fill on a 6" – 3G pipe.

VRTEX trains by familiarizing trainees with the fundamentals of successful welds. Lessons are accompanied by practical exercises, theory, and instructional replays. A trainee's virtual welds show defects such as slag and porosity just as they would when in real life. The simulator gives trainees a comprehensive tool to analyze their performance over time and identify where they can improve. Working with VR training tools like VRTEX, trainees gain familiarity with the equipment, materials, and physical skills required to be a quality welder. This prepares them for on-the-job training experiences, improves training investment returns, and produces capable workers, faster.

Marine organizations can expect similar results using VR for training coatings applicators. SimSpray uses VR to simulate coatings applications and abrasive blasting processes. As a trainee practices, he/she receives constant feedback on her gun angle or the impact of her painting speed. A trainee's poor technique creates defects. For example, if the trainee's positioning creates too much overlap, the mil build will be above specification. After each project, a detailed, actionable report summarizes the trainee's performance.

Score breakdowns highlight areas for improvement, such as poor transfer efficiency or erratic movement speed. Coverage and defect maps show an analysis of the mil build across the part and highlight any defects. Trainees can view their performance analysis on a pass-by-pass basis





with a 3D replay of their work while in the virtual environment. These tools help trainees eliminate flaws in their application technique. Integrated ROI tracking provides material costs that help quantify practical savings such as VOC emissions, cost of parts, cost of paint, training time.

An Objective Look at XR

Does it work? Can XR train a better worker? It turns out that the answer to both questions is "yes." In 2013, the University of Iowa published a study comparing a blended training approach (50% VR and 50% traditional) with traditional training methods. As predicted, simulation-based activities consumed fewer materials and completed more practice welds. What the study proved was that the blended approach's trainees met and exceeded the skill competency levels of their traditionally trained counterparts.

Trainees using the mix of VR and traditional training had 40% higher certification rates on the basic welds and better performances on the more difficult welds. The study also proved an unexpected benefit, increased rates of collaborative learning and open communication amongst the trainees. This is a remarkable expansion of trainee skills growth.

More collaborative and communicative trainees lead to more team-oriented members, strengthening the workforce. SimSpray applies the same training methodology as VRTEX and offers similar benefits. A top ten auto manufacturer reports SimSpray's ability to provide up to fifteen times more training in the same time interval.

Do XR solutions justify their use in today's training programs? Quantitative and anecdotal evidence demonstrate that VR training tools are capable of reducing material costs while providing more efficient use of training time. Properly implemented XR experiences can also provide immediate benefits in recruitment and evaluation, providing objective measurable insights into a new hire's practical job skills. With easy set-up and portability, XR applications make training simulations valuable attractions at career fairs and expositions. Potential recruits enjoy a preview of their future job set while the employer demonstrates commitments to employee safety, career pathways, and innovative practices.

Proven Value

In the maritime industry, XR training demonstrates the ability to recover implementation costs while bringing long term value to their programs. VR systems like SimSpray and VRTEX provide tools to create custom and adaptable training exercises while improving the feedback and analysis from those activities. Instructors and trainees gain valuable and actionable insights that are impractical or unavailable using traditional training scenarios. As more shipyards and repair facilities need better-trained workers while trying to reduce costs, XR training simulations become required critical tools for training.

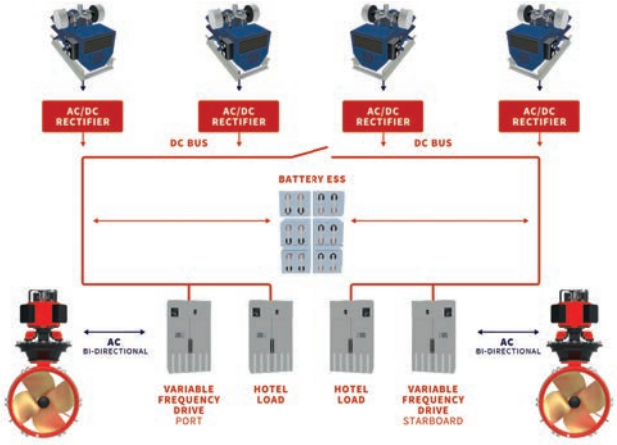
Matthew Wallace *is the CEO and President of VRSim, Inc., an established VR training system developer. VRSim is responsible for creation of SimSpray, and works in partnership with Lincoln Electric to develop the VRTEX product line. VRSim has developed custom and commercial VR, simulation, and software solutions for industry since 2001. Matthew leads the company through the perils and successes of VR technology and is renowned for his expertise on practical applications of VR.*

Thrustmaster Invests in the Future

For over 35 years, Houston-based Thrustmaster of Texas has been a manufacturer of thrusters and waterjets. Over time, their business plan has shown that continuous investment in knowledge and innovation has been the key to their continuing success. This business philosophy has led Thrustmaster to purchase the patents for an electric podded thruster and designs for hybrid propulsion systems.

This newly acquired technology includes T-Pod – an electric podded thruster from the Netherlands (Blue Thruster) and the ICON DP (dynamic positioning) system from Rolls Royce. The electric podded thrusters will be applied for the inland markets for a more efficient and robust hybrid or diesel electric package. Thrustmaster purchased the T-Pod technology in order to deliver a more complete, efficient, and versatile hybrid and diesel electric propulsion system package. Thrustmaster reports several projects in the works for both domestic and international Customers for ferries and tugs but has not yet to date sold a complete package as yet.

This interest in hybrid and diesel electric systems, according to Thrustmaster, is based in part in the challenges for industry in implementing Tier 4 requirements. These issues include significant weight and volume increases for the engine, the selective catalytic reduction technology required, the headache of urea after treatment, and the cost increase for tier 4 engines. Alternatively, Thrustmaster's electric podded thrusters and hybrid propulsion systems coupled together can offer a very intriguing new approach to the inland markets for both ferries and towboats.



SPECIFICATIONS DIESEL ELECTRIC PROPULSION SYSTEM

- Generator sets/Permanent Magnet Generators 4x
- Battery Energy Storage Systems 1x
- Permanent Magnet Motor T-Pod Thruster 2x
- Rectifiers
- Inverters
- Variable Frequency Drives
- Power Management System

The installation of three or four Tier III engines instead of two higher horsepower Tier IV engines allows operation with only one or two of these smaller engines running during loitering and periods of reduced power demand. The engines are running at relatively high load, efficiently, and clean, rather than slugging along below their design load at low fuel efficiency while expelling carbon deposits and half burnt diesel fuel. With Thrustmaster's hybrid propulsion system, multiple smaller Tier 3 gensets are used with a power management system to drive the electric thrusters. The use of Thrustmaster's electric podded thruster provides the additional benefits through its patented unique design using a permanent magnet motor located directly behind the propeller in a pod housing.

The thruster permanent magnet motor directly drives the propeller without the use of gear sets. This results in the most efficient thruster (there are no gear sets as are found in a traditional Z-drive and so it is more efficient and has less vibration), a quieter thruster (the motor is located directly behind the propeller in a pod housing in the water, rather than in the vessel as with traditional Z-drives) and increased space and weight savings in the vessel (the motor is located in the water in a pod housing rather than in the vessel and the thruster lacks the heavy gear and bearing sets of traditional L and Z drives). Permanent magnet motor developments have led to more compact designs with higher efficiency over all motor speeds. Permanent magnet technology consumes less fuel, is lighter weight, lower volume, and higher efficiency.

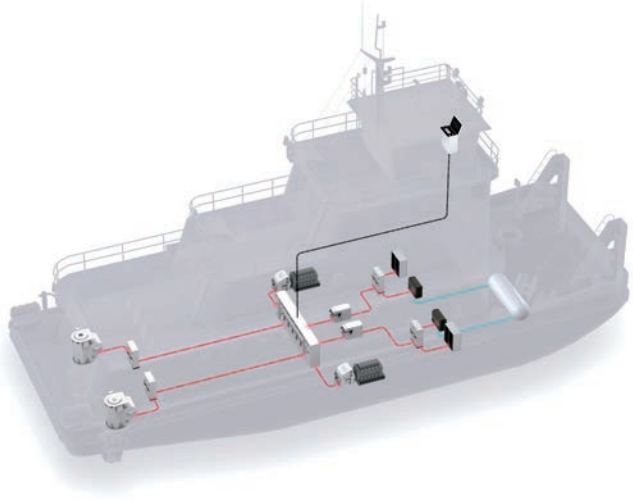
This innovative diesel electric with electric podded thruster package will be soon be offered in Thrustmaster's patented portable dynamic positioning package. This would consist of Thrustmaster's electric podded thruster in a portable outboard configuration similar to what Thrustmaster has produced for the past 35 years in its hydraulic podded configuration. A modular containerized diesel electric power unit would power the electric podded thruster and a portable DP control van outfitted with Thrustmaster's DP Icon control system (Thrustmaster recently purchased the IP of Rolls Royce's DP product) Thrustmaster would complete the package.

Lake Assault Fireboat Now on Duty in Georgia

Georgia's Rabun County Fire Services has placed a Lake Assault Boats fireboat into service on Lake Rabun, an 835-acre reservoir with 25 miles of shoreline. The new craft provides fire suppression and emergency response services. The craft can quickly transport water into a network of standpipes located along the shoreline to supply lake water for ground-based firefighting operations. Moreover, its deck-mounted monitor enables the craft to conduct direct fire attack. The fireboat is powered via twin 175 hp Mercury outboard engines, and features a 1,250-gpm fire pump driven by a marinized V-6 engine. The monitor has four discharge ports including one that feeds a 5-inch large diameter hose (LDH). Other features include a swing-out side dive door, and a Davit crane with two access points. The T-top pilothouse feature forward looking infrared (FLIR), sonar with side structure scan, chartplotter, and GPS.

ABB to Enable World's First Hydrogen-Powered River Vessel

ABB will provide a power and propulsion solution for a newbuild vessel operating along the Rhône river in France to run entirely on hydrogen fuel cells. ABB will provide a fuel cell based power and propulsion solution for a newbuilt push boat for the France-based Sogestran Group subsidiary Compagnie Fluviale de Transport (CFT), due for delivery in 2021. With hydrogen for the fuel cells sourced from shore-based renewable energy, the complete vessel energy chain will be emission-free. ABB has been working closely with Finnish research organization and project coordinator VTT and the leading global provider of innovative clean energy fuel cell solutions Ballard Power Systems Europe to develop an installation enabling a 400kW fuel cell to power vessel operations.



ESG Delivers First Newbuild USCG Sub-M Towboat for FMT

Eastern Shipbuilding Group announced the delivery of the M/V Brian Boudreaux on May 20, 2019. The Inland Towboat is the first new construction USCG Sub-M towboat for Florida Marine Transporters. It was in early 2018, when Florida Marine Transporters, LLC signed four more additional towboats, bringing the total to seventy (70) vessels contracted over the last 14 years. The vessel was constructed from a design furnished by Gilbert Associates, Inc. of Boston, MA. This order for these towboats originally began with a twenty-five (25) vessel contract, starting deliveries in 2006 and was successfully completed with on-time deliveries. It has expanded to become the largest single Owner, single Shipbuilder, new construction program with the same class towboat design in United States history.

BMT Wins Offshore Wind Vessel Contract for U.S. Market

BMT will design two advanced Crew Transfer Vessels (CTVs) for the expanding U.S. offshore wind industry. The vessels will service Ørsted's Coastal Virginia Offshore Wind Project. According to BMT, U.S. Workboats of Hubert, NC, and Senesco Marine of North Kingstown, RI will build the vessels. BMT has designed the new 20m CTV specifically for East Coast conditions with maneuverability, performance and redundancy in mind while reaching a top speed of 28 knots. The fully-classed CTV vessel, carrying 20 passengers, plus 4 crew, will be delivered early next year and is under construction, with the second earmarked for 2020. The endangered North Atlantic right whales have been a key driver in the design of this vessel, culminating in the smallest quad jet wind farm vessel that BMT has ever designed.

Armstrong Delivers Dive Compliance Vessel for WA DNR

The monohull dive compliance vessel Sentry was recently accepted by the Washington State Department of Natural Resources (DNR) after successful launch and sea trials. DNR has selected Armstrong Marine's proposal to design and build multiple vessels for their Marine Law Enforcement program. Sentry is customized for efficient geoduck fishery management along with other marine law enforcement operations. A 4' dive platform, tank racks, aft deck shower, and custom dive ladder serve DNR divers monitoring geoduck stock and habitat. The aggressive lines of Armstrong Marine's design lend presence well-suited for compliance missions, with vinyl graphics fitting of an official agency enforcement vessel. Sentry was the first unit delivered under this contract; the second vessel, currently in production, will be completed later this summer.

Peregrine Falcon: Bristol Bay Innovation

Peregrine Falcon boat builders, of Eagle River near Anchorage, AK, have a history of innovation from aluminum landing craft to Bristol Bay gillnetters. They recently sea trialed Bryan Mcmahan's Esa Ruth, the first of their latest pair of Bristol Bay boats that will be turning some heads on the Bay during this Summer's sockeye season. The boats 40-knot speed will stand out amongst the crowd of fast boats. But it will be their innovative design that will attract attention even dockside. Rather than the conventional forward cabin-design, these two craft have the cabin set aft on a raised platform that allows flexibility with the salmon gillnet. The boat, because of the raised wheelhouse, has much more deck space to pick fish.


Crowley

Zacharia Goldenberg Abisch Nichols


OMSA

Fuhrmann Wells


Welch


Remont


Danfoss

Sheff Menzer

Crowley Announces Leadership Additions

Crowley has announced that Commercial project management and engineering services both will move to Crowley's Shipping business unit. Leading that team will be **Shiju Zacharia**, who has been promoted to senior vice president and general manager. Zacharia, who joined Crowley in 2009, is a 2013 winner of the Thomas Crowley Award. Separately, Crowley Logistics announced that **John Abisch** and **Bob Goldenberg** have both joined the company. Abisch, vice president of global supply chain solutions, and Goldenberg, vice president, global business development, will be based in the company's Miami office. Abisch joins Crowley following a career with Econocaribe Consolidators in South Florida. Goldenberg also joins Crowley following a 30-year career with Econocaribe. Both men hold bachelor's degrees from the University of Florida. In yet another leadership announcement, Crowley Shipping announced that **Bryan Nichols** is moving to the company's marine services team as manager, business development. Nichols has built a 30-year career developing solutions for ship assist and escort tugboats.

OMSA Hires Fuhrmann

The Offshore Marine Service Association (OMSA) last month announced the resignation of long-time Vice President, **Richard Wells**. Subsequently, OMSA announced the hire of **Chad Fuhrmann** as Director of Regulatory Affairs. OMSA President, Aaron Smith said, "We are sorry to see Richard go, he has loyally served OMSA and the offshore industry for more than 10 years. We wish he and his wife, Joan, the best as they move to the next stage of their lives." Fuhrmann has been involved in the marine industry since 1998 when he sailed as an engineer for an OMSA member. Most recently, Fuhrmann chaired the National Offshore Safety Advisory Committee (NOSAC) subcommittee charged with making recommendations to the U.S. Coast Guard on how more domestic energy vessels could be used for disaster recovery.

Foss Welcomes New CFO

Foss Maritime Company announced that **Mike Welch** has joined the company as Chief Financial Officer (CFO). Prior to joining Foss, in his role as VP of Finance at Esterline Control & Communication Systems, he helped develop and implement new strategies and programs, resulting in improved profitability. Welch started his career in public accounting at a firm in Detroit, Michigan.

Bollinger Announces Promotion

Bollinger Shipyards announces the promotion of **Chris Remont** to Executive Vice President of New Construction Programs. Remont will assume responsibility of overseeing all commercial and government new construction programs for the Company. He has 25 years of shipyard and manufacturing experience and holds a BS in Electrical Engineering from Louisiana Tech University and earned his MBA from Nicholls State University.

Danfoss Names Public and Industry Affairs Director

Danfoss has announced the appointment of **John Sheff** as its new Director of Public and Industry Affairs for North America. Sheff will succeed **Mark Menzer** in the role when Menzer retires in July. Sheff previously was Business Development Manager for Danfoss in North America. He joined Danfoss five years ago after earning an MBA from the University of Maryland.

Sea Machines CEO Speaks at Global Entrepreneurship Summit

Sea Machines Robotics' Founder and CEO **Michael G. Johnson** was been named a leading distinguished speaker for Global Entrepreneurship Summit (GES) 2019, which took place in June, in The Hague, the Netherlands. Co-hosted annually by the United States and the Netherlands, this year's GES gathered leaders from government and private sectors to identify global opportunities for the next wave of entrepreneur-led innovation in scalable technology. "As is happening in other industries, Sea Machines is now leading the revolution in the


Johnson


Allan


Toma


Garner


Tadros

commercial marine space by pioneering autonomous control and advanced perception systems that make surface vessel operations more productive, predictable and safer," said Johnson.

Robert G. Allan presented with CMC Legacy Award

Robert G. (Rob) Allan was last month presented with the CMC Legacy Award at the 23rd BC Tugboat Conference held in Victoria, BC. The award is presented every two years by the Council of Marine Carriers (CMC) committee to a recipient who has made a significant, positive and lasting contribution to the BC marine towing industry. Allan joined Robert Allan Ltd. in 1973, and in 1981, succeeded his father as President, leading the company into a new generation of computer-based design technology. The expanding firm created a wide range of distinctive designs including ship-assist and escort tugs, icebreakers, government service vessels, and high-speed craft.

Furuno Welcomes Toma as Business Development Manager

Furuno USA has hired a new commercial business development manager. **George Toma** will play a key role in developing business relationships with commercial ship owners, operators, and builders around the country to promote the Furuno product line. George comes to Furuno with forty years of experience in the Maritime industry. A graduate of the United States Merchant Marine Academy, George's maritime roots run deep. He previously held the position of President and General Manager of Transas USA.

Gibbs & Cox Appoints Garner as AVP, Ship Design

Gibbs & Cox announced the appointment of **Matthew Garner** as Assistant Vice President, Ship Design. Garner joins Gibbs & Cox following a distinguished civil service career in the Naval Sea Systems (NAVSEA) Command's Engineering Directorate. For the past six years he was a member of the Senior Executive Service providing technical leadership and operationally superior war-fighting capabilities for the US Navy, most recently as the Director for Submarine/Submersible Design and Systems Engineering (NAVSEA 05U). Garner was awarded the Navy Superior Civilian Service Award in 2014 and Navy Meritorious Civilian Service Award in 2012.

American Club Names Tadros as Chief Legal Officer

The American P&I Club announced the recruitment of **Daniel A. Tadros** to the position of Chief Legal Officer, a key addition to SCB's senior management team. Mr. Tadros joined SCB on July 1, 2019, following his departure from his previous position as admiralty partner, and marine practice area coordinator at Chaffe McCall, LLP. Tadros is well-acquainted with the work of International P&I clubs and brings with him a wealth of expertise.

Huibers to Chair NMMA Engine Manufacturers Division

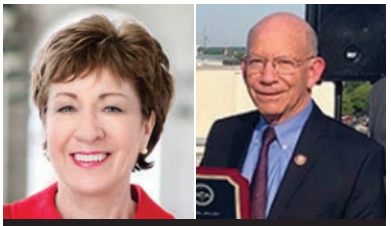
Ron Huibers, president and CEO of Volvo Penta of the Americas and a board member of the National Marine Manufacturers Association (NMMA), has been named chairman of the organization's Engine Manufacturer's Division (EMD) and appointed to its Executive Committee. NMMA serves as a unifying voice for the recreational boat industry, with member companies produce more than 80 percent of the boats, engines, trailers, accessories and gear used by boaters and anglers throughout North America.

Propeller Club Sets New Course for Advocacy

In his role as the new Executive Vice President of the International Propeller Club of the United States (IPCUS), **John Cullather**, is setting a course for the 50 American-based clubs, specifically, that involve streamlining and improving communication between ports and maritime policy issues and members of Congress. Cullather explained, "From the dredging of our harbors to the construction of lighthouses and the installation of aids-to-navigation, members of Congress have an enormous impact on maritime interests from coast-to-coast." Recently, IPCUS held its 35th Maritime Industry Salute to Congress Dinner at the Army Navy Country Club in Arlington, Virginia. This year's award was given to the Honorable **Cedric Richmond** (D-LA). U.S.

Huibers

(L-R) Richmond & Cullather



The Shipbuilders Council of America

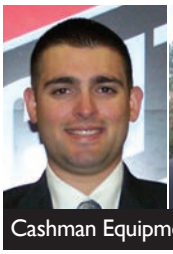
Collins DeFazio

Representative Cedric Richmond (LA-02) serves as co-chair of the Congressional Maritime Caucus. The Caucus raises awareness among members of Congress on a broad range of maritime-related topics.

SCA Honors Collins, DeFazio with Leadership Awards

The Shipbuilders Council of America (SCA) recently hosted its annual spring meeting in Washington, D.C. At the meeting, U.S. Senator **Susan Collins** (R-ME) was a 2019 recipient of SCA's prestigious Maritime Leadership Award. SCA also honored U.S. House of Representatives Chairman of the House Transportation & Infrastructure Committee, **Peter DeFazio** (R-OR) as a 2019 Maritime Leadership Award winner. As recipient of the Maritime Leadership Award, both are recognized as an exemplary leader in Congress who has demonstrated outstanding dedication and support of the U.S. shipbuilding and repair industry. "America's shipyard industry is vital to our national and economic security, and I am proud to represent a state with a longstanding shipbuilding tradition," said Sen. Collins. DeFazio added, "As we have seen, when we work together to fend off attacks on the Jones Act and focus on growing a vibrant, diverse, and globally competitive U.S. maritime industry, we can ensure the U.S. remains a great maritime nation. I look forward to keeping up the fight for the long haul."


King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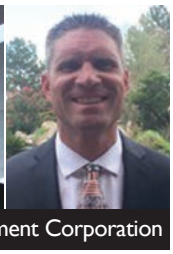
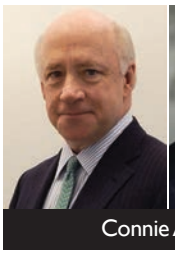

Hastings

Cashman Equipment Corporation


Chi


Stolzman


Shea


Lytle

Connie Award

TVIB Welcomes New Staff Member

The TVIB has expanded its staff by adding the position of Audit/Survey Coordinator by appointing **Caleb King** to the position. Initially, Caleb will be focused on coordinating the processing of audits and surveys while working to support TPO customers with CG-835V/Marine Casualty concerns. Caleb brings over 22 years of marine related experience, having most recently served as the Compliance Director for Inland Marine Service, where he was responsible for Subchapter M implementation and other related tasks. He previously served 23 years with the U. S. Coast Guard.

Cashman Expands Business Development Team

Cashman Equipment Corporation welcomed two new Business Development Managers to its sales team; **Nick Crow** and **Richard Hastings**. Both will help CEC in sales and business development focused in the Gulf of Mexico. Crow comes to Cashman with ten years industry experience. Prior to Cashman, Nick worked for Bechtel as their Senior Charterer where his duties included multi-voyage charter agreements, spot charters, rigging and stowage reviews, and project charter estimates. Nick is also the inventor of record on a Bechtel patent for the use of cameras for navigation during barge voyages. Nick holds a degree in Maritime Administration from Texas A&M Galveston. Hastings has over 17 years of oil & gas industry experience. Before joining Cashman, Rich worked with Cal Dive International for fourteen years. Rich holds a BBA from Texas State University.

POLB Appoints Director of Finance

The Long Beach Board of Harbor Commissioners has selected **Wei Chi** to lead the Finance Division at the nation's second-busiest seaport. Chi returns to the Port of Long Beach after working for several years as Deputy Executive Director, Comptroller for Los Angeles World Airports. Before landing at LAWA, Chi was an assistant chief financial officer for the Port of Long Beach from 2007 to 2008, where he was part of the executive team that spearheaded the San Pedro Bay Ports' Clean Trucks Program financial initiatives. Chi earned his MBA from the Wharton School and a BS in Chemical Engineering from Columbia University.

NOPB Names Stolzman General Manager

The New Orleans Public Belt Railroad Corporation (NOPB), a wholly owned subsidiary of the Port of New Orleans, has named **M.D. (Mike) Stolzman** as its new General Manager. Stolzman brings a high level of experience and industry knowledge to NOPB, having served in many leadership roles managing operations, budgets and rail lines during times of change and opportunity. He previously served as President of the Pacific Harbor Line (Anacostia Rail Holdings), which was named Short Line Railroad of the Year by the American Short Line Railroad Association in 2009 under his leadership.

Shea, Lytle to be honored at 2019 Connie Awards

William J. "Bill" Shea, Jr., Chief Executive Officer of Direct ChassisLink (DCLI), will receive the 2019 Connie Award presented by the Containerization and Intermodal Institute on September 17. Shea has been instrumental in shaping the strategic vision of DCLI and facilitating the acquisition of major legacy chassis fleets while maintaining oversight of the company's growth and financial performance. In addition, **J. Christopher Lytle**, the Executive Director of the Port of Oakland, CA will be presented with the Lifetime Achievement Award. Lytle was named as the Oakland port's top management position in 2013. Prior to assuming the position at the Port of Oakland, he served as the Executive Director at the Port of Long Beach. He has held various leadership positions at P&O Ports North America, Denmark-based APM (Maersk) Terminals, and Sea-Land Service, Inc.

In-Mar Solutions: Alu Pilot Chairs & Deck Rails

In-Mar Solutions offers a complete line of Alu Design & Services Marine Pilot Chairs and Deck Rails. There is a standard line in addition to the option for custom designs to suit specific needs. Sleek, modern design and maximum utility and comfort are emphasized.

www.inmarsolutions.com

FMC GlobalSat Broadband Access for Inland Cruise Vessel

FMC GlobalSat's reliable, secure, and cost-effective connectivity solutions for maritime customers has been chosen to provide its 4G/LT-SAT (Long-term Satellite) connectivity solution aboard all four American Queen Steamboat Company vessels, enabling internet broadband connectivity for more than one-thousand passengers on a daily basis. The system is currently operational aboard the American Queen and will be deployed fleetwide shortly.

www.FMCGlobalSat.com

Dometic's Titanium VARCX Chiller

Dometic's new titanium VARCX variable capacity chiller has two significant features - corrosion-resistant titanium and variable capacity technology for energy efficiency. The ground-breaking use of titanium condenser coils increases chiller longevity, ensuring seawater erosion and corrosion caused by marine organic growth are kept to a minimum. Dometic' VARCX modulates the compressor speed and balances chiller output with required load, keeping noise levels and energy costs to a minimum.

www.dometic.com

Survitec's New High-End Davit Range

A new range of davits designed to increase safety and reduce corrosion of critical parts has been introduced to the market by safety solutions specialist Survitec. The Survitec range includes different davit types suitable for liferafts, rescue boats and fast rescue craft. Made using marine grade stainless steel, the davits have been created to withstand the harsh environments in which they operate.

www.survitecgroup.com

The Fire Hose Carrier aka the Aqua Blaster

The patented Fire Hose Carrier known as the Aqua Blaster allows the user to have enhanced control of a charged fire hose line and nozzle with minimal strain and stress on the body. Aqua Blaster allows the user to use his torso area and the strength of his/her legs for leverage making it easier to maneuver and advance the fire hose; assisted or completely unassisted.

wkblocker2@sc.rr.com

ESAB's Powerful Cutmaster 58 Plasma Cutter

Thermal Dynamics, an ESAB brand, announced that its Cutmaster 58 handheld air plasma cutting system has been upgraded to include the SL60 QD 1Torch as standard. The power-to-weight ratio of this 60-amp, 43-lb. unit appeals to fabricators and repair personnel. It can pierce 5/8 in. mild steel, stainless or aluminum metal and has a maximum sever capacity of 1-1/4 in.

www.esab.com

Natural Gas Sensing Capability for LNG Powered Engines

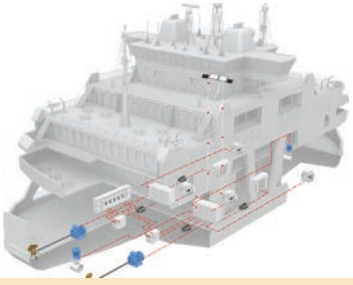
The Near Infrared Intelligent Sensor Natural Gas sensor from CMR Group reduces consumption levels of natural gas-powered engines through real time measurement of fuel quality. The sensor, directly connected to the gas feeder pipeline, is built around smart infrared hardware and data treatment software and features a CAN bus communications facility, which enables the system to be upgradeable without dismantling the sensor for improved performance and retro applications.

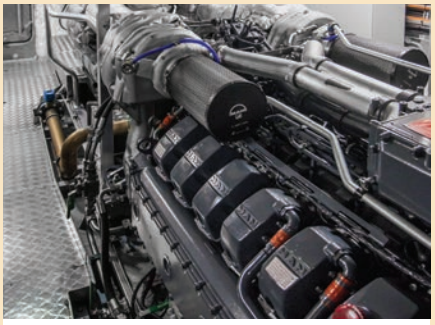
www.cmr-group.com

ABB's Onboard Microgrid for Small Vessel Fuel Economy

ABB's compact DC-based power distribution system offers hybrid power efficiencies to smaller vessels. The new Onboard Microgrid is based on the ABB power distribution system Onboard DC Grid with the proven ability to enable up to 20% energy efficiency in larger vessels. The launch of the compact-size solution allows ABB to provide efficiencies for smaller, lower-power vessels, running on batteries, fuel cells, or as fuel cell/battery hybrids.

https://new.abb.com/marine-ports





MAN's IMO Tier III Engine forWorkboats

MAN Engines now offers a 12-cylinder, IMO Tier III emission standards engines for workboats, spanning a comprehensive power range from 551 to 1,213 kW. Immediately available, this is particularly relevant to customers in Canada and US East and West Coast ECA's, who are now subject to regulatory limits around 70% stricter than IMO Tier II. Modular EAT allows for a wide range of installation possibilities.

www.man-mec.com

Evinrude Launches New 3-Cylinder E-TEC G2 Models

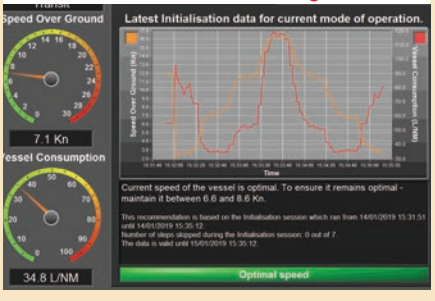
Evinrude announced the expansion of its Evinrude E-TEC G2 product line to include 115 H.O., 140HP and 150HP models. Evinrude's extended line-up provides operators on the water - in any situation. These models house a direct injection inline three-cylinder powerhead. With more torque and fuel efficiency at lower RPMs than comparable four-stroke engines, the E-TEC G2 models give extended cruising capabilities and more power when needed.

www.evinrude.com

Royston's EFMS ID's Best Speed for Fuel Economy

Diesel power specialist Royston has enhanced its Eco Speed analysis capability as part of its enginei electronic fuel management system (EFMS) to enable ship operators to identify and maintain optimum vessel speeds for efficient fuel usage across different operational modes. The Eco Speed feature enables shipping operators to manage vessel and fleet performance in the most efficient way possible without impacting on essential day to activities.

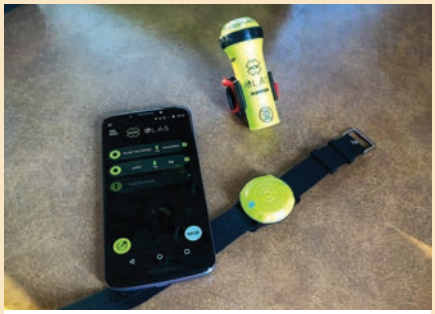
www.enginei.co.uk



Daniamant launches ODEO Strobe

Daniamant's ODEO Strobe, a high power white LED flashing light designed for use in emergency situations as a collision warning signal or to pinpoint the position of a vessel or individual in distress, builds on the proven design of the ODEO Distress. Featuring a high powered white strobe light, the ODEO Strobe has a 50cd luminosity intensity and can be detected from three nautical miles away.

www.daniamant.com



ACR Electronics Expands MOB Product Range

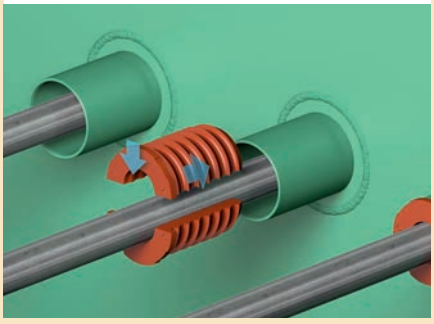
The ACR OLAS product line includes the ACR OLAS Tag and ACR OLAS Float-On MOB systems. ACR OLAS mobile application technology detects a break in the 'virtual tether' from the mobile device to the ACR OLAS MOB system within 8 seconds of falling overboard. The phone stores the GPS location, sounds a loud alarm, alerting crew before the OLAS app then provides directions to the GPS location.

www.acrartex.com

Beele's SLIPSIL XL-120 Sealing Plugs Deliver Fire Safety

Beele Engineering recently acquired the MED certificate for its SLIPSIL XL-120 plugs, which means they are CE certified in accordance with the Marine Equipment Directive 2014/90/EU. The certificate relates to the SLIPSIL XL-120 transit sealing system for steel, stainless steel, CuNi and copper pipes through decks and bulkheads in the A-60 class as well as for blind penetrations with SLIPSIL XL-120 blind plugs.

www.beele.com



Svitzer's New Line Handling Technology

Svitzer has begun sea trials of a remotely operated line catching technology prototype. The new innovative mechanism could significantly improve safety standards and reduce risks for crews during the process of connecting with other vessels, one of the most critical elements of towage operations. Svitzer's line catcher is remotely and safely operated from the wheelhouse and catches and secures the connecting vessel's heaving line.

www.svitzer.com

ABB Ability Marine Pilot Control integrates DP2 for Safety

ABB Ability Marine Pilot Control allows deploying joystick control for maneuvering at all times, including around the berth. Integrating DP2 functionality adds redundancy in technical design, ensuring that in the event of a single system fault, the vessel's position will be maintained. This functionality is particularly crucial for safe and reliable operation of construction and wind farm vessels working alongside fixed structures.

https://new.abb.com/marine-ports

Wilhelmsen's Rope Technology Promotes Safe Mooring

Mooring marine vessels is an incredibly high risk task. Serious, often fatal, accidents continue to happen with depressing regularity, with seemingly no end in sight. Until now. Wilhelmsen Ships Services' unique solution dramatically reduces a rope's recoil, or snap-back potential. The Snap Back Arrestor (SBA) is an energy absorbing core which sits within the company's Timm Master 12-strand plaited, mixed polymer rope.

www.wilhelmsen.com

COATINGS FOR INDUSTRY
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CFI Launches New Website

Coatings for Industry (CFI) has launched a completely new website, www.cficoatings.com, delivering in-depth resources to its customers and professionals across the many industries the company serves. CFI's new website contains nearly 300 pages of coating system recommendations, detailed information and applicator resources in a modern, responsive design optimized for all devices and browsers. It's a powerful resource for contractors, engineers, specifiers and asset owners.

www.cficoatings.com

ASSISTANT STOREKEEPER
Military Sealift Command
Salary: $33,295 Per Annum Full Time

Description:
Announcement #: 19-852-02EXOC Title, Series, Grade (Code) Assistant Storekeeper, WM 9994-15 (852) Base Salary: $33,295 Per Annum Type of Appointment: Excepted Service Career-Conditional Opening Date: February 11, 2019 Closing Date Open Continuously With Periodic Cutoffs Location: Military Sealift Command (MSC) Vessels Worldwide Who May Apply: All United States citizens and current Military Sealift Command Civil Service Mariner (CIVMAR) eligible to apply under the Veterans Employment Opportunities Act (VEOA). Active Duty Service Members (ADSMs) must submit a certification (i.e., statement of service) at the time of application which certifies that the service member is expected to be discharged or released from active duty service under honorable conditions not later than 120 days after the date the certification is submitted.

Duties: The Assistant Storekeeper is a Civil Service Mariner (CIVMAR) employed by the Navy to serve the Military Sealift Command (MSC) onboard naval auxiliaries and hybrid-manned warships worldwide, in peace and war. MSC exists to support the joint warfighter across the full spectrum of military operations. MSC provides on-time logistics, strategic sealift, as well as specialized missions anywhere in the world, in contested or uncontested environments.

The Assistant Storekeeper is responsible to the Supply Officer/Junior Supply Officer for performing Supply Department functions assigned in accordance with COMSCINST 3120 and 4000.2 series directives and Program Specific Directives. Follows procurement, receipt, storage, Quality Assurance (QA) and expenditure procedures for all types of material. This includes proper material identification, handling, inventory management, warehousing, packaging, and transportation.

Procures all shipboard requirements using Government/Commercial sources. Assists with configuration validations; processes and updates Allowance Change Requests (ACRs), Fleet COSAL Feedback Reports (FCFBRs) and Configuration Change Reports (CCRs) as directed. Assists with handling of Hazardous Material (HAZMAT) as directed. Also assists in the Supply Department requirement of monthly Financial Improvement and Audit Readiness (FIAR) inventories and their submission to Global Stock Control(GSC). Assists in the proper use of Supply automated programs.

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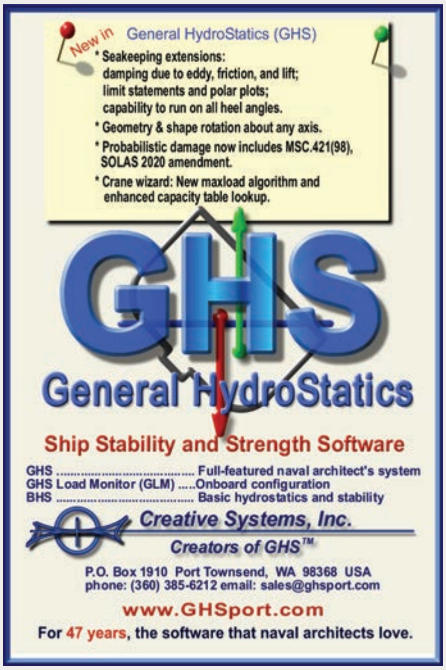

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Photo courtesy of Eastern Shipbuilding Group

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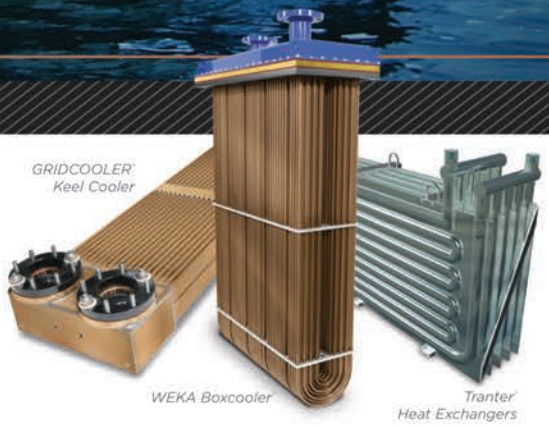
R.W. Fernstrum is committed to providing long-lasting, quality cooling systems. Our sales and engineering team will work with you to custom design a solution that meets the needs of your vessel and operating conditions.



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