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Volume 30 • Number 11

Marine News

NOVEMBER 2019

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The Workboat Annual

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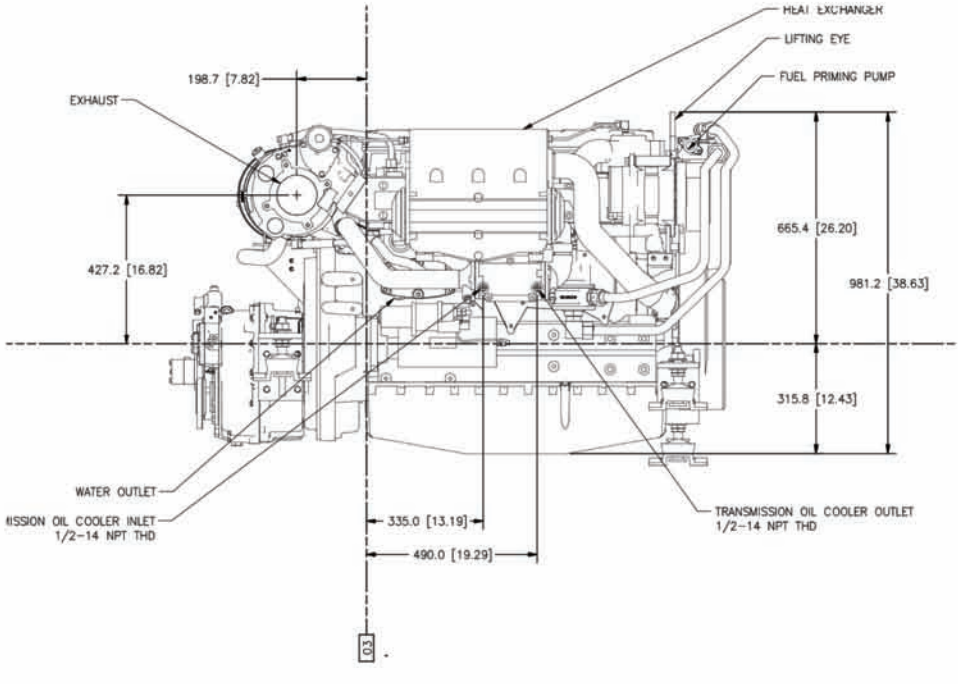

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ON THE COVER

The Norwegian Coastal Administration conducts a sea trial of the Emergency Vessel Attachment and Towing System (EVATS) in March, 2019. EVATS was developed by the Network in partnership with Glosten and Samson Rope Technologies. That story begins on page 22.

Image credit: Maritime Prevention & Response Network

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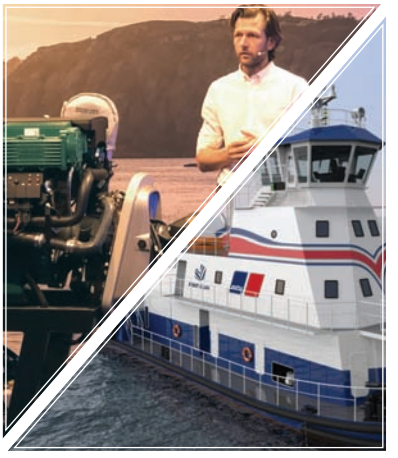
Departments & Analysis



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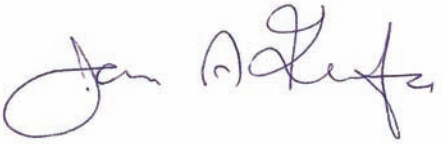
As we head briskly into November with that proverbial bone in our teeth, I find my mood evolving into a surprisingly upbeat place. And, that's got nothing to do with the fact that I'm one tuition check away from the *Promised Land* when it comes to underwriting my son's soon-to-be completed college education. But, it certainly doesn't hurt. Actually, my optimism stems largely from the rapidly approaching confluence of no less than three disruptive events that, for some, bring great anxiety. From my chair, however, the immediate future for the domestic waterfront looks bright indeed.

First and foremost, the slow approach of technology on the waterfront has evolved into a torrent of potential that's here to stay. It's on board, and it'll be there when your vessel takes 'last line' in the near future. Moreover, within this edition, Kongsberg's Vigleik Takle insists, *"... there are still maritime companies out there working within a traditional framework of manual processes which are becoming less relevant, practicable and competitive with every passing day."* He adds, *"... the need to adopt a considered long-term digital strategy becomes ever more pressing."* Now, I don't want to steal any more of his thunder, but the message is quite clear.

Part and parcel of that trend will, of course, be the also evolving concept of autonomous operations on the waterfront. That technology is already here and conventional wisdom tells us that it [first] holds the most promise for the workboat sector, where we tackle those 'dull, dirty and dangerous' tasks every day. Automation promises a safer, less mundane world; different equipment, with different (but more) jobs than we could ever imagine, and the corresponding need to learn different skill sets. That's a little scary. Think of it this way: just 40 years ago, I was still plotting radar contacts with a grease pencil. Today's millennial mariner probably thinks that's funny.

Leveraging all that autonomy and digital connectivity will next be the rapidly evolving (there's that word again) domestic offshore wind industry, which if the environmental lobby doesn't kill it first (go figure, right?), is set to explode. Domestic offshore wind brings with it all kinds of baggage, not the least of which involves a robust and fast-paced boat building program. Earlier in this missive, I characterized what's to come next as a confluence of events. Really, it represents a perfect storm that will transform the domestic waterfront and propel it into its next exciting (and lucrative) era.

There will be something for everyone: training requirements, a demand for new hulls and the hardware that fills those boats, employment opportunities – you name it. Vessel operators, financiers, educators, OEM's of every shape and size and of course those all those mariners can – and should – prosper in the 'new' workboat economy. Finally, and as we all should know, the U.S. merchant fleet (39,500 out of 40,000 hulls) is decidedly workboat centric. Auspicious winds are indeed blowing for our autonomous and digital future. That's something everyone can be happy about.



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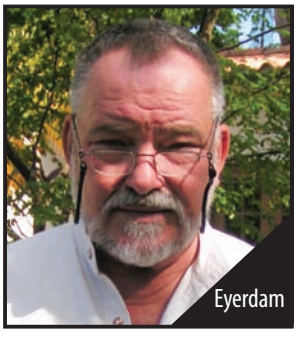
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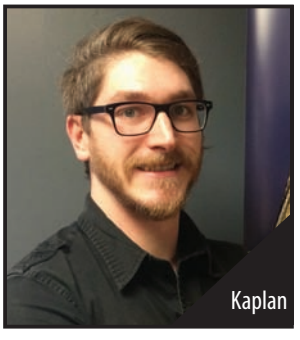
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Buddy Custard is the President and Chief Executive Officer of the Alaska Maritime Prevention & Response Network. He possesses extensive knowledge and expertise working maritime operations from both the public and private sectors, including serving with the U.S. Coast Guard for over 30 years attaining the rank of Captain and as an executive for an oil exploration and production company operating in the U.S. Arctic Outer Continental Shelf for over 3 years. Buddy holds broad knowledge on Arctic and Alaska maritime issues from both the industry's and government's perspective, ranging from search and rescue, oil spill prevention and response, offshore oil and gas exploration, law enforcement, fisheries management, domain awareness, and the significant challenges of working and supporting operations in both the Arctic and the waters of Alaska.

Robert Day, Head of Offshore at VesselsValue, is responsible for overseeing the analytical and commercial strategy of VV's Offshore product. Benefitting from Roberts extensive UK, Norwegian, South East Asian and US based market network, ensures VV's offering is kept to date and relevant for the latest market needs.

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Pat Folan is a partner in Tug & Barge Solutions and has operated towing vessels from Maine to Corpus Christi, TX, including the Alabama Rivers, Lower Mississippi, Great Lakes and Erie Canal. Tug & Barge Solutions exists to help companies and mariners adapt and then grow with SubM. Reach him at pat@tugandbargesolutions.com

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Chris Huxley-Reynard has 15 years' experience in the commercial marine and marine renewables industries. As a former founding director of Rolls Royce subsidiary Tidal Generation Ltd., he understands how to bring cutting edge R&D through to commercialisation. An aeronautical engineer by training, his broad experience in hydrodynamics, subsea electro-mechanical and software engineering, combined with his hands-on practical offshore experience, mean he brings a multi-disciplinary approach to solving engineering problems. Chris also lectures at Bristol University, England.

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US Offshore Support Vessel Analysis: 2018 and 2019

The US GOM Offshore Support Vessel (OSV) market is suffering, utilization remains poor, and many owners are still squeezed financially. However, a poor market forces people to adapt and for those willing to take risks, the upside can be extremely large.

US Owners 2018 vs. 2019: Within the US GOM, 2018 saw a period of strategic thinking and tactical business decisions. Tidewater Marine completed their merger with GulfMark Offshore to create the world's largest OSV player. With 250 vessels and a total fleet value of USD $1 billion, a new powerhouse was born to compete with the likes of Edison Chouest, both in the US GOM and globally.

Harvey Gulf successfully exited Chapter 11 restructuring within 77 days, with a clean balance sheet and fresh equity, ready for new business moves. Seacor Marine inked USD $130 million worth of new financing from a syndicate led by DNB Bank, looking to use some of the money for vessels acquisitions and growth. Hornbeck Offshore made an extremely well-timed purchase of 4 PSV's from fellow US owner Aries Marine for the bargain price of USD $36.6 million (Today's VV Value: USD 37.7 million).

2019 has seen a more offensive stance from US owners. Post-merger, Tidewater Marine has continued their aggressive scrapping of non-core tonnage, removing ~20 vessels from their fleet, explored possible acquisitions to renew the fleet, implemented their tier 1 OSV market standard and started to take advantage of their global fleet coverage (i.e. North Sea). Harvey Gulf continued exploring possible acquisition opportunities outside of the USGoM, notably looking to the North Sea, but nothing has materialized yet. They recently opened an office in one of the newest and most exciting oil and gas regions, Guyana, and won contracts both there and in Suriname. They have also expanded operations to West Africa, winning contracts in Nigeria. Hornbeck Offshore, one of the few US GOM owners to not utilize Chapter 11, announced a USD $100 million revolving credit facility with unnamed lenders.

In 2018 and 2019, US owners have been at the forefront of tackling this challenging market. Across the big pond in Europe, it's a very different story. European owners have not had the luxury of 'pressing the restart button' and utilizing the Chapter 11 process. Many still feel the effects from years of poor market conditions in the form of mounting debts and bank pressure. Examples include European titan Solstad Offshore who with USD $3.5 billion of debt on about 140 ships, admit they will need to undergo restructuring to improve their financial position. Market sources also suggest creditors could force Solstad to scrap their oldest vessels; as many as 25 ships. Havilla Shipping who in May 2019 logged a net deficit of $10.5 million for 2019 and have put two nonperforming vessels on the market for sale under bank pressure. DOF warned in late May that it was unlikely to be able to pay back some of its bank loans and be in breach of covenants. Finally, in July, French OSV owner Bourbon Offshore had lenders Chinas ICBC Leasing demand repayment of debts. In October, Bourbon received a takeover offer from lenders as part of its restructuring plan.

European owners (especially the Norwegians) will not be able to ignore the changing face of the competition within the North Sea for much longer. Post-merger, Tidewater has streamlined not only its fleet but also its processes and operation, resulting in lower overhead and OPEX. In the North Sea, a post-Chapter 11 version of Harvey Gulf is primed to apply pressure to more traditional market players.

US GOM Utilization: Utilization has been an issue over the last few years in all operating regions, but none more so than the US GOM. VesselsValue calculates utilization by using recency of AIS, whereby any vessel that has not signaled for greater than 8 weeks is considered to be laid up. Anything else is considered working. Average utilization for the region in 2018 was about 60% and for 2019, utilization stands at about 65%; an insignificant increase, year-on-year. Actually, the US Gulf in both 2019 and 2018 had the lowest utilization and far below that of other international regions.

US Owner / US GOM Utilization 2019: Regional utilization is one thing, but company vessel utilization is also an important metric. Which companies have a fully functioning and working fleet and which have chosen to put large number of vessels into layup? In Tables 2 and 3, we can see that offshore titan Edison Chouest has the lowest fleet utilization out of the selection of owners. However, this is purely due to the size of the owner's fleet. They have the highest number of active vessels. Interestingly, Hornbeck Offshore have more vessels laid up than active, at 54% of their fleet in layup, whereas a smaller owner, Odyssea Marine, has 100% utilization of its 14-vessel fleet.

OSV Values: OSV values, especially PSV values, suffered heavily in 2018. The workhorse of the Offshore industry was affected by market transactions such as the four vessel enbloc bank driven deal of the *Ram Nation* and *Ram Country* (3,800 DWT, 2014/2015, Leevac) and *Dwight S Ramsay* and *Betty Pfankuch* (5,600 DWT,

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2010/2011) for USD $36.6 mil. Also effecting values was the *Lewek Aquarius* (5,400 DWT, May 2012, Remontowa) being purchased for USD 11 mil SS/DD due, by REM Offshore. VV value's 'day before sale' was USD 14.8 mil. Over the course of 2018, VesselsValue data shows the value of a 0-to-5 year-old PSV dropped by ~20%.

2019 was slightly better year than 2018 for PSV values, but values did continue to soften. Indeed, VesselsValue data shows that over the course of 2019, the value of a 5-year-old PSV dropped ~10%.

Conclusion: US Owners have been extremely proactive over the last 2 years. Having adapted to the market, they are moving forward into 2020 and 2021 with renewed optimism and stimulation. However, all that glitters isn't gold, as the GOM as an operating region is still struggling compared to other global regions, and the global softening in values has done nothing for vessel and company values. Moreover, most reports suggest that US GOM oil production has been growing and shows no signs of slowing down. This growth has yet to filter down to the OSV owners and is unlikely to be seen in the short term which will continue to apply pressure to all owners.

Table 3 – GoM owner utilization specific figures

Company	Active	Laid Up	Total
Edison Chouest Offshore	45	59	104
Hornbeck Offshore Services	26	31	57
Tidewater Marine	27	15	42
Harvey Gulf Marine	26	15	41
Adriatic Marine	19	7	26
Odyssea Marine Inc	14		14

Table 1 - 2018 OSV Average utilization by Region

Region	Utilisation (Active Vessels)
US GOM	60%
Middle East	88%
North Sea	80%
S.E Asia	70%
West Africa	70%

VesselsValue

Table 2 - 2019 OSV Average utilization by region

Region	Utilisation (Active Vessels)
US GOM	65%
Middle East	84%
North Sea	87%
S.E Asia	75%
West Africa	88%

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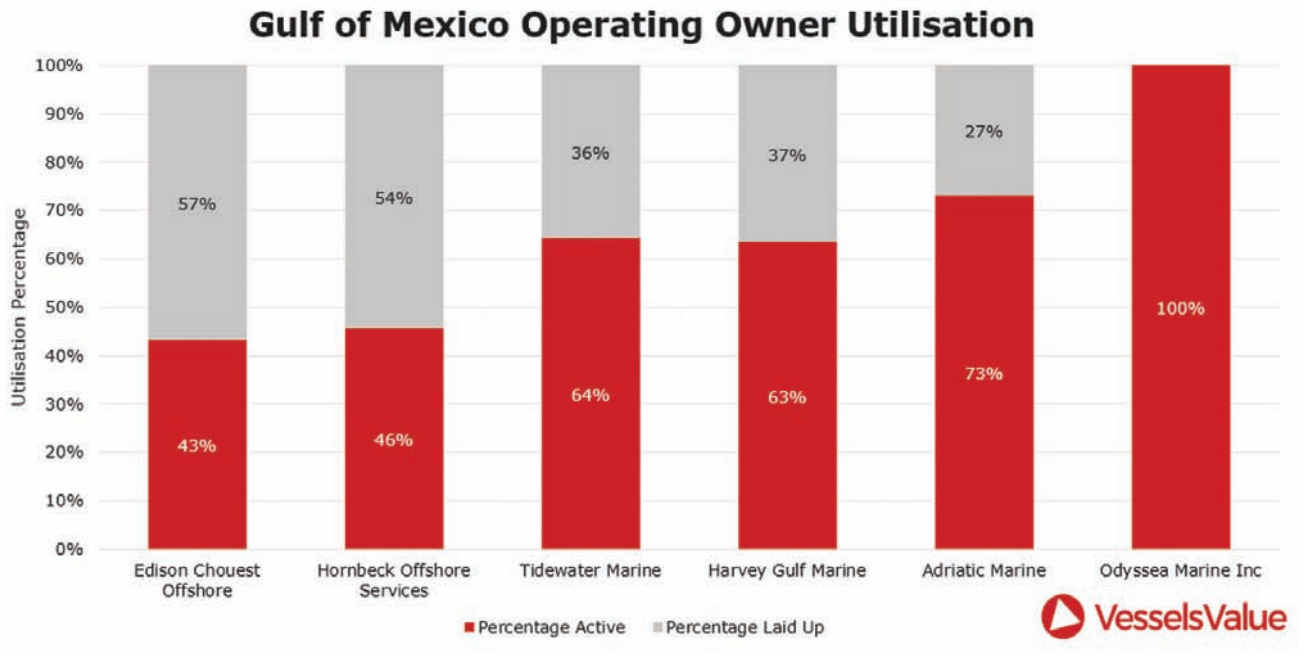

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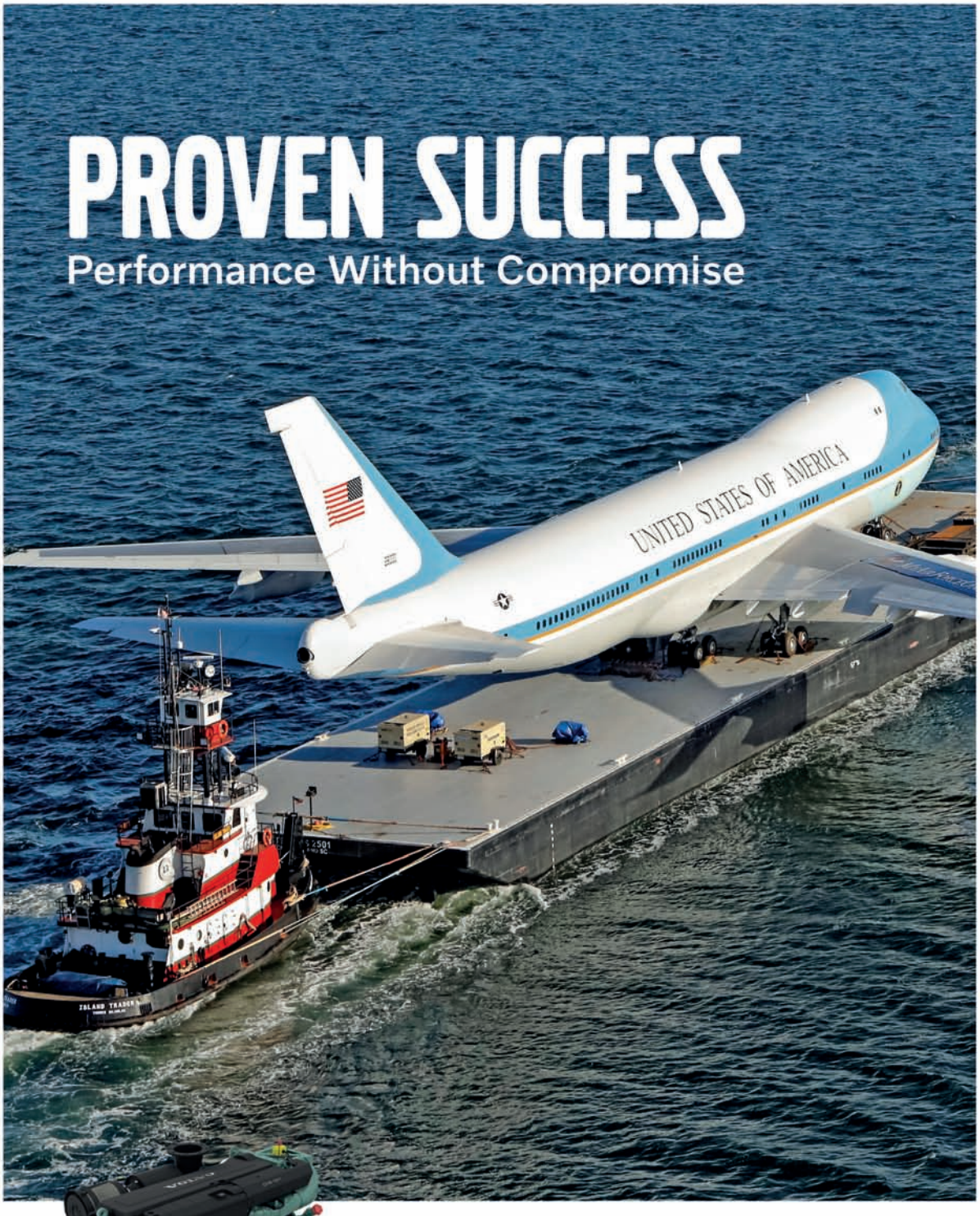

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President, R.W. Fernstrum & Company

Sean Fernstrum is a third-generation owner of R.W Fernstrum & Company. He graduated from Michigan Technological University in 1990 with a Bachelor of Science degree in Scientific and Technical Communications. After college, he came home to Menominee, Michigan and began working as a Technical Writer at R.W. Fernstrum & Company. He has been President of the company for the last 8 years. Sean has worked with a number of marine industry, local community, and charitable organizations throughout his career, including the PVA Associate Council, Rotary International, United States Power Squadrons, Boy Scouts of America, Advisory and Alumni Boards at Michigan Technological University.

It is no secret that R.W. Fernstrum & Company has been engineering and manufacturing GRIDCOOLER Keel Coolers for the marine industry since 1949. Fernstrum has since partnered with WEKA Boxcoolers B.V. and Tranter to expand its product offerings. These products are used for cooling marine propulsion engines, generator sets, reduction gears, and auxiliary systems onboard vessels of all sizes worldwide. Each solution is engineered to meet the requirements of a particular engine, vessel, and operating conditions.

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Fernstrum set the standard in marine cooling systems over 65 years ago, building a reputation focused on innovation. Indeed, the firm is arguably in a class by itself when it comes to discussing ***any*** marine OEM market vendors. *This month, listen in as Sean Fernstrum weighs in on how his firm arrived at its enviable market position, what comes next, and why:*

In an era of increasingly complicated regulations and sophisticated technologies disrupting the workboat sector, one piece of the equipment – the Keel Cooler – remains as possibly the most important and at the same time, the simplest piece of hardware on the water. That hasn't changed much over time, has it?

My grandfather started R. W. Fernstrum & Company in 1949. Over the past 70 years, we've seen the vessels in this industry evolve to meet the increased demands of today, both regulatory and operational. Successful equipment manufacturers have evolved their product lines as well. While the keel coolers we built in the past may look like our keel coolers today, and it's not uncommon to find our GRIDCOOLER keel coolers built back in the 1950's still in service today, most of those keel coolers wouldn't meet our current quality control requirements.

Although the keel cooler is an unquestionably simple piece of equipment, over time, there must have been tweaks and changes that improve the product line as it matches the changes and increases in technology on board a given hull. Give us some examples of that metric in play.

Back to evolution, as the steel alloy in boat hulls changed in the early 1970's, the hulls became less rigid and more flexible. This led us to tighten up our quality control specifications as well as make changes in the copper alloys we use in our tubing and the silver content of our braze wire. In 1981, the depression in our industry pushed us into custom designed units. Whether it one or one hundred (and it was a lot more of the one, than one hundred), we would make the customizations necessary to better meet the customer's needs and get that job. The 1990's lead us to a number of variations and improvements. Working with a customer to limit thru-hull fittings led to our Z-Option

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or flanged units. Improving the heat exchange in a given space led to our enhanced tubing. Work with one of our European representatives brought us the WEKA Boxcooler. More recently, we have our double stacked and angled tube units along with the addition of the Tranter product line. These are a few of the improvements and changes we've made, and there's more to come.

As EPA Tier levels move on up to levels 3 and 4, the mighty keel cooler has matched strides to make sure that cleaner air doesn't also mean poorly performing or out-of-service boats. In many cases, higher tier, cleaner engines also translate into much more heat generated in the engine spaces. How much (and where) have the tier changes impacted what you design and produce?

The impact has been in three key variables: heat exchange, coolant flow and coolant/seawater temperature differential. We need to dissipate more heat with less coolant in temperatures closer to ambient seawater temperature. This all means more surface area for the keel cooler to work properly. The same model engine with the same power rating at a different tier level is a very different animal.

Subchapter M rules, specifically those that that center on hull penetrations represent a potential challenge for operators that employ keel coolers. Fernstrum equipment is already in compliance with the U.S. Coast Guard's tough subchapter K requirements (for passenger vessels). Do these match what is now in effect for subM vessels? Tell us about the challenges facing inland towboat operators and where Fernstrum can provide the ideal solution(s).

In the passenger vessel market, the way to meet regulations on thru-hull fittings has been with cofferdams. The other way we have met the needs of that market is by providing our Z-Option units. For these installations, a pipe stub penetrates the hull and all of the fittings are external to the hull.

Your year-on-year sales, and year to date, are up significantly. What's driving those numbers and secondly, do you think this increased business reflects a general rebound in the workboat sectors as a whole?

I think we're seeing the most demand from the tug, pushboat and ferry markets, at this point. Customers are making demands on operators to move more goods with newer equipment. Cities are seeing their lack of expansion opportunities on land for transportation infrastructure and looking to navigable waterways as a solution. All of this means work for us. As one market segment falls, another usually picks up. Sure there's sometimes a lag and not all of those segments are created equal, but the work is out there if you look for it.

Because keel coolers are closed circuit cooling systems for a marine engine and these units are in direct contact with the ambient water, is the vessel's intended service – for example, warmer climates, Arctic operations, etc. – taken into consideration when designing a keel cooler for a particular vessel?

Absolutely. We have to always consider where a vessel will be designed to operate as well as where it's going to be

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built. A vessel built in the Gulf for service in Alaska has to have a cooling system designed for both conditions. You won't pass sea trials in 90 degree Gulf seawater on a vessel designed strictly for 55 degree Arctic seawater.

Inland operators have options when it comes to cooling requirements. That said; most inland marine vessel operators tend to prefer to be keel cooled because of the dirty, shallow water environments that they operate in. Why is this true?

Simplicity and reliability. Seawater pumps, seacocks, strainers and seawater piping are all eliminated with keel coolers, and how often do you think an operator wants to be dead in the water with 20 barges or a load of passengers while they spend 15 minutes changing out strainers?

Fernstrum's heat transfer testing occurs in-house, electronically with software and in test tanks at the Fernstrum facilities. You've invested a lot of time, talent and treasure in these testing facilities. Where is the testing done and how is that simulation accomplished?

Research and development is an important part of our business. While we've always been able to run a variety of physical tests in house at our facility, we've also had the ability to do CFD testing with our computer systems for some time now. The CFD testing allows us to test out new theories with lower costs and time requirements than physical testing. However, CFD can't replace physical testing. We always run physical tests on ideas that show promise in CFD before rolling them out into production.

Are all of your keel coolers manufactured here at home in the United States?

All of our FERNSTRUM GRIDCOOLER keel coolers are made here in Menominee, Michigan, and all of the WEKA Boxcoolers sold in the Americas are built here as well. All of the Tranter Platecoil and many of the Tranter Superchangers are made in Wichita Falls, Texas.

You frequently see a life cycle of 20 years for a copper nickel keel cooler. But, at the same time, some of your customers tell of keel coolers that have lasted 30 to 40 years, spanning even more than one repower job. That said; what's the warranty for one of your keel coolers?

Our copper-nickel keel coolers have a standard two year warranty. Our aluminum coolers have a 90 day warranty. Both should last a minimum 20 years.

Here and overseas, Fernstrum continues to drive trends in emerging markets. These include underwater tidal turbines, AUV's and ROV's. Tell us a bit about that work and what these markets entail when it comes to your product line.

You need to be able to create a real-world solution to a theoretical problem. That requires working closely with the project engineers, having the expertise and a clear understanding of what you can and can't manufacture in a product, and understanding how your product will operate in conjunction with other systems and sub-systems in an application.

And, speaking of foreign markets, dispelling the notion that U.S. firms – maritime firms in particular – can't compete overseas, Fernstrum does so and in a regular and robust fashion. If you can, share with us how much of your production eventually is shipped offshore. Where are your primary markets?

This year, about 30% of our sales are outside of the U.S. in 53 countries across 6 continents. Canada, South America, Europe and Asia make up the bulk of those sales. You can always compete. The key is being able to have good local representation in a given region.

The advent of hybrid systems has brought in new business – the business of cooling electronics, converters, transformers, and DC motors. What's the key difference in those applications as opposed to the areas that you have traditionally serviced?

We've worked with diesel-electric systems since the 1960's. We cooled prototype LNG and CNG systems in the 1990's. We've been doing electric and hybrid systems for years.

Given the increasing complexity of today's workboats and the advent of technology like never before on the water, the durable and simple GRIDCOOLER Keel Cooler is a piece of equipment that transcends those changes. Would you agree? And, what advice would you give the typical workboat operator looking for the right cooling solution?

Until we can conquer friction on all equipment with moving parts along with the ability to transfer 100% of power from one state or device to another, we will always have a need for heat dissipation. That's what we do. That's the problem we solve for our customers every day. If you're looking for a cooling solution, remember that you need a solution to YOUR problem, not a one-size-fits-all product that may or may not solve that problem.

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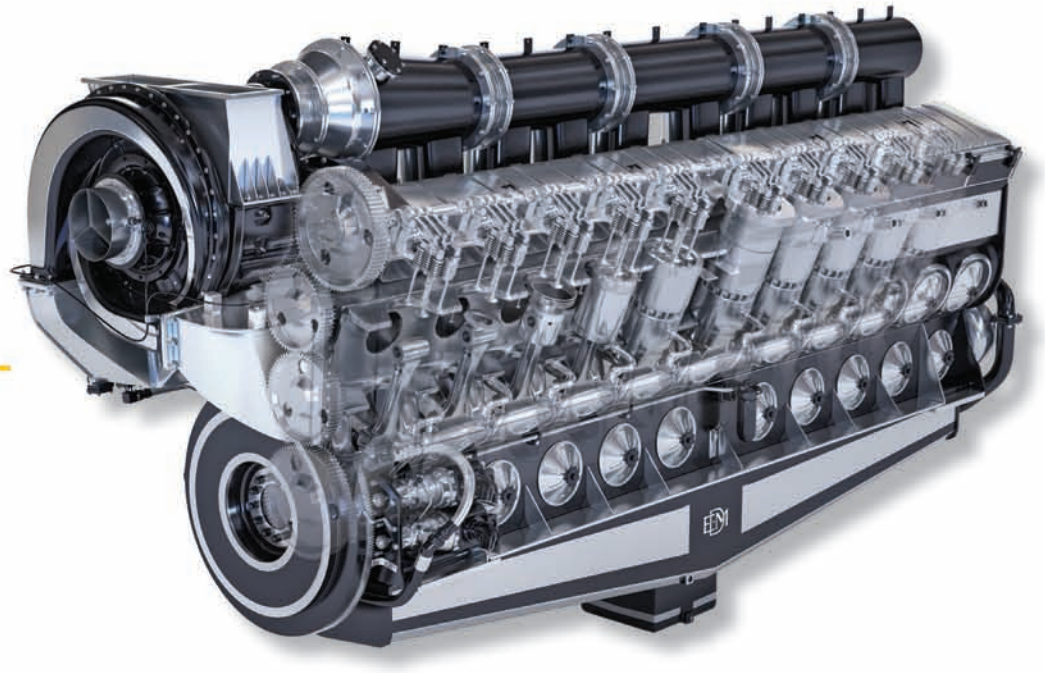

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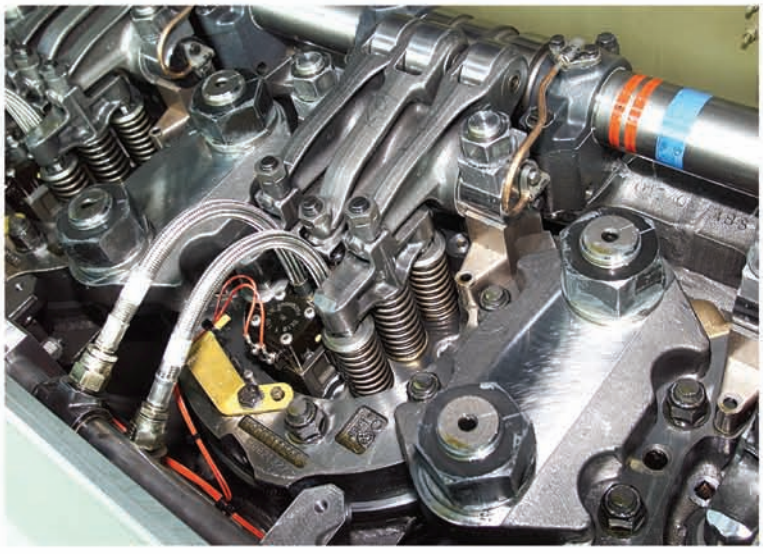

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Preserving the Arctic & Improving Maritime Safety

It's Time for Congress to Act.

By Buddy Custard

Custard

The Arctic remains one of the most amazing regions of the world, with diverse wildlife, ecosystems, and weather patterns. But the Arctic Is changing: after a summer of record temperatures and record-low sea ice, many are now realizing the Arctic will continue to play a significant role in maritime transportation in the years to come. At the Alaska Maritime Prevention and Response Network, we've seen these evolving changes first-hand as we assist vessel owners with maintaining compliance with federal maritime regulations.

As the Arctic changes, so too must our laws and policies designed to protect important maritime environments in the region. On September 26, the maritime industry marked the passage of World Maritime Day. It is with that context in mind that we call attention to the importance of improving safety and maintaining environmental protection within the maritime industry.

Almost 30 years ago, Congress passed the Oil Pollution Act of 1990 (OPA 90), a significant milestone in regulating oil spill prevention and response readiness in the United States. On the heels of the 1989 Exxon Valdez disaster in Alaska, OPA 90 fundamentally changed the way pollution response management is handled in the U.S., placing responsibility on vessel owners with the "polluter pays" principle, and creating prevention requirements, among other things.

While OPA 90 was a needed step forward in maritime safety, much has changed since then. The Arctic remains one of the most pristine ecosystems in the world, but it is also experiencing increasing military, maritime industry, and other commercial activity. Recent changes in climate have focused renewed attention on the Arctic region, including its potential as a marine transportation option, and the importance of environmental preservation.

The Arctic is unique; therefore, it follows that regulations protecting this region should be tailored to that uniqueness. Unfortunately, regulations resulting from OPA 90 have changed very little since 1990, and these regulations – primarily designed for the Lower 48 – fail to provide adequate standards for this last maritime frontier.

For example, OPA 90 has been interpreted by the Coast Guard to allow vessel owners to propose their own alterna-

The Norwegian Coastal Administration conducts a sea trial of the Emergency Vessel Attachment and Towing System (EVATS) in March, 2019. EVATS was developed by the Network in partnership with Glosten and Samson Rope Technologies.

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tives to meet key oil spill response requirements in Alaska and the Arctic. While flexibility is normally an asset for the maritime industry and the protection of the coastline of the contiguous states, in Alaska, this flexibility has only caused confusion and has resulted in unintended consequences, including a lack of consistency, clarity, and quality of oil spill prevention and response readiness. This has placed the U.S. Arctic region at increased risk of a spill or other disaster due to maritime activity.

This problem is exacerbated by the fact that more vessels are traversing this region than ever before. There are approximately 10,000 large ocean-going cargo vessel transits every year that sail through the southern U.S. Arctic region following trade routes from Asia to North America. This level of activity in the Arctic is unprecedented, and was not fully considered when OPA 90 was written.

The Network is an Alaska-based non-profit organization funded by the maritime industry, and we have a history of helping vessel owners maintain compliance with federal shipping guidelines in Alaska. We are keenly aware of OPA 90's shortfalls and the need for improvements. The Network provides not just oil spill response resources for our participants; we also invest in and consistently support efforts to pioneer innovative safety measures designed to prevent maritime incidents from happening in the first place. Our perspective is that reducing risk and improving response capacity go hand-in-hand.

It's time for Congress to amend OPA 90 to reflect the new realities of an evolving Arctic Region, and ensure its pristine environment is protected for generations to come. Oil spill prevention and response standards need to be specifically developed for this nationally-important and ecologically-sensitive area, and stakeholders' interests should be incorporated into planning and decision-making to advance oil spill preparedness. We must replace the current system of subjective and discretionary oil spill response alternatives with clear requirements and principles that incentivize incident prevention and swift response.

The size of the Arctic is daunting and the lack of infrastructure is challenging. As this final frontier of shipping opens up to the world, it is critical that we have guidelines in place to ensure its protection. Thirty years ago, in the wake of disaster, Congress acted swiftly, fundamentally shifting and improving maritime disaster policy. The time has come to revisit OPA 90 so that it reflects the unique challenges of the U.S. Arctic region. Congress must take a proactive approach – we cannot wait for a major oil spill disaster to be the mechanism that ultimately forces change. There is simply too much at stake. The time to act is now.

Buddy Custard *is the President and Chief Executive Officer of the Alaska Maritime Prevention & Response Network. He possesses extensive knowledge and expertise working maritime operations from both the public and private sectors, including serving with the U.S. Coast Guard for over 30 years attaining the rank of Captain and as an executive for an oil exploration and production company operating in the U.S. Arctic Outer Continental Shelf for over 3 years. Buddy holds broad knowledge on Arctic and Alaska maritime issues from both the industry's and government's perspective, ranging from search and rescue, oil spill prevention and response, offshore oil and gas exploration, law enforcement, fisheries management, domain awareness, and the significant challenges of working and supporting operations in both the Arctic and the waters of Alaska.* www.alaskaseas.org

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Dollars & Sense:

Making a Profit with a Safety Management System (SMS).

By Richard J. Paine, Jr.

Paine

Organizations in the maritime industry act no differently than any other successful global business unit. Major decisions are made with a certain underlying commitment – a commitment to customers, stakeholders and employees. That commitment can be oversimplified by stating the obvious, to generate revenue, but more specifically generate profits. Without profits, the company will not only fail to thrive, but will fail to survive. If poor fiscal business decisions are made, then the organization will not be able to continue to operate.

SMS: Cost vs. Benefit

So how does a profit relate to a Safety Management System? There remains an ongoing debate surrounding the cost versus benefits of choosing to operate with a Safety Management System (SMS). In some sectors, such as the tugboat & towing vessel industry, organizations are struggling with these decisions every day as they try to meet the Subchapter M regulatory changes brought on last summer.

Historically, some maritime industry stakeholders have held the position that the cost of SMS will eclipse the ultimate benefit to the bottom line. But, what if a Safety Management System (SMS) could offer your organization a profit?

A properly implemented safety management system (SMS) can help any maritime organization generate return on investment (ROI). First, it is important to lay out the costs associated with implementing and maintaining the SMS. Only then can an organization quantify future financial benefits through prevention of future loss.

The Safety Management System (SMS) is a systematic approach to the way an organization promotes and practices safety in the workplace while preventing risks and hazards through monitoring, measurement and corrective action. A SMS can be designed in many different fashions, but the overarching themes remain consistent. There is, however, a difference when it comes to oversight and requirements of a SMS. In short, all SMS' share similar core values, but they are not all the same. This difference will impact some of the expenses associated with the development, implementation and maintenance of the SMS.

The highest level of Safety Management Systems (SMS) are those set against international standards, such as the ISM Code or ISO 45001:2017. This level of SMS requires

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third-party registration and oversight, typically provided by IACS classification societies and registering bodies. This requires annual office audits and vessel audits. Based on the size of the operation and navigating areas, this type of system may be a requirement.

Other domestically regulated management systems include Subchapter M Towing Safety Management System (TSMS) which applies to the tugboat and towing vessel sector. This also requires Third-Party Organization (TPO) oversight. There are currently ten USCG approved TPOs.

Other voluntary safety management systems are supported by industry associations such as Passenger Vessel Association's (PVA) Flagship Management System or American Waterway Operators' Responsible Carrier Program (RCP). Importantly, Safety Management Systems can be designed for any size operation or industry.

Safety Management Systems that require third-party oversight will be more expensive due to the registration process and ongoing audits throughout certification. The costs will be relevant to the size of the operation and fleet. A small, one boat operation might spend s much as $15,000 annually, whereas that cost for a larger operation could increase exponentially.

System Development: Recouping those Costs

The development and implementation of a SMS will vary by the type of SMS the operator selects. The greater the oversight, the greater detail and time needed for the system to be implemented. Most certification audits will require 90 days of record at a minimum to sit for a registration audit. The development phase of the SMS, including risk assessment, program and procedure development, and training can take anywhere from a few weeks to months to complete. The additional costs associated with developing and implementing the SMS can be quite modest, or as much as $50,000 or more.

Unless you are in the safety business, safety doesn't generate revenue. Safety cultures and management systems prevent loss, and in many cases, significant financial loss. Hence, the properly implemented SMS, which addresses and mitigates risk, is a constantly evolving return on investment.

In actual practice, the most significant variable to the success of the operation, outside of equipment CAPEX, will always be the employees operating the equipment. Safety Management Systems place great emphasis on employee training and resources designed to minimize injuries in the workplace. Eliminating those injuries can all add up to a much more successful business. As an example, consider the following scenarios:

- *A general crew claim with a minor injury and the crewmember goes to a reputable doctor can be resolved for $10,000 to $20,000.*
- *A general crew claim with a minor injury and the crewmember goes to a doctor that leverages the injury can cost upwards of $100,000.*
- *A 'no liability' passenger claim that involves an outside attorney can cost the vessel operator from $200,000 to $500,000 in investigation and defense costs.*
- *A 'no liability' passenger claim that involves simple out of pocket medical expenses is usually resolved for no more than $10,000.*
- *A Hull & Machinery claim can reach $300,000, not counting off hire time and loss of operating revenues on charter, etc.*

Legal Defense

It doesn't matter if the organization transports oil, containers, dry bulk, or even passengers; waterborne com-

merce can come to a halt in the courtroom. That's because decisions made in the courtroom and even those cases that are settled outside the courts can have a 6-7 figure financial impact to the organization. However, a fully implemented SMS provides strategic benefits to an attorney.

Daniel J. Fitzgerald is Partner with the New York maritime law firm of Freehill Hogan & Mahar LLP. A Captain in the U.S. Coast Guard Reserve with over two decades of legal and marine safety and security experience, Fitzgerald told ***MarineNews***, "Jurors and Judges want to know that shipping companies have spent time and resources implementing management tools aimed at avoiding marine casualties and personal injuries. People need to be educated and describing the management practices utilized by a shipping company helps to 'personalize' the corporate defendant."

Beyond the corporate image, Fitzgerald agrees that the SMS is a proven benefit to the bottom line. "Companies with effective management systems have significantly less accidents and claims. Vessels are being operated safer than ever and losses at sea continue to decline. It's this systematic approach to safety that continues to change the game."

What's the bottom line? Safety management systems (SMS) will always have upfront and reoccurring costs, but when that SMS prevents one incident, one injury, or one breakdown, the savings to the organization will be sizable. But, finances aside, safety shouldn't be written in blood after the fact. Instead, make a profit for the organization by first investing time and resources as a way of preventing future losses. It turns out that Safety Management Systems do make sense – Dollars and Cents.

Richard Paine *is a licensed mariner, certified TSMS & AWO-RCP Lead Auditor and DPA with over 20 years of maritime and auditing experience ranging from deep sea, tugs & towing, and passenger vessels. He is an alumnus of SUNY Maritime College in both undergraduate and graduate studies. A member of PVA's Safety & Security Committee, he is currently is the Regional Director, HSSQE for Hornblower's NYC Ferry & Statue Cruises operations. Richard can be reached at* ***rjpainejr@gmail.com***

ISO: Affordable & Reliable Workboat Comms

The commercial shipping world can benefit from greater range of communications and reduced satellite costs. Domestic brown water operators know all too well that's easier said; than done. Until now.

By Joseph Keefe

In the fast moving world of blue water, deep draft shipping, the availability of reliable ship-to-shore communications has been a non-issue for at least two decades. More than ever, they need it. These longtime users of so-called ship management software and now, sophisticated remote monitoring systems that watch over even the most obscure minutia on board far flung 1,000 foot ocean liners, need (and get) robust and reliable communications.

On the domestic, brown water side of the equation? Not so much. The unreliability and patchwork coverage of cellular communications – both coastwise and on the inland rivers – has long bewitched brown water operators. To be fair, smaller workboats historically haven't had the need for robust vessel-to-shore connection. But, that reality is changing.

Take the subchapter M crowd for example; with 5,000+ previously uninspected vessels now expected to stand up safety management schemes. Long the standard out at sea, in coastwise routes, these software solutions were the exception, rather than the rule. And then, there's the evolving need for remote monitoring of equipment. Both require reliable and robust bandwidth to synchronize office and on board operational task sets.

The standard cellular connection won't cut it any longer. At the same time, the cost of satellite connections still (arguably) remains out of reach for many operators; especially the smaller 'mom and pop' fleets. What's a mother to do? One firm, long in the business of providing secure, reliable and critical connections to a raft of shoreside customers – private, NGO and government alike – says that they have the answer.

MEET AGILE MARINE TECHNOLOGIES

Agile Marine's ruggedized, longer-range hardware and services keep business going and connected while reducing communications costs. Although new to the commercial maritime space, this is also not their first rodeo.

Sheryar Wahid, Agile's co-founder and Chief Technical Officer told ***MarineNews*** in October, "We've had great success with an application Agile developed and real-world tested in Fort Lauderdale, a major city in Florida for a disaster response. First responders were able to achieve secure interoperable communications with radio, cellular and Wi-Fi. With our technology installed, their command center is able to manage the connectivity of disparate radios for communications and connectivity to LTE."

Agile reports a wide range of users for its systems and technology. For example, Doctors Without Borders (DWB) in Africa utilizes Agile's solution to access multiple cellular gateways to receive and make phone calls anywhere in the world. DWB staff can easily and reliably connect their laptops and communicate despite the fact that these locations are remote. Since the inception of this service, Agile has upgraded and improved the system and technology from 2G to 3G, allowing better connections and higher bandwidth.

Now looking outward from their initial customer base, Agile understands that when it comes to maritime operations, time is money and staying connected with Agile Marine Technology's new product line can avoid or reduce satellite

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Agile Marine touts a system that facilitates built-in GPS and seamless "smart routing" between cellular and satellite that can save up to 50% on satellite costs. That means marine customers don't have to rely solely on satellite coverage, while enjoying seamless communications at half the cost.

The intelligent hardware, named Agile 4Marine, is constantly checking all the different possible methods of communication that are available and will also select the most cost efficient one that provides a stable connection. Agile's routing engine checks for the existence of a connection, latency, the bandwidth of connectivity and references the lowest cost routing table, selecting the most economical and efficient connection type. Wahid adds, "If the Agile 4Marine does not find any other connection than satellite, only then will it select satellite. But, if a cellular connection is found, it will re-evaluate and switch over from satellite back to cellular."

Initially, Agile identified the yacht space first as a natural progression of its military grade package scaled for commercial use. "When we upgraded to the latest hardware technology in the beginning of 2019, we designed it to be natively applicable to marine applications, as well as the other solutions that we provide," said Wahid, continuing, "For this reason, we decided that it was the right time to enter the marine market and we look to satisfy both the blue water and brown/inland waterway customer."

NUTS AND BOLTS

At its heart, Agile's technology package and hardware is agnostic in that it can work with any cellular provider and/or SATCOM delivery system. Hence, existing satellite or cellular contracts probably won't be impacted by implementing the Agile system.

Here's how it works: Agile's marine line of military grade, ruggedized, long-range, multi-SIM card, smart routing communications technologies make maintaining cellular and internet connections seamless. The company estimates it can save on satellite costs as much as 50%. Agile Marine products boast the ability to conveniently and automatically switch from LTE to satellite and back. It covers a range of up to 25 miles offshore before automatic "smart routing" to satellite." For the coastwise, Jones Act trades, that adds up to real savings. For inland operators not accustomed to having 24/7/365 seamless comms, the world just got a little smaller.

Agile's state-of-the-art solutions load myriad local SIMs on a monthly regional plan. Using local carriers provides a stronger connection, more bandwidth and more capabilities beyond the traditional method of routing and satellite allowing operators to not only separate business from crew recreational use, but also resolve issues related to congested marine WiFi, spotty cellular connections or no connections whatsoever when offshore.

In a nutshell, Agile Marine's flagship product is an LTE communications solution for ships that reduces satellite costs and provides a more robust internet connection when near shore. Agile Marine products feature sophisticated software onboard to manage cell tower 'hand offs' when appropriate, maximizing signal strength while at the same time automatically searching for the best throughput connection available. The bonded LTE aggregates cellular connections to maintain session persistence even if one or more connection drops as the vessel moves through the

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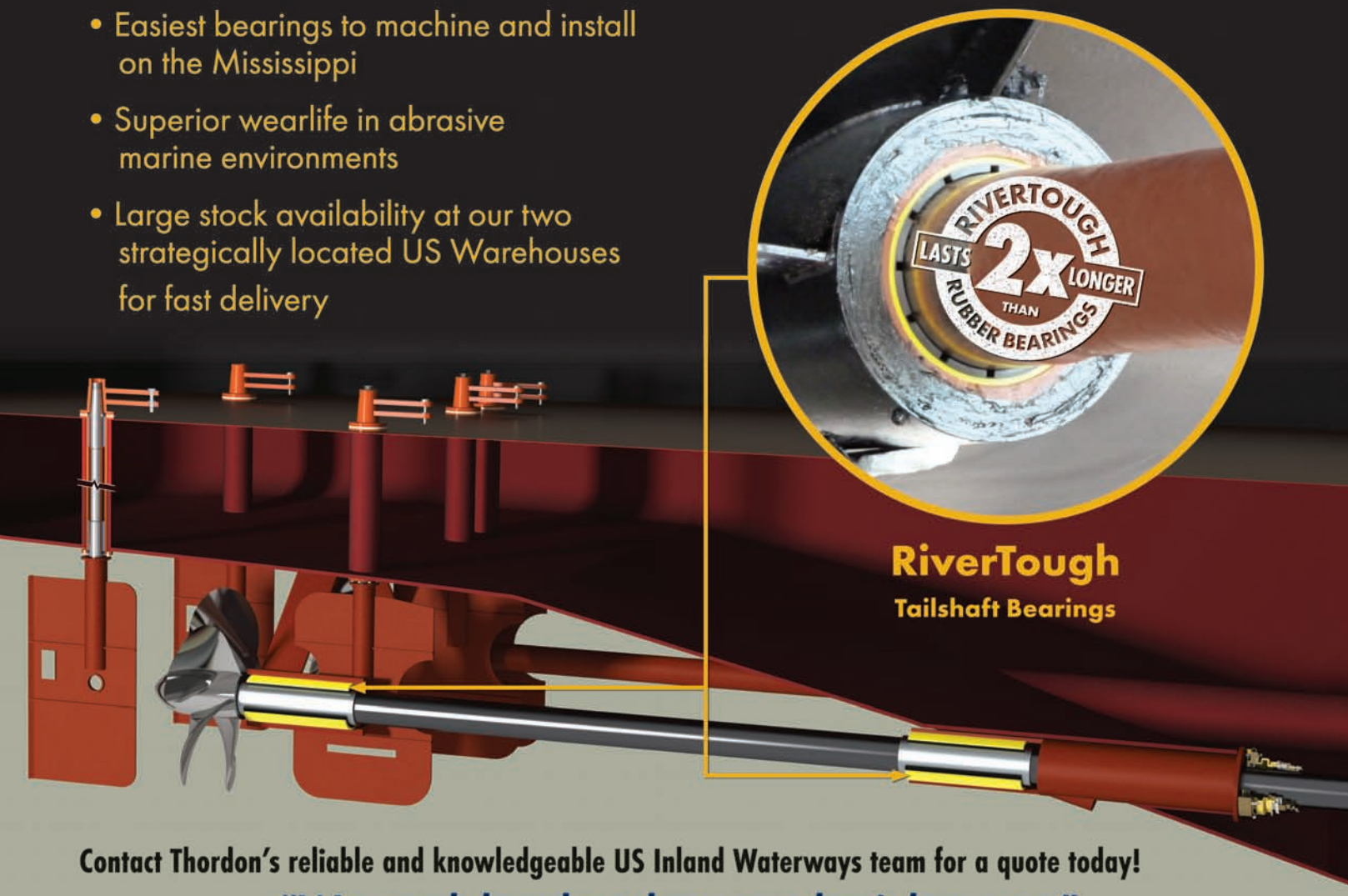

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"If the Agile 4Marine does not find any other connection than satellite, only then will it select satellite. But, if a cellular connection is found, it will re-evaluate and switch over from satellite back to cellular."

– Sheryar Wahid,
Agile's Co-Founder and Chief Technical Officer

water. This requires no action by the operator.

Agile 4Marine's U.S.-made ruggedized hardware package is taken from a solid aluminum block, designed to maximize the surface area for superior cooling, while the interior of the case is cut to the exact shape of the boards inside so that the cellular radios and processors are directly contacting the aluminum. This maximizes heat exchange allowing operations in increased temperatures, eliminating the risk of employing a cooling fan that often fails.

That the hardware's physical footprint measures just 6"x6"x2"making it ideal for workboats – inland pushboats, for example – where space is always at a premium. Installation requires a single connection to power with a second cable connection to antennas and GPS.

NAVIGATE YOUR BOTTOM LINE: BE MORE AGILE

The savings can add up, especially for those who never before thought that they could afford technologies such as remote monitoring. Indeed, a recent study extolled the possibilities of insurance breaks (reduced premiums) for those who use remote monitoring. Wahid explains, "Every insurance company has their own criteria and credentials for what is available in terms of discounts. This will become one of the stipulations of an ongoing communications stream, from vessels to shore. One day, it will become a requirement but today, it is just provided in the form of a discount."

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The percentage of savings achieved is determined by several factors. First, this might depend on the amount of time the vessel is spending on cellular coverage in inland waterways and coastal areas, as compared to the time spent on open oceans without cellular service. A second factor involves how much a customer is currently paying for satellite service. A third factor is the amount of communications they choose to allow from ship to shore on satellite vs. when they are in coastal or inland water areas. Depending on the variables, savings can exceed 50%.

With regard to the satellite portion of the equation, Agile touts what they say is 'a low standby charge.' We asked what that means in real practice. He replied, "This is referring to the standby charge for the satellite portion of the service. The standby charge allows the customer to have the ability to access satellite communications when needed and limits the ongoing charge to an access fee. If there is no activity on the satellite side, there is no additional charge but, the ability and contingency of 'sailing over' to satellite, if nothing else is available, is there."

Beyond this, he adds, the customer does not have to do anything with the equipment for this to occur, because it is automatic.

AGILE … AND FLEXIBLE

While this isn't Agile's first rodeo when it comes to providing critical comms, it is their first foray into the marine space. It's also true that other service providers serve similar markets and they were here first. The ability to toggle back and forth from SATCOM to cellular, as necessary and according to what service is available where, isn't unique to Agile. Nevertheless, says Wahid, "We are unique and we believe superior. Our software is much more comprehensive because it automatically addresses many more circumstances than the competition as it selects the best choice of low cost and stable communications."

With Agile, customers can buy on a menu basis. For example, a user might choose to only buy the hardware that goes on the ship or they can choose to buy the hardware plus the fusion server virtual SIM service that they can locate in their own facility. That said; they can buy the hardware, pay for the monthly service for the Virtual SIM and the cellular airtime, as well.

With a nod to the typical inland pushboat operator running the length of the Mississippi River, the Agile platform was designed to transmit large volumes of data over the cellular network. The greater range of the device means that the cellular coverage area is greater, resulting in minimal need for satellite usage. The virtual SIM server automatically switches between multiple cellular carriers, eliminating roaming charges and automatically choosing the provider that will give the strongest connection to the tower.

When it comes to the domestic waterfront, advancements over time have long been measured in increased deadweight tonnage, LOA and other similar metrics. Those days are over. Technology has arrived on the docks, and it now departs regularly with the vessel when it takes 'last line.' The final piece of that equation, especially for the workboat sector, is the communications piece.

So, what about your firm? Will your transition to the next level be *Agile?* If not, it may not come at all.

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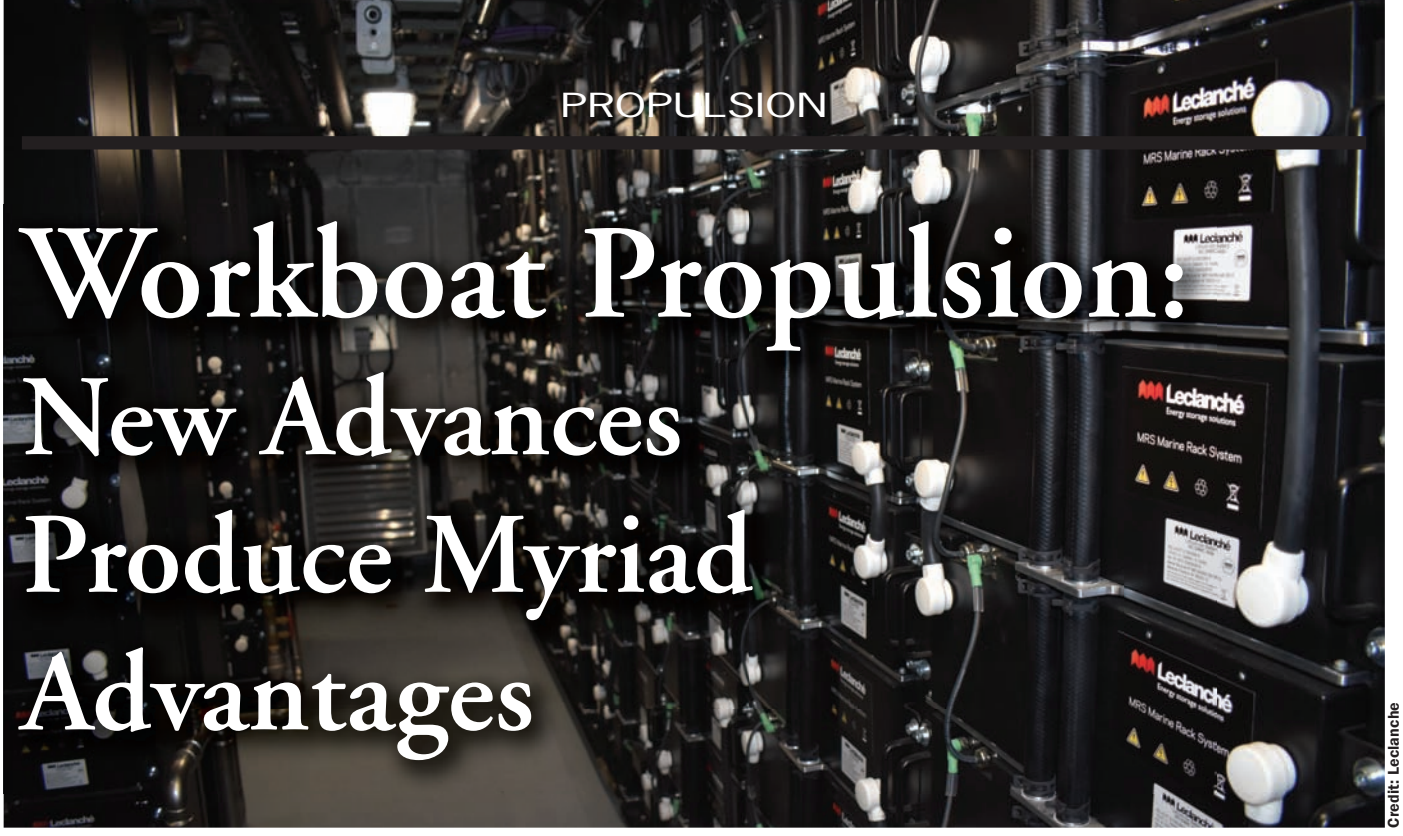
Workboat Propulsion: New Advances Produce Myriad Advantages



Credit: Leclanche

Big changes are blowing in the wind for 2019 Brown Water propulsion systems – and beyond.

By Rick Eyerdam

As the final quarter of 2019 winds into full gear, myriad issues, challenges and developments are impacting the North American brown water, shallow draft workboat markets in particular. To sort it all out, ***MarineNews*** turned to some of the leading brown water manufacturers of propulsion systems. Among these, Yanmar, Cimco (OXE), ABB, Torqeedo, MTU, Leclanché SA, Danfoss Editron and others responded with their version of *'what's hot, why, and what that all means for today's powerplants and tomorrow's promises.'*

We started out by asking, *"What makes your engines / propulsion systems the better choice for any brown water application?"* From that emerged the top achievements for these OEM's in 2019 and a closer look at the future of this promising category. **Spoiler alert:** Batteries, very big batteries, and AC motors.

LECLANCHÉ FOR (BATTERY) POWER, DANFOSS EDITRON TO CONVERT AND DISTRIBUTE IT

"E-Ferry Ellen," the world's largest all-electric ferry, has made its maiden voyage connecting the island of Aerø, population 6,000, to the rest of Denmark. The route is 22 nautical miles long. The ship is capable of carrying 30 vehicles and 200 passengers in summer. It is powered by the largest portable DC battery system ever, with an unprecedented capacity of 4.3 megawatts (MWh) provided by Leclanché SA, one of the world's leading energy storage companies. The operators estimate the electric ferry will save over 2,000 tons of CO2 per year in its operation.

The battery system supplied by Leclanché in the E-ferry Ellen is a proprietary high-energy graphite/NMC (nickel-manganese cobalt lithium oxide) and LTO (titanate lithium oxide) cells, according to Dean Jennings, vice president of Leclanche's e-Marine business.

These are G-NMC lithium-ion cells with unique safety features, including a bi-cellular laminated design and ceramic separators. Leclanché specifically designs and engineers a Class Type Approved and Certified Marine Rack Systems (MRS) including fire prevention and extinguishing systems. The project has received the DNV-GL Type Approval Certificate, the DNV-GL Product Certificate and the NMA certificate for Danish waters, Jennings said.

Image above: The battery system supplied by Leclanché in the E-ferry Ellen is a proprietary high-energy graphite/NMC (nickel-manganese cobalt lithium oxide) and LTO (titanate lithium oxide) cells, according to Dean Jennings, vice president of Leclanche's e-Marine business.

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Credit: ABB

The ferry's Aurora and Tycho Brahe, originally built in 1991,were converted to battery power with 4160 kWh batteries on board each vessel. The scope of the project also included battery racks, ABB's award-winning power distribution system Onboard DC Grid, as well as energy storage control systems. The ferries annually transfer more than to 7.4 million passengers and 1.9 million vehicles between Helsingør, Denmark, and Helsingborg, Sweden.

The Ellen E-ferry will travel at speeds between 13-15.5 knots and it is capable of carrying 198 passengers in summer months, with this capacity dropping to 147 during the winter. The ferry can also carry 31 cars or five trucks on its open deck. The vessel has the largest battery pack currently installed for maritime use and it is also the first electric ferry to have no emergency back-up generator on board. The parallel and redundant battery and power train systems make the E-ferry a safe and reliable vessel. The E-ferry has been designed with unique integrated battery and transmission systems that offer unparalleled operating efficiency.

Danfoss supplies the full-electric drive train powering the ferry. The company's EDITRON system comprises two propulsion motors and two thruster motors, as well as the electric drive train, When the batteries release the 4.3MWh of direct current, the Danfoss Editron system provides the vessel's power management system for the complete onboard-automated power and load control.

Additionally, the company delivered the onshore charging station and charging arm for the ferry's 4.3-megawatt battery.

Additionally, says Jennings, Leclanche's partnership with Kongsberg Maritime has the two firms in active collaboration in 2018 and 2019 with Leclanche's batteries an integral part of Kongsberg hybrid solutions.

Yara Birkeland is the world's first autonomous, battery powered and zero-emission container vessel. Ready for launch in 2020 at the earliest, Yara Birkeland will gradually move from manned operation to fully autonomous operation during its first two years of operation. Yara and technology company Kongsberg have teamed up to build this game-changing vessel. Replacing 40,000 truck journeys a year, Yara Birkeland will reduce NOx and CO2 emissions and improve road safety in a densely populated urban area in Norway.

The second project relates to nine vessels known as Grimaldi Green 5th Generation (GG5G). Grimaldi is one of the world's largest operators of Roll-on/ Roll-off (Ro-Ro) and Roll-on/ Roll-off Passenger (Ro-Pax) vessels. The hybrid propulsion system delivered by Kongsberg includes supply and integration of shaft generators, frequency drives, energy management systems together with Leclanché battery systems. The GG5Gs will be the first in a new series of hybrid Ro-Ro vessels using fossil fuel during navigation, with batteries providing a peak-shaving function and electricity in port.

ABB AZIPOD PROPULSORS FOR FERRIES AND ROPAX

In response to customer requests, ABB has filled the gap between the low and high-power range of Azipod propulsors with the launch of a new series available in 7.5-14.5MW. In addition to ferry and RoPax vessels, this power range will also be applicable for larger offshore construction vessels, midsize cruise ships and shuttle tankers. With this expansion, the Azipod propulsion family now

covers the power range of 1-22MW.

Recent breakthrough orders in the ferry segment include the Azipod propulsion system specified for an LNG-powered vessel due for delivery to Viking Line next year. Azipod propulsion was also preferred by Wasaline for the recently ordered dual-fuel and battery power ferry, which will operate between Sweden and Finland.

ABB's Azipod propulsion is a gearless steerable propulsion system where the electric drive motor is in a submerged pod outside the ship hull. Azipod units can rotate 360 degrees to increase maneuverability and operating efficiency, with the proven ability to cut fuel consumption by up to 20 percent compared to traditional shaft line propulsion systems.

At the core of the new mid-power range are ABB's latest fourth generation permanent magnet motors, which draw on proven Azipod propulsion technologies but have been refined to increase power and maximize efficiency. Additionally, the latest 'M' series of Azipod propulsion feature technical advantages tailored to provide operating benefits for ferry and RoPax owners and operators.

The mid-power range propulsion units have been designed for low onboard height, which allows placing the Azipod system under the car deck of RoPax vessels, ensuring smooth loading and unloading of vehicles, as well as allowing for maximizing the deck space. The design simplicity of the propulsion system provides increased robustness and reliability, at the same time allowing for ease of maintenance.

An independent study by Deltamarin, a ship design, offshore engineering and construction group, where a RoPax vessel equipped with the Azipod system was compared to a conventional vessel with shaft line propulsion, has shown average savings in fuel and energy consumption equivalent to $1.7 million annually. Lower fuel consumption also means that the Azipod-powered ferry would reduce CO2 emissions by approximately 10,000 tons per year. This is equivalent to the amount of carbon dioxide emitted by about 2,200 passenger cars annually.

In addition, the two ferries operated by ForSea on a 4km route between Denmark and Sweden have undergone conversion from a conventional diesel engine operations to battery power, joining the world's largest emission-free electric ferries.

The conversion project of the two ferries, originally built in 1991, included an installation of 4160 kWh batteries on board each vessel. The scope of the project also included battery racks, ABB's award-winning power distribution system Onboard DC Grid, as well as energy storage control systems.

Tycho Brahe and Aurora annually transfer more than to 7.4 million passengers and 1.9 million vehicles between Helsingør, Denmark, and Helsingborg, Sweden.

"We are delighted that the entire system is in place to support the emissions-free operations we envisaged from the outset," said Johan Röstin, CEO, ForSea. "This is a truly groundbreaking project and the work we have done with ABB will offer invaluable lessons for those following our lead."

Credit: Leclanche

TORQEEDO DOES IT ALL

"Torqeedo (Deutz Group) was founded in 2005 in Starnberg, Germany, to develop and bring to market a line of marine electric propulsion systems. Today, we have more than 90,000 electric and hybrid marine systems in service around the world," said Steve Trkla, president of Torpeedo USA.

"We offer total helm-to-prop propulsion solutions to meet each vessel's unique requirements, including the electric motor, lithium-ion batteries, drives, controls and integration with solar, hydro and diesel on-board recharging. In the brown-water segment you'll find our systems on workboats, ferries, excursion boats, water taxis, patrol vessels, lifeboats, self-propelled barges, rental fleet operations, utility vessels and robotic autonomous research vessels," he said.

The Ellen E-ferry will travel at speeds between 13-15.5 knots and it is capable of carrying 198 passengers. The ferry can also carry 31 cars or five trucks on its open deck. The vessel has the largest battery pack currently installed for maritime use and it is also the first electric ferry to have no emergency back-up generator on board.

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Credit: MTU

Robert Allan Ltd. and MTU Friedrichshafen GmbH recognized these new market opportunities, took action, and developed the first natural gas fuelled shallow draft pushboat design – the RApide 2800-G pushboat.

Asked to provide details on the most significant development for Torqeedo's product lines during this calendar year, Trkla explained, "During the past year, Torqeedo brought to market its award-winning Deep Blue 100i integrated inboard propulsion system, with a combination of new features not previously available, The new Deep Blue 100kW electric direct-drive motor has twice the output power of previous models, and is paired with a 40kWh BMWi3 automotive-style lithium ion battery hardened for marine use. The Dee Blue system is designed for super-fast recharging – up to 75 percent capacity in less than 1.5 hours."

Torqeedo's notable commercial marine projects and programs during the past year include:

- *A special high-thrust electric maneuvering system for Viking's new LifeCraft inflatable passenger evacuation system;*
- *The world's first electric-powered freefall lifeboat from Verhoef, tested and certified to meet all requirements;*
- *Thailand's first all-electric commuter ferry placed into service by the Bangkok Metropolitan Authority;*
- *The world's first solar-electric sewage pump-out boat for the Connecticut East Shore District Health Department;*
- *A fleet of historic passenger transport boats for an island resort off the coast of Germany;*
- *New rescue boat for the Swedish Sea Rescue Society, with twin Deep Blue inboards in parallel with diesel engines;*
- *A new passenger excursion boat in Paris; and*
- *Electric and hybrid propulsion for numerous autonomous robotic research craft for hydrographic, survey, surveillance and military applications.*

ROBERT ALLEN, MTU RECOGNIZE NEW MARKET

Robert Allan Ltd. and MTU Friedrichshafen GmbH this year recognized new market opportunities, took action, and developed the first natural gas fuelled shallow draft pushboat design – the RApide 2800-G pushboat.

This challenging project is a preliminary design, which utilized the proven shallow draft RApide 2800-Z2 pushboat that currently operates on the Amazon River system. The vessel design was modified to suit a complete LNG (liquefied natural gas) propulsion system with two 746 kW MTU 8V4000M55R-N Tier III gas safe main engines. Additional to the engines, MTU also acts as the system integrator, which means that MTU will also provide the complete LNG package – LNG tank system and

an integrated ship monitoring, LNG control and safety systems.

ULSTEIN VERFT AND WÄRTSILÄ REFIT

Acta Centaurus, a 93.4-meter offshore wind construction support delivered earlier this year by Norway's Ulstein Verft, is to be fitted with a Wärtsilä hybrid propulsion solution. The DP2 walk-to-work construction support vessel is owned by Netherlands-based Acta Marine and will gain fuel consumption and environmental benefits by being able to operate with fewer engines running and at a more optimized load.

The Wärtsilä solution includes the hybrid drive, the batteries, and an energy management system. Wärtsilä will also carry out the installation, testing and commissioning of the hybrid system, as well as upgrading the ship's existing onboard systems to make it suitable for hybrid drive.

"Hybrid propulsion is becoming an increasingly adopted trend for meeting the challenges faced by today's maritime industry. Wärtsilä has been a forerunner in developing the technology to make this both possible and feasible, and our track record in this field is already significant," says Joel Knif, General Manager, Marine Project Sales, and Wärtsilä Marine.

THE OXE 300HP TURBO DIESEL OUTBOARD

This BMW TwinPower Turbo Inline-6-Cylinder Diesel Engine with the lower unit required out of the box thinking. As Pim Polesie, the Chief Marketing Officer for Cimco explained, "The approach was to take advantage of the automotive diesel engine's inherent high performance, substantially increased life and substantially reduced operational cost and compliance with environmental laws and regulations and combine it into a more reliable drive train suitable for the commercial market."

"OXE's technology eliminates beveled gears and transfer shafts, the weakness found in other outboards and inboards. The commonly used dog clutch system used mainly on outboard systems has been substituted with more sophisticated electro hydraulically operated solution, located above the waterline," Mr. Polesie explained.

"The approach was to take advantage of the automotive diesel engine's inherent high performance, substantially increased life and substantially reduced operational cost and compliance with environmental laws and regulations and combine it into a more reliable drive train suitable for the commercial market."

– Pim Polesie,
Chief Marketing Officer for Cimco

"OXE's transmission drives a geared belt that turns the prop and allows for increased torque transfer to the propeller while it enables smaller torpedoes, and a slimmer submerged module. The gearbox and clutch system are continuously water-cooled which means that you can use the trolling function without time limit," said Robert Karlssen, Cimco test pilot and technician.

YANMAR'S D-TORQUE TURBO DIESEL OUTBOARD ENGINE

Yanmar says that the D-Torque turbo diesel sets a new benchmark in diesel practice. The 800cc, 50hp double cylinder design offers unrivaled flexibility. It delivers a remarkable 111Nm at 2,500 rpm; more than the best-performing 70-hp gasoline injection four-stroke gasoline outboard engines on the market today. The engine shows excellent fuel efficiency, on average less than 12 liters per hour with wide-open gas. The Dtorque is the ideal choice for operating or managing work vessels, safety / rescue boats, fishing boats, government and port authority ships, passenger boats or super yacht tenders.

Credit: Yanmar

Yanmar's D-Torque diesel's 800cc, 50hp double cylinder design offers unrivaled flexibility.

LOOKING AHEAD

As the New Year approaches, the so-called IMO 2020 deadlines are facing blue water operators. At the heart of that international mandate is the global effort to reduce emissions, especially from the transportation industries, in particular, waterborne commerce. On this side of the big pond, brown water operators face the same pressures, albeit in a different way; taking shape from the escalating EPA Tier requirements for marine engines.

Much of what has emanated from the brown water side of the equation therefore predictably takes the form of initiatives to increase fuel efficiency, reduce emissions and ultimately drive profitability in the sector. If so, then this year's propulsion advances represent some of the more important developments seen in some time, with more progress certain to come. The environment – and just as importantly – your bottom line are certain to be the chief beneficiaries.

Rick Eyerdam *is an award winning journalist and editor. Formerly, he was Editor of Florida Shipper Magazine. Additionally, he was Executive Director of the Miami River Marine Group and Captain of the Port of the Miami River. He is a graduate of Florida State University with majors in English and Government. His articles have appeared in myriad shipping magazines and newspapers since 1970.*

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All stats from 01/23/2019

Test Ride: Volvo Penta's Next-Gen Propulsion Tech

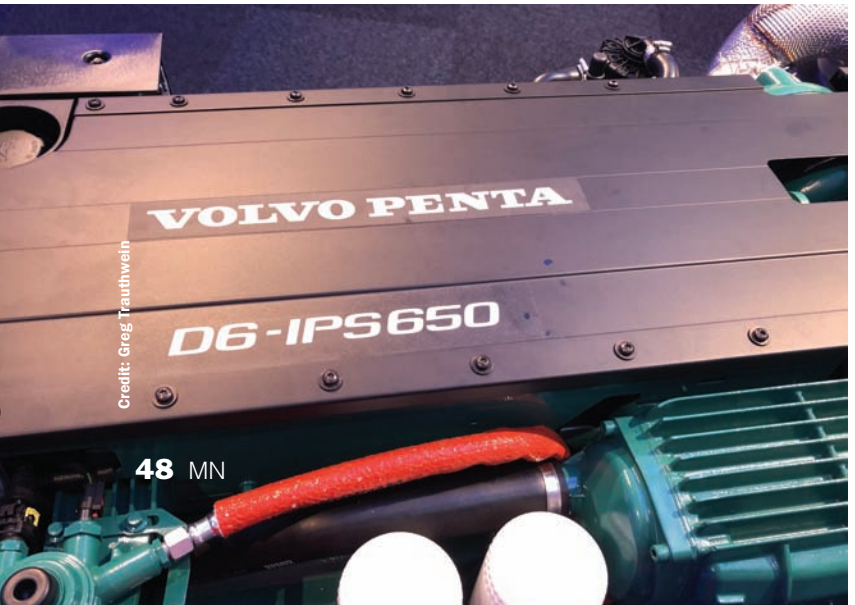
*Earlier this year, Volvo Penta opened the doors at its global R&D and testing center to **MarineNews**. A test drive of the organization's latest marine propulsion technology – from self-docking yachts to all-electric ferries to new engines, drives and controls – revealed impressive equipment, with all indicators pointing toward an automated, connected and electric future.*

By Greg Trauthwein

Innovation in the maritime propulsion sector has evolved quickly, driven by new regulations aimed to dramatically cut greenhouse gas emissions from marine vessels. Volvo Penta has been a driver in this regard, able to use the heft of its global manufacturing organization which serves multiple transport markets.

"The discussion really starts with the Volvo Group which develops trucks, construction equipment, busses and marine equipment as well," said Johan Inden, President, Region Europe, and head of the Volvo Penta's global marine segment. "What we see as the macro driver are cities becoming more densely populated, and many of these cities are situated along major waterways. With this comes significant investment in their logistics systems. We're working with several cities, including Gothenburg (where we're from) looking at building a multi-modal transport system of electric platforms: electric busses, electric refuse trucks and, of course, electric vessels on the waterways with Volvo Penta's electric propulsion system. That's the macro driver: cities are looking at their infrastructure and starting to make investments."

To this end, as a part of Gothenburg's ElectriCity project, Volvo Penta partnered with ferry operator, Styrsöbolaget to introduce electric propulsion to an existing ferry that will link both sides of the Göta Älv River. The ferry – Älvsnabben 4 – will be converted into an electric pro-



Credit: Greg Trauthwein

pulsion vessel with the refit scheduled to begin in early 2020. To start the process, Volvo Penta fitted the electric technology into its own test boat to evaluate. The test vessel – known as PTA81 – may be slightly smaller than the ferry, but it has the same batteries, controllers and electric motors that will be used on the Älvsnabben 4. The technology being tested is not just applicable for ferry operations, it will be relevant for most marine electromobility applications, and has been proven elsewhere in the Volvo Group.

"In terms of electrification, waterway transport in big cities – whether it's goods, whether it's passengers – lends itself well to electrification, where there is a predictability, a clear picture of the energy required and infrastructure for charging stations," said Inden. "So the area that we see moving forward at the fastest pace for full electrification is passenger transportation on city waterways. When you move to hybridization, you widen the business case where you combine a traditional propulsion system with an electric system."

"Our investment into the R&D that goes into this electric propulsion is growing. I think it's important to realize though, while we speak more about electrification, there are many different ways of becoming more sustainable and investing toward the future," said Inden. "It's everything including the fact that all of our marine engines are classified for HVO, synthetic diesel that allows you to reduce your carbon footprint by up to 90% approximately just by using a different fuel. That, combined with electrification, means that we're investing in several different technologies to build a platform that is available both today and in the long-term."

Welcome to Krossholmen

While there is ample 'big picture' trend talk regarding emission reduc-

"In terms of electrification, waterway transport in big cities – whether it's goods, whether it's passengers – lends itself well to electrification, where there is a predictability, a clear picture of the energy required and infrastructure for charging stations. So the area that we see moving forward at the fastest pace for full electrification is passenger transportation on city waterways. When you move to hybridization, you widen the business case where you combine a traditional propulsion system with an electric system."

– Johan Inden, President, Region Europe, and head of the Volvo Penta's global marine segment

Credit: Greg Trauthwein

tion, it all starts with the machinery and its performance, and the performance of the Volvo Penta equipment was clearly the star of the company's show at the its global R&D and testing center – Krossholmen – earlier this year. In a word the performance was 'superb' as tested.

"At Krosholmen we launched the D4 and D6 range targeting the commercial maritime and the leisure market. We followed up at Norshipping with an upgrade or our D8 engine with a new marine rating and the introduction of the new IMO aftertreatment for the D8 (already available on the D13)," said Inden.

Available from 150 to 480 hp Volvo Penta´s D4 and D6 marine engines received a full overhaul and update to deliver a 'hat-trick' for vessel owners; more power, better reliability and lower cost of ownership. The re-engineering of the D4 and D6 engines are far more than skin deep, as the company 'looked at the system from the propeller to the antenna,' said Volvo Penta's Johan Wästeräng, with more than 300,000 engineering hours and more than 40,000 test hours dedicated to the project.

The new IMO Tier III D8 engine

Credit: Volvo Penta

And the company has a solid installed base on which to draw performance guidance, with more than 100,000 D4 and D6 units already powering boats worldwide. The 3.7-liter D4 and the 5.5-liter D6 engines are designed and built solely for marine purposes, and a large portion of the engines have been reengineered to deliver greater power and reliability. The upgrade list is long, including a new engine management system, anew fuel injection system, a new turbocharger and a new supercharger. In addition, the cylinder head, pistons, and valves are reengineered to

withstand higher torque.

The engineering modifications include new materials. For example, the cylinder head, piston and crankshaft are all stronger by design and new materials have been introduced such as a Diamond Like Carbon (DLC) coating on the piston pin to reduce friction and increase durability. The common rail fuel injection system now features higher pressure – 2,000 bar. Controlled by a new Engine Management System, this enables more precise calibration of parameters controlling the injection, so the engines run even smoother and are more fuel efficient. In top spec, the D4 now has a maximum output of 320 hp, while the D6 in top spec boasts 480 hp, offering 10% more power across the range while simultaneously delivering 1% to 7% better fuel economy.

The IMO Tier III D8

Volvo Penta also unveiled the D8 engine and after treatment system to meet IMO Tier III, a regulation which stipulates a reduction in nitrogen oxides (NOx) emitted of around 75 percent compared to current IMO Tier II levels. The new emissions restrictions for vessels entering the Baltic Sea and North Sea will be implemented in 2021.

The D8 will be certified to comply with these newest IMO III emission regulations, as well as international emissions standards – US EPA Tier 3, China 1 & 2, and NRMM IWW Stage V. The product will be released in two steps: the first release will be IMO II, EPA, and China legislations and – in mid-2020 – the second release will result in compliance with IMO III and European inland waterways regulations. The D8 inherits its IMO III technology from the D13. Volvo Penta initially launched its IMO III solution for its 13-liter models, and subsequently made it available for a host of marine propulsion and genset applications. The D8 engine offers a power output up to 313kW for inboard and auxiliary applications, and up to 265kW when used as a genset. In both roles, the reduction in NOx will go from currently permitted levels of 7.7 g/kWh down to 2 g/kWh.

The D8 was first introduced in

As part of Gothenburg's ElectriCity project, Volvo Penta has partnered with ferry operator Styrsöbolaget to introduce electric propulsion to an existing ferry. Before this can become a reality, the company has fitted the electric technology into its own test boat to evaluate the tech. Pictured is PTA81, the test vessel fitted with the electromobility system ahead of the Älvsnabben 4 ferry re-build.

2016 for marine high performance and leisure applications. This was followed by a new variant that boasted a 3-4 rating, making it suitable for commercial Light duty, planing and semi-planing boats. The Volvo Penta D8 MH is an in-line 6-cylinder, 7.7-liter diesel engine with common-rail fuel injection, double overhead camshafts and twin-entry turbo, featuring a rigid cast-iron cylinder block and cylinder head.

As a genset the D8 comes complete with engine, generator and monitoring system, all tested and ready for installation onboard. D8 based gensets will deliver power in 50 Hz and 60 Hz in a range from 136kWe to 250 kWe and come with major classification society approvals.

The D8 engine combined with Stamford generators create a genset portfolio tailor-made to auxiliary power generation. This engine is also powerful enough to be the base power provider in compact diesel-electric and serial hybrid propulsion systems.

Next generation power generation is indeed here. Here, and across the big pond, Volvo Penta is at the heart of it all. That's true today, and for tomorrow, as well.

From Estonia with Love

Lyman-Morse Boatbuilding, the classic Maine boat designer and builder will build to Baltic Workboats design for the domestic workboat market.

By Rick Eyerdam

Lyman-Morse Boatbuilding, the classic Maine boat designer and builder will announce at this year's International WorkBoat Show that it has entered into the domestic workboat market as the Jones Act builder for the Estonian, Baltic Workboats wave piercing pilot boat, currently popular with Danish and Belgian pilots.

How do you feel about taking on something as unusual as building a pilot boat designed and built in Estonia, we asked Drew Lyman, President of Lyman-Morse boat works? "It is pretty exciting venture for us. It really diversifies us into this commercial world more so than we have been in the past," Lyman replied, adding, "We had done some a couple years ago but nothing ever came of it; it wasn't the right set up for us. This set up with Baltic is going to be pretty advantageous. I think for both of us."

And Estonia?

"We just got back from the yard over there and the outfit is top notch. And so that is always the question mark when you consider these things; what the support looks like," Lyman replied.

"And I was really surprised with what I saw over there. I told the owners of Baltic you never know, you never know where Estonia is," he said with a laugh. "Then you get over there and you are like wow! I mean if that yard were in the U.S it would be blowing people away right now. They have a ton of work in Europe and it is a couple of younger guys that own it. It is pretty cool."

Estonia actually

Estonia is in Northern Europe where it borders the Baltic Sea and Gulf of Finland. It includes more than 1,500 islands, one of which is Saaremaa, home to Baltic Boat Works' state-of the-art indoor production facility. It is renowned for its shipbuilding heritage over many thousands of years.

Formerly part of the Soviet Union, Estonia is dotted with castles, churches and hilltop fortresses. Its currency is the euro. It is rated highest in the world for political freedom, tenth in press freedom and third in literacy at 99 percent. Also of note, Estonia is also said to be one of the world's most advanced digital societies. Looking ahead for the complicated world of workboats, that just might be important.

And the boat?

"Our design, engineering and construction teams are delivering workboats with proven designs around the world.

"It is pretty exciting venture for us. It really diversifies us into this commercial world more so than we have been in the past. We had done some a couple years ago but nothing ever came of it; it wasn't the right set up for us. This set up with Baltic is going to be pretty advantageous. I think for both of us."

– Drew Lyman, President of Lyman-Morse Boatbuilding

These vessels fulfill customer's needs, providing them an even safer, more efficient and environmentally friendly product – a workboat that just performs in many sea conditions. They work because they've been built, they've been tested, and they've proved they're seaworthy performance in real-life situations. We've taken a new approach to the workboat industry. Baltic Workboats wave-piercing technology is making a significant difference, providing unrivaled sea keeping in high seas and reliability that is unmatched," says Margus Vanaselja, CEO of Baltic.

"I have driven the boat and it is a wonderful machine and higher end than I ever expected a pilot boat to be, said Lyman, adding, "The Baltic guys really solidified this new hull form, it's a revolutionary new design and the engineering behind it is impressive."

"They have spent a lot of time and resources into the hull form. And they have a whole tank testing system right next to the boat yard, so they have really proven this out through engineering."

Port Everglades' new pilot boat

Carl Mahler is the man who brought the Baltic Workboats pilot boat to Lyman-Morse, but only after he convinced the Pilot Association of Port Everglades to buy one.

He explains, "I am a pilot at Port Everglades. Three years ago, we decided we need to replace one of our 30 year old Bill Preston designed pilot boats. As a naval architect and marine engineer, the pilots put me in charge of looking for our next pilot vessel. I reviewed a lot of other vessels and was amazed at the promises they made for this wave piercing pilot boat from Estonia, of all places. The claims that were made about the efficiency of their proprietary wave piecing hull and the relative comfort in a rough sea caught my eye."

Indeed, Mahler liked it so much that he joined the company as head of sales for the United States two years ago. Notably, the Port Everglades Pilots just celebrated two years of service from the Baltic Pilot, the Pilot No. 7. Mahler gushes, "It is fast, safe, fuel-efficient and a very comfortable ride. Everyone loves it."

In a nutshell, the wave-piercing bow design provides a longer waterline length when compared to a traditional hull vessel. In rough sea conditions, when the bow becomes submerged, the top surface of the bow creates increased down force, which compensates for the buoyancy of the bow.

The bow design reduces pitching motions and provides a smoother ride for Captain and crew at all speeds. When compared to a traditional hull, a wave-piercing hull design provides 40% less vertical acceleration and up to a

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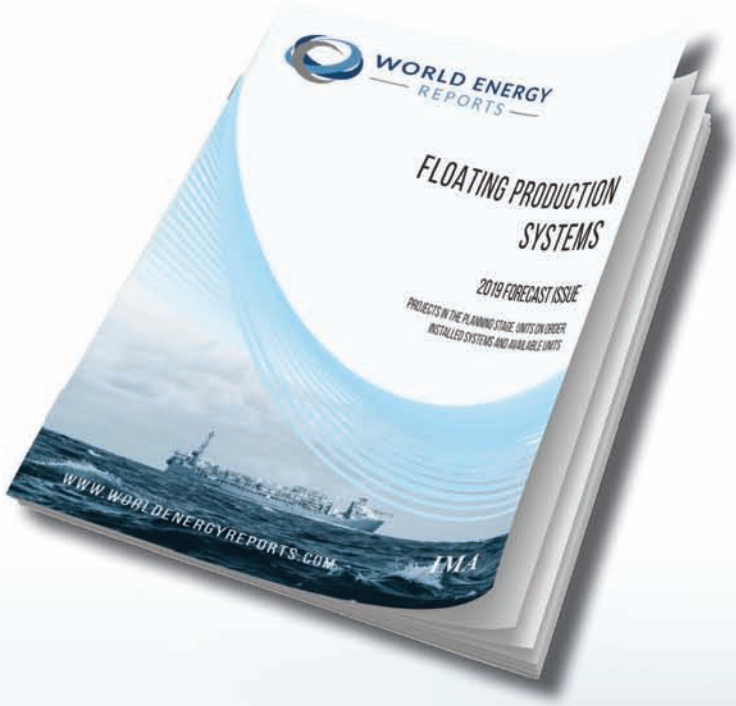

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Mahler told ***MarineNews*** that the Baltic Workboats wave-piercing series hull design has been thoroughly tested in rough sea conditions to deliver exceptional performance and helm control in the most challenging marine environments. The wave-piercing bow is deep and slender for high speeds and fuel efficiency. The maneuverability of the WP-Series is among the best available in a workboat hull being able to turn completely around 180-degrees in just four boat lengths at high speeds.

Along the way, Baltic Workboats developed a unique wheelhouse that has created a safe working environment both in the cabin and for the crew on the deck. The wheelhouse offers nearly 360-degree visibility and was developed in collaboration with leading nautical experts from Estonia, Belgium, Sweden, Germany and the United Kingdom. The captain has a center position with uninterrupted views of the deck and boarding areas with additional skylight windows. Moreover, all Baltic Workboats wheelhouse designs are securely mounted to withstand hard impacts or collision ensuring the safety of the captain and crew.

Beyond the advanced wave-piercing and self-righting capabilities of a Baltic Workboats US vessel, its innovative design keeps the deck and cabin virtually vibration and noise-free. By resiliently mounting the wheelhouse, the design delivers smooth, whisper quiet operation as low as 63 decibels (less than a car on the highway) and is available for sea trials in Florida.

Domestic Boatbuilding: Transition by 'Design'

Asked if the Estonian computer design specifications would translate to his shop, Lyman said, "That's the beauty of the yacht industry, especially when you go into these upper end commercial boats. We are fully vested in the same computer programs, so the transition is going to be relatively seamless. And the other side is that they have 30 plus engineers and designers on staff. So, with their team and our team, we have a pretty good design office as well."

This isn't Lyman-Morse's first rodeo. Over the past 40 years, Lyman-Morse Boatbuilding Co. has built more than 110 yachts, each of them unique in its own way. Lyman-Morse

Fabrication's already capable metal shop is being upgraded to handle the Baltic pilot boat fabrication. And, of course, Lyman-Morse will also custom build pilot boat interiors for the Baltic pilot boat hulls, Mahler said.

"I think once we have put the word out in New Orleans, I think we will feed into other areas. Once people hear about what we are doing, our quality will speak for itself," Lyman said.

Proven Design for a Proven Business Model

This also isn't the first time an international design has made its way into U.S. yards. The most familiar manifestation of that trend (perhaps) was Damen's decision to sell its designs into the Jones Act, domestic markets. Separately, Blount Boats made history when it delivered the Atlantic Pioneer, America's first U.S. Flagged Crew Transfer Vessel (CTV). That 21 meter aluminum vessel was designed by South Boats IOW (Isle of Wight). And, not to be forgotten, way out on the left coast, All American Marine attained exclusive North American building rights with one of the world's top naval architects and designers – Nic de Waal of Teknicraft Design, Ltd. in Auckland, New Zealand – and has successfully delivered customized versions of those designs many times.

Baltic Workboats, already having delivered one workboat into the U.S. market, now intends to introduce – and build – their designs in the colonies, as well. "And once people see that and feel that quality in conjunction with a great design and great boat yard over in Estonia, long-term, I think this can be very successful," said Lyman, adding, "Outside of the pilot boats, this could mean fireboats, Coast Guard projects, and other types of workboats. We will see how that fits within the system of creativity." No doubt, very well indeed.

Rick Eyerdam is an award winning journalist and editor. Formerly, he was Editor of Florida Shipper Magazine. Additionally, he was Executive Director of the Miami River Marine Group and Captain of the Port of the Miami River. He is a graduate of Florida State University with majors in English and Government. His articles have appeared in myriad shipping magazines and newspapers since 1970.

Subchapter M: One Year In

Industry SME (Captain) Pat Folan weighs in from the front lines.



**All images: Pat Folan*

It has been an interesting year for towing industry. As the new Subchapter M towboat rule rolled out, it didn't take long to discover that the regulation wasn't perfect. As stakeholders look ahead to what comes next, it is also helpful to take a look back at what went right, what didn't, and more importantly – why.

THE U.S. COAST GUARD

The US Coast Guard does not have the manpower to add more than 5,000 vessels to its workload. Compounding this reality, various sectors are advocating for the 'USCG Option.' One East Coast sector sent people to industry days and the message was that towing vessel operators did not need anyone beyond the Coast Guard to get them through SubM. Then transfer season hit and six vessels that we had up for a COI in June still have not even been contacted. Across the country, another 48 vessels were up for COI in year one, and only 26 have been through the process.

When we began the COI application process for our customers, one sector asked us for so much information that the packet had to be broken into 15 parts to be e-mailed. We eventually got the submission size down, but it is still a lot of information for a TSMS submission.

In practice, Coast Guard inspectors have routinely questioned everything that Third Party Organizations (TPO) did in their audits. If there is a system in place to use third party organizations, then the USCG should trust the TPOs – especially if they do not have the manpower to do the job. Are the IACS classification societies performing blue water COI's and TVE's being scrutinized to the same degree? If not, why not?

Variations of our Towing Safety Management Systems (TSMS) have been through 29 TPO audits in the past year with three different TPOs and multiple auditors. It's also true that new Ensigns have to learn somewhere, but a better way might be to spend some time on a boat and not e-mail industry repeatedly for obscure and sometimes inane information.

Why would the USCG schedule the 'COI drop dead' date in their transfer season? If all inspectors were equal, it would still be a big learning curve for the incoming people to get up to speed on towing vessel COIs. But, all inspectors are not equal. Some delays can certainly be attributed to the dedicated U.S. Guard men and women trying to learn not only their new jobs, but also a new industry. Those delays will have a huge ripple effect. If only 16% of towing vessels have COI's three months after the due date, what happens as this year rolls along?

Probably the most frustrating part of this process is the inconsistency from Coast Guard districts and even sector to sector within districts. A common lament is that although Coast Guard regulators may not have to completely understand the businesses of those that they regulate, they should at least try. After being told repeatedly that I didn't understand the sea conditions off New England and the effects on towing vessels, I gave up trying to explain that I ran tugs (and owned one) for decades on the New England coastline. Industry's input doesn't seem to matter. In one case, we had to argue why the doubler was under a stern roller and why it needed to be there. If an aluminum

"If there is a system in place to use third party organizations, then the USCG should trust the TPOs – especially if they do not have the manpower to do the job. Are the IACS classification societies performing blue water COI's and TVE's being scrutinized to the same degree? If not, why not?"

paint locker meets everything in an MSIB from one sector, then why is it completely unacceptable in another sector within the same district?

The USCG issued CVC-FM-004(2) to capture data from towing vessels. But one sector decided they would create their own and it includes nuclear, sail and oar powered propulsion. They refused to accept the Vessel Particulars Form. To this end, and in three different sectors, inspectors have come aboard with blank sheets of paper and then, they wing it. Don't ask the operators to use TugSafe and then not use it to inspect the vessels.

The Coast Guard's Towing Vessel National Center of Expertise (TVNCOE) has evolved into to be a good resource but unfortunately, they don't have any real power. They defer to the OCMIs, who are typically not experts in the areas that they work. They transfer around too much to be experts.

The interpretation of Manning requirements has been another headache. For example, three almost identical tugs, operating in three different districts, all want Oceans International certification. District Z mandates 10 men, District Y, 8 men and District X says 4 men. Up until the COI, all were operating with 4 men safely. Some districts say two men per 12-hour watch for Lakes Bays and Sounds, but some want three. To be sure, there is a manning table in the Marine Safety Manual, but once again, the OCMI gets to interpret it.

THE TPOS

Just like industry and the U.S. Coast Guard itself, the TPOs have grown a lot. And it hasn't been easy. What they thought would be acceptable formats for receiving and sending information to the USCG, turned out to be wrong. Like the USCG, the TPOs are trying to be black and white in a grey Sub M world. It's a shame the USCG hasn't turned out to be a better partner.

We have worked with four of the TPOs and have had favorable experiences with each. The range of auditor experiences has been good and the underlying sentiment of helping companies comply while being objective is a breath of fresh air, as compared to the Coast Guard option.

INDUSTRY

The biggest surprise (for me) has been the number of companies that were not aware of SubM or thought it didn't apply to them. Subchapter M has been in every industry publication for a decade. Yet we still find companies that haven't even contacted the Coast Guard about their COI.

A big problem with industry is their fear of the Coast Guard. Even when the owner is on solid ground, they won't push back. In private, they all understand that the Coast Guard works for us all, funded by tax dollars. The reality for small operators is that Coast Guard inspectors can and will shut them down.

In more than one case, no rails on the sides of the main

deck house have resulted in 835's. The boats have bulwarks. We were told that [144.810] required the installation of rails. True; it does – but only for vessels in oceans or coastwise service. Rather than allow us to push back, the operators installed the rails because they felt if you prove your point, the inspector will just find something else that is probably more expensive to install. The rails are a good idea, but should not be at the discretion of the inspector.

To be fair, we have a few operators that are not really living the TSMS and they look at the Health and Safety Plan as something that they trot out for the inspection. No matter which option that you use, you must understand and work to continually improve your system and your company. This is not just a management issue. Towboat captains have improved, but the revolving door for deckhands in the industry will continue to present challenges. One problem is wages. Industry needs to sell this as a career and get the people to take pride in what they do. In reality, that is a far bigger societal issue that can't be covered here.

Many companies have rolled the dice and decided to wait until the Coast Guard shuts them down rather

than spend the money ahead of time to comply. That's not the Coast Guard's fault. It's also not their fault if an operator decides to run substandard equipment with substandard employees. The Coast Guard has a job to do and although I am frustrated with their performance in certain areas, overall, they are trying very hard to get it right. They are undermanned, underfunded and immediately the attention of your ire. I would not want to do their job for even a day.

WHAT'S NEXT?

For all sides of the equation – TPO's, the Coast Guard, and industry itself, learning the law is a duty shared equally by all sides in this partnership. For the Coast Guard, this means knowing that the towing vessels are not T-Boats; for the TPO's, it means understanding that towing vessels are not deepsea ships; and for industry itself? Know that your vessels are now inspected.

Subchapter M was created to enhance and improve mariner safety. Most stakeholders don't like forms and training. Most boat captains just want to run the boat. What they share in common is that they all want to go home safely at the end of each work period. On board, it means learning the TSMS/Health & Safety Plan and then, to become better, safer mariners. For the office, learn that the mariner's safety is your responsibility. Finally and possibly most importantly, learn to get along with each other. We must build trust and that means listening. We can all learn something from each other.

LOBBYING (FOR CHANGE)

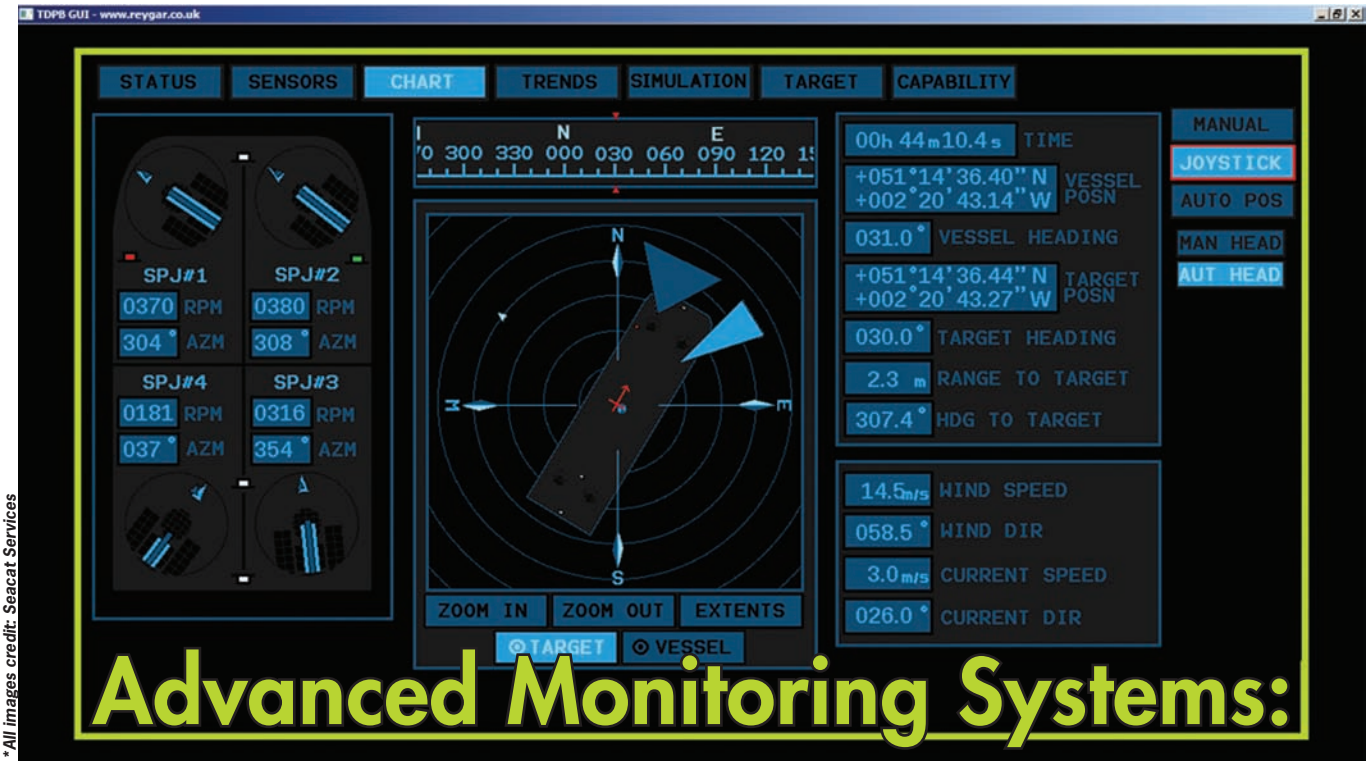
The Towing Safety Advisory Council (TSAC) – a committee that provides for the Federal government to seek the advice of citizens on a range of issues affecting its policies and programs – was set to take up a review, but the September meeting was cancelled, and reportedly, TSAC's charter wasn't renewed. We need TSAC back. Ultimately, this helps everyone to figure out this new law.

Taking it a step further, it might be worth considering (for all inspected vessels, not just towing vessels) the transfer of commercial vessel oversight by civilians. Subchapter

M should be aligned with other laws governing inspected vessels. To be sure; at TBS we are lucky: we deal with towing vessels. On the other hand, a Coast Guard inspector might board a towing vessel in the morning, attend a charter boat in the afternoon, a tank barge after that and then a ship. If they don't always get it right, it isn't hard to see why.

A few months into year number two of SubM, it is clear that the new rule is imperfect. It took the Coast Guard four years after the NPRM came out to publish the final rule and it still isn't right. All that said; it is fair to ask, especially in the absence of TSAC, what happens now?

Pat Folan is a partner in Tug & Barge Solutions and has operated towing vessels from Maine to Corpus Christi, TX, including the Alabama Rivers, Lower Mississippi, Great Lakes and Erie Canal. Tug & Barge Solutions exists to help companies and mariners adapt and then grow with SubM. The opinions in this article are his alone and may not reflect the views of MarineNews, its editors and/or publisher. Reach Captain Folan at pat@tugandbargesolutions.com



*All images credit: Seacat Services

Advanced Monitoring Systems:

The key to success in the rapidly emerging domestic offshore wind sector.

By Chris Huxley-Reynard, Managing Director of Reygar Ltd.

Despite an increase in the digitization of operating practices throughout the maritime sector, advanced monitoring has seen limited uptake in the U.S. by operators of smaller vessels such as workboats, with investment typically focused on the larger end of the market. However, as the domestic offshore wind market expands, local operators logically will respond to the demands of project owners whose standards and SOP have long been established in the European sector.

Monitoring operational and performance data are a key aspect of offshore wind project owners' expectations, and a willingness to supply this data has proved a strong influence on procurement decisions in Europe as wind farm owners look to increase "time on turbine" for their technicians. Fortunately, the development of new, cost-effective platforms that are integrated into existing vessel systems has removed the barrier to entry for smaller vessels looking to take advantage of the commercial and operational benefits of advanced monitoring.

The emerging US offshore wind market

As the offshore wind industry becomes increasingly global, it will prove vital for the high operational standards established in the mature European market to be shared around the world.

Increasingly, European vessel operators are adopting cost-effective advanced monitoring systems that plug directly into on-board sensors and equipment, providing the kinds of insight into vessel operations and safety that they know will help them to meet the KPIs stipulated by project owners. Importantly, vessel operators can use their monitoring systems as hard evidence to demonstrate this to their clients – vital when negotiating for long term contracts.

Adopting advanced vessel monitoring practices will see domestic Jones Act operators capitalize on the lessons learned via hard experience by established players in the European market. Vessel operators who take the initiative to push for these standards as the industry emerges stateside will arguably find themselves at a commercial advantage as project owners look to confirm their vessel support services. Moreover, and critically important for operators of smaller, multi-mission workboats, this can now be done cost-effectively across the entire fleet, and in a way easily scalable as the U.S. market evolves.

Advanced monitoring will therefore allow forward-thinking companies to get the most out of their fleet, drive operational improvements and support commercial advancement in this emerging market.

Cut downtime through preventative maintenance

Monitoring engines and other critical equipment enables the crew and the vessel operations team to take remedial action before equipment suffers catastrophic failure. This offers many logistical benefits. For example, operators can minimize the level of damage caused by equipment breakdown, and gain the foresight to group maintenance activities into periods of scheduled downtime - maximizing vessel availability.

Seacat Services, a UK-based CTV operator, prioritizes an in-depth understanding of the health and performance of its assets as a way of maximizing vessel availability and ensuring the safety of technicians and crew. When Seacat installed Reygar's cutting-edge BareFLEET advanced monitoring system across its fleet of 14 vessels, it also empowered crews and operations staff to respond to crucial vessel data – while also gaining feedback on their own performance.

Ian Baylis, Managing Director of Seacat Services, explains how BareFLEET processes intangible data to generate concrete, operational results: "There are 440 alarms connected to each engine. For 20 of these, the alarm is a signal for us not to start the engine. These alerts go straight to vessel managers' mobile phones so that checks can be carried out before the vessel leaves the harbor – and, crucially, this enables us to act before a fault becomes critical and results in unscheduled downtime."

Ultimately, Seacat's decision to install Reygar's cost-effective monitoring system optimizes the availability of the entire fleet. "The system paid for itself within the first few months. For modern CTV operators seeking to make use of the latest advancements in digital vessel monitoring systems, BareFLEET is indispensable," said Baylis.

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– Ian Baylis, Managing Director of Seacat Services

Amplify vessel and crew performance

The data collected by BareFLEET also allows Seacat to ensure that best practices are consistently applied by the firm's mariner. Baylis added, "We look at trends in engine revolutions and assess masters' performance. That means we can identify gaps and use this to advise crew training."

Ultimately, improving performance out at sea leads to significant cost savings during operations. Crucially, understanding the relationship between sea conditions, weather, and fuel burn allows customers to be proactive in improving the fuel economy of our vessels in any context.

Beyond this, Baylis insists, "Not only does this have positive implications for the bottom line, it also contributes to reducing the impact of our fleet on the environment. BareFLEET provides the data that guides our crews in identifying optimal speeds for the conditions, improving crew comfort and cost-effectiveness."

Reduce sickness to optimize "time on turbine"

Comprehensive monitoring of CTVs also has implications for health and safety, ensuring technicians are fit to work and "time on turbine" is optimized. Specifically, the effective monitoring of critical equipment, vessel motion, weather and sea conditions is essential for ensuring successful personnel transfers and reduced sickness.

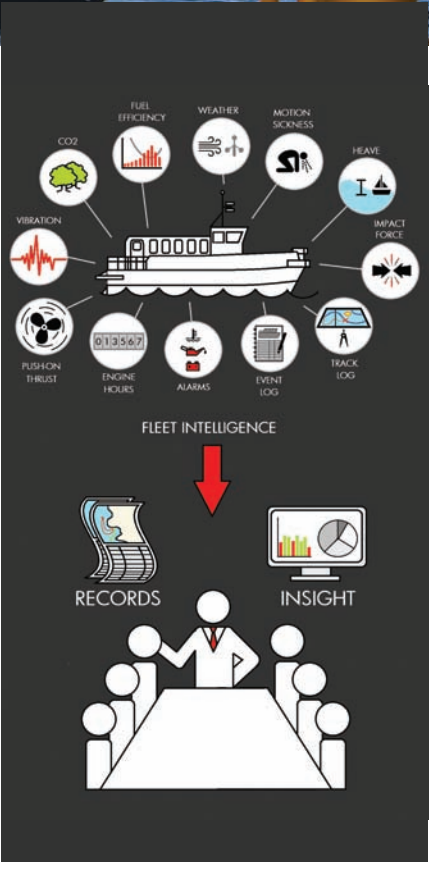
This is especially important with sea conditions subject to change at short notice. Motion sensors guide the crew to adjust their vessels to reduce pitch and roll, meaning that when technicians arrive at the turbine they are fit to carry out their responsibilities at full capacity.

Data sourced by monitoring the impact of the vessel onto the base of each turbine is another key metric which crews and operations teams can use to assess the safety and success of each personnel transfer. Bow slippage data from BareFLEET provides unparalleled insight into the safety of technicians during the critical stage of personnel transfer, even in adverse weather conditions.

"Operating at sea is inherently hazardous," adds Mr. Baylis, "But by adhering to vessel monitoring best practices at all times, risks for our crews and other personnel can be minimized. It is the responsibility of vessel operators to ensure that their crews and technicians are as comfortable and well-informed about their operations as possible – particularly when expected to work across

a diverse range of wind farms, sea conditions and harbors. The more knowledge crews have about the environment they are working in and the capability of their vessel, the better the decisions that could impact the safety of the team will be."

In the competitive world of support vessel operation, establishing and maintaining a reputation for quality, safety, and availability is crucial to securing and retaining contracts. On this side of the big pond, and in the emerging offshore wind sector, companies that take the lead and adopt vessel monitoring best practices will eventually cut costs, ensure crew safety and maximize vessel availability – not to mention set operational standards in the market and secure work with established project owners moving over from Europe.



A Step Up in Safety

How NABRICO's FASST Winder Winch created a safer work environment.

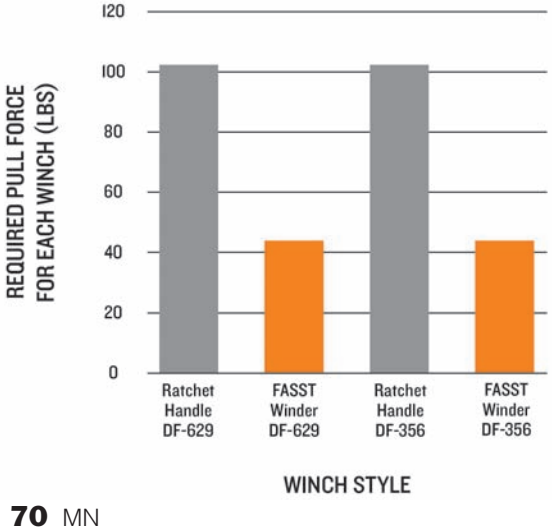
Great ideas can come anytime, from anyone. For NABRICO, a field team member's understanding of the physical exertion required to operate a ratchet handle, while also acknowledging the value in the older spoked hand wheel configuration, brought about both innovation and new standard of winch safety to the market in the form of the FASST Winder Winch.

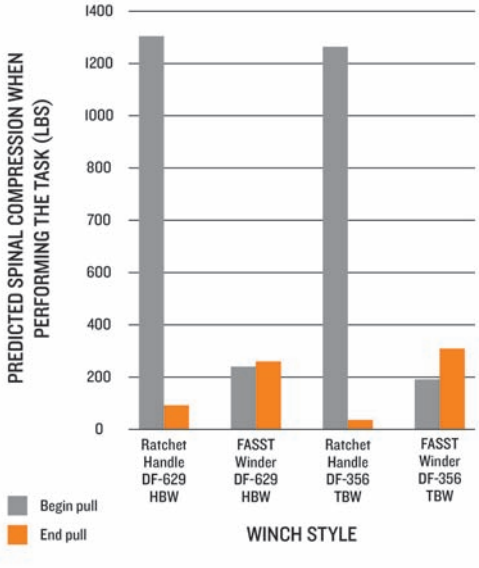
Maximizing Return on Energy

Rather than using a ratchet handle, which required more physical effort, the new winch incorporates a handle and foot pedal at the right location to maximize return on energy, harnessing the unused power of the operator's arms, legs and gravity. The result: a FASST Winder would take stress off the operator's back and shoulders by engaging the leg muscles in the process.

NABRICO discovered a core issue with the traditional ratchet winch. As winches are tightened, an operator's performance weakens over time due to natural fatigue. To solve for this, the new FASST Winder design allowed for a lower performance load (the amount of thought and strength required to safely perform a task) using gravity and the lever in the operator's favor. This drove performance to stay more consistent. When faced with the elements like heat or rain, the energy saved provided a safer, more productive work environment for the operator.

In fact, and according to one third-party report(*), the FASST Winder's new design allowed for over 50% reduction in force required to operate the winch.





Lower Stress = Reduced Accidents

Because of the FASST Winder's design requires less effort and engages other muscle groups, the winch allows for four times less back stress and reduces shoulder stress by half, compared to the ratchet model, according to a third-party report. In a nutshell, the FASST Winder's simple design reduces the risk of injury through key factors, as follows:

- *No Cheater Pipe or Extension Handle: Adequate cable tension can be generated with the FASST Winder with the newly designed handle and foot pedal, meaning no "Cheater Pipe," "Ratchet Handle Extension," or "Johnny Bar" is needed to create extra leverage.*
- *Four Points of Contact: The FASST Winder model winch can be operated with four points of contact – both hands on the handle, one foot on the barge surface, and one foot on the pedal.*

As the FASST Winder nears three years in the market, NABRICO has seen first-hand how this new design is improving the work environment for operators. NABRICO's Vice President and General Manager, Clint Bryan, recalls his most memorable sales call:

"We arrived at a customer's venue and showed the FASST system installed on a barge winch connected to another ratcheted barge winch. We had a small, skeptical crowd of four to five people. After a couple of minutes, many of them stepped away and got on their phones. The next thing you know, there are twenty people there and one of them was showing the winch off for us. We just stood there and watched; it was better than we had hoped for."

For NABRICO, innovation is driven by their entrepreneurial culture. A field team member's great idea transformed into a new product, increasing performance and creating a safer work environment.

BLOUNT BOATS:

Credit: Greg Trauthwein

Ferries, Offshore Wind Vessels Dominate Present, Future

***MarineNews** recently visited the Blount Boats facility in Warren, Rhode Island. While the year 2019 might be the 'year of the woman' in the eyes of the International Maritime Organization, the two women at the head of Blount Boats – Marcia & Julie Blount– have been a driving force in the U.S. boatbuilding market for decades. As Blount celebrates its 70th anniversary, read about the storied yard's promising future.*

By Greg Trauthwein

Founded in 1949, Blount Boats is a full-service with a customer base comprised of a variety of commercial and government entities including the U.S. Coast Guard, U.S. Army, and private and public vessel operators. Since its founding in 1949 by Luther Blount the company has designed, built and repaired hundreds of aluminum and steel vessels – up to 220 ft. in length – and today the company remains privately held and managed by Luther's daughters, Marcia and Julie Blount.

From its first boat built – a 77-ft. steel catamaran – to the variety of ferries, offshore wind support boats and ice-breaking tugboats being built today, Blount has progressively grown its capabilities and sought to squeeze the most out of its six-acre.

One of the most famous vessels built at the shipyard was a 130-ft., 600-passenger ferry boat. Built in 1952, this boat carried more than 60 million passengers from Manhattan to the Statue of Liberty for the Circle Line.

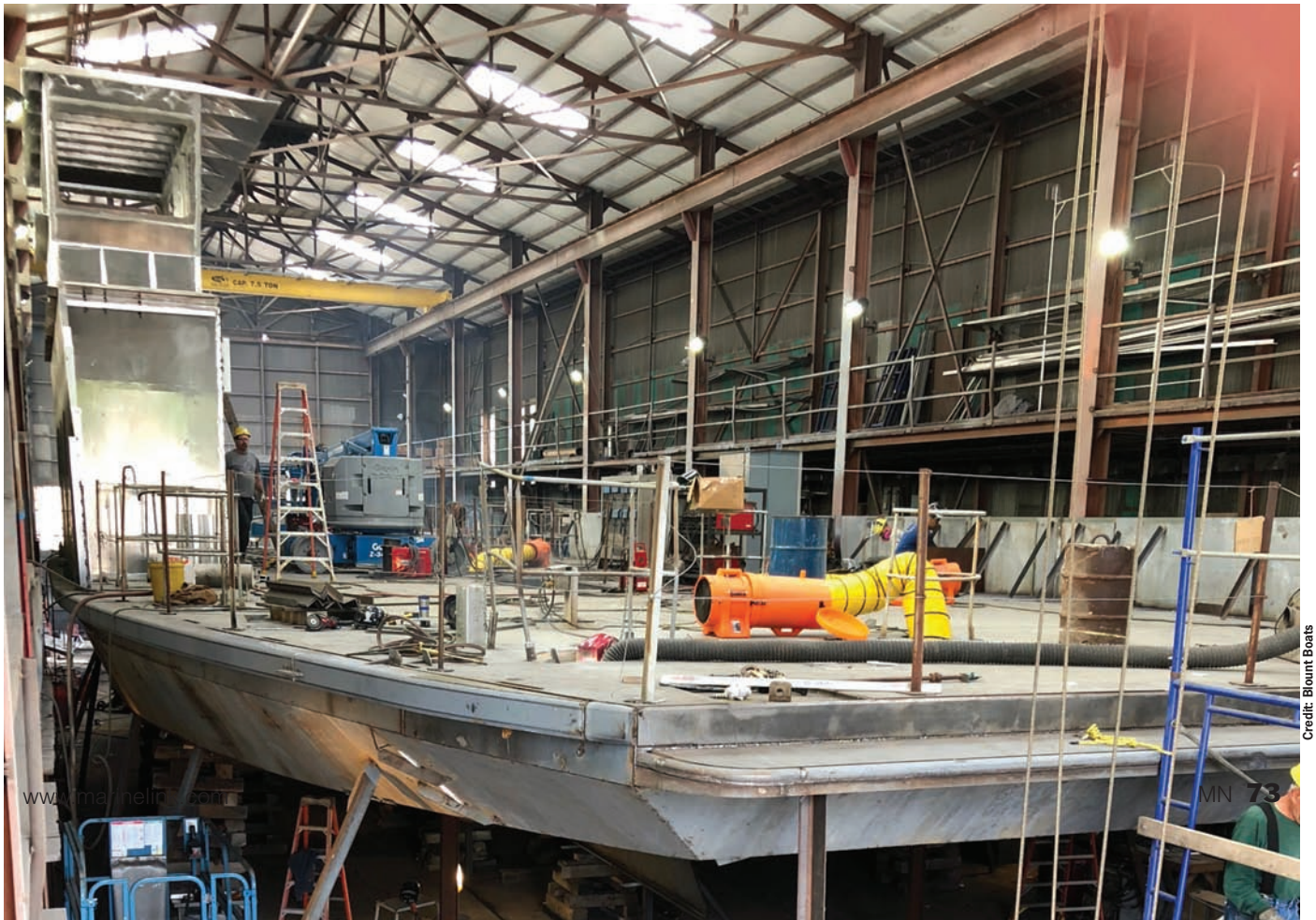
More recently, the construction and delivery of Atlantic Pioneer, the first U.S. Flagged crew transfer vessel for the Block Island Wind Farm. The boat is significant not only in being a 'first', but perhaps more importantly is signifies the boatyard's future as Marcia Blount, President of Blount Boats since 2007, said, when assessing future opportunities, that they are "blowing in the wind" as the offshore wind farm business continues to build in the Northeast U.S. Atlantic Ocean region. "This market has been off to a slow start but leases have been purchased and should develop into a robust market for a variety of vessels," said Blount.

Julie Blount [left] and Marcia Blount, President of Blount Boats

70 YEARS LATER ...

While 2019 has been an uneven year for many in the maritime industry, it has been "excellent" for Blount Boats according to Marcia Blount, premised on a healthy order book including four vessels being built during the 2019-2020 years, and a number of shipyard improvement projects currently underway, all designed to ensure the boatyard stays busy for years to come.

"Blount has contracts for four newbuilds which will be delivered in 2019 and 2020," said Marcia Blount. Delivered in May 2019 was the Governors 1 built for The Trust for Governors Island, a 132 x 40-ft. double-ended ferry that began service on June 15, 2019, and will serve 400 passengers per trip between lower Manhattan and Governor's Island.



Credit: Blount Boats

Blount Boats also completed an 85-ft., triple-screw aluminum ferry boat, Isle of Fire for Fire Island Ferries – the 10th vessel built for Fire Island Ferries by Blount Boats – that was delivered on June 19, 2019 and will service 386 passengers between Bay Shore and Fire Island on Great South Bay.

When ***MarineNews*** visited the yard in September, Blount was working another pair of vessels, including a 101 x 40-ft. steel double-ended passenger/vehicle ferry for Shelter Island, NY. To be named Southern Cross, it marks the third vessel built for South Ferry.

In addition, the shipyard is building a 56-foot ice-breaking, all-welded-steel, diesel powered, double crew tugboat to be named Breaker II for the New York Power Authority (NYPA). While small in size the boat is mighty in capability, "a little hulk" in Julie Blount's estimation, primarily tasked to tow an ice boom on the Niagara River to break ice floes before they go over the falls and pose a threat to NYPA's hydro power facilities. Designed by Bristol Harbor Group, the boat is significant as it is the first tugboat built by the boatyard in recent memory, and a specialized ice-breaking unit at that, which required some complex maneuvers for the yard in the shaping of the ¾ inch plate for the bow section.

Credit: Blount Boats

INVESTING FOR THE FUTURE

While any shipyard requires continual investment, Blount Boats has been particularly steady and progressive in this regard, touting the effectiveness of small shipyard grants from the U.S. Maritime Administration in helping it fund everything from new machinery to larger capital improvements, including a plan to expand and modernize its current facilities to include more building space under cover, and the addition of a marine travel lift to enable it to earn more vessel repair work.

"When the MARAD grants become available we always ask our foremen for their technical and equipment 'wish list,' covering equipment large and small to help the yard become more efficient," said Marcia Blount. The most recent round of grants, coupled with the nascent offshore wind industry and the potential large demand for new boat construction and repair, caused the Blounts to step back and evaluate how to best utilize their six acres. "Simply put, we asked ourselves how can we maximize our space to build and repair more boats."

"In years past you could build steel boats outside, and the ways was never covered," said Marcia Blount. "But for the new aluminum vessels (i.e. offshore wind farm vessels) we really need covered space. Our future is offshore wind and offshore wind farm support vessels, and we hope to be building and repairing many vessels in the future for the offshore wind sites."

Credit: Blount Boats

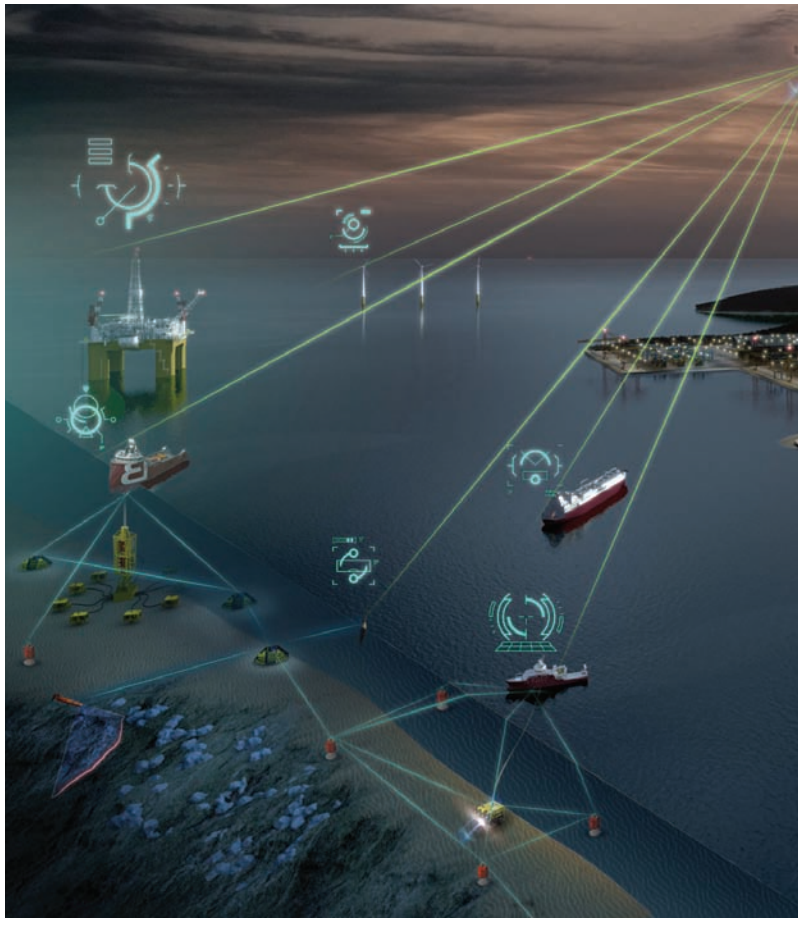

Investment in the yard. A new cement slipway for Blount Boats.

Credit: Greg Trauthwein

Digital developments continue apace in the workboat space

Sustainable, energy-efficient working practices and environmental regulatory compliance are among the hot-button topics driving the spread of maritime digitalization.

By Vigleik Takle, Senior Vice President – Maritime Digital Solutions – at Kongsberg



The benefits of a digital strategy for companies working within the maritime industry soon stack up. In addition to providing operational/logistical streamlining, data-based insights, a competitive edge and a reputational leg-up, connecting operational systems and consolidating interfaces also drives the levels of efficiency required for tangible environmental and financial sustainability.

Once the preserve of companies always expected to be on board for early adoption of new technologies, the ability to access and analyze vessel data using cloud-based solutions is now a realistic option for more commercial operators.

The recent signing of a Memorandum of Understanding (MoU) between KONGSBERG and MAN Energy Solutions, with the purpose of exploring the potential for collaboration on a common data infrastructure for the maritime sector reflects the fact that digitalization is now firmly in the maritime mainstream. The collaboration has been established to broaden the value offering to vessel operators, improve return on investment in digital solutions and increase the adoption of secure connectivity.

Under the MoU, MAN Energy Solutions is set to investigate the possibility of using Kongsberg Digital's data-infrastructure solution, Vessel Insight, to securely collect and transmit data using MAN Energy Solution's digital platform, MAN CEON. A successful trial would allow MAN Energy Solutions to use advanced services such as PrimeServ Assist, its remote monitoring and optimization package, to better serve customers.

The complexity of data capture and transfer drives up the cost of these essentially non-core activities and prevents efficient development of value adding solutions to the market. Collaboration between vendors in the industrial digital value chain is therefore a win-win for vendors, who can focus on digital development within their core competencies, and customers, who will get faster access to better and more cost-efficient solutions.

The collaboration between the industrial software company and the world-leading engine and marine solution provider aims to solve a key challenge for the broader adoption of digital solutions, namely the high cost of capturing quality data from the vessels, which leaves vessel owners and operators with an unattractive ROI on their digital investments. This could help accelerate the mari-

time transformation, where new technology and digital solutions enable a move towards smarter, more efficient, safer and greener operations.

From MAN's perspective, digitalization supports its commitment to help its customers increase the safety, reliability and predictability of their individual vessel performance and overall fleet. Through the cooperation with KONGSBERG, MAN aims to securely onboard customers faster to provide our new digital services, advanced analytics and support; areas in which it can provide unique benefits to their business. The company is also expecting faster development of its core functionality, supported by a stronger focus and customer interaction.

Maritime digitalization: fundamentals in practice

Clearly, the benefits outlined above all point to the three cost-reducing and business-enhancing fundamentals of maritime digitalization: asset lifecycle optimization, value chain transformation and operational excellence. The first of these simply equates to maximizing the profits achievable from a company's assets over their complete working

"... there are still maritime companies out there still working within a traditional framework of manual processes which are becoming less relevant, practicable and competitive with every passing day. As the industry moves inexorably towards integration and automation in everything from supply chains and logistics to vessel control and port operations, the need to adopt a considered long-term digital strategy becomes ever more pressing."

life, from planning and acquisition through to operation and maintenance (and, finally, disposal).

Value chain transformation, meanwhile, involves the integration of a company's financial and operational structures in order to strengthen and coordinate the overall corporate framework while achieving transparency between internal departments and third-party agents. In regard to operational excellence, this encourages firms to automate key processes from the ground up, starting with basic administrative functions – for example, installing analytical dashboards, moving from paper to digital logbooks – but potentially leading to increased autonomy in the operation of custom-designed, state-of-the-art vessels.

One example of the latter, an uncrewed and remotely-operated fireboat series design named RALamander, is currently under development by Vancouver-based naval architects and marine engineers Robert Allan Ltd in collaboration with Kongsberg Maritime. The thinking behind the fireboat's flexibly autonomous capabilities is simply to enable first responders to tackle hazardous port fires involving explosion risks or toxic smoke more rapidly and assertively than would previously have been possible, while the firefighters themselves can control operations via a remote console in conditions of total safety. The deployment of Kongsberg Maritime's low-latency, high-bandwidth control and communications system means that the semi-portable operator console can be located on a manned fireboat, tug or pilot boat as appropriate.

If the RALamander fireboat series represents digital technology's future potential, the fact remains that there are still maritime companies out there still working within a traditional framework of manual processes which are becoming less relevant, practicable and competitive with every passing day. As the industry moves inexorably towards integration and automation in everything from supply chains and logistics to vessel control and port operations, the need to adopt a considered long-term digital strategy becomes ever more pressing.

Integrated digital platforms

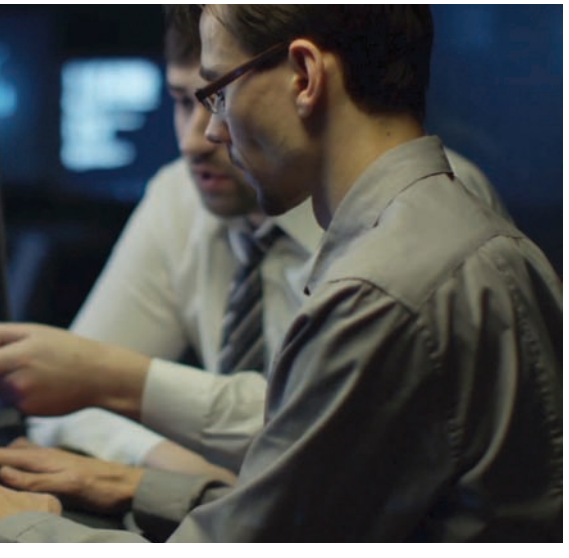
An admitted stumbling block for some is the perceived enormity and expense of collating, consolidating, encrypting, storing, sharing and leveraging all-important data streams from numerous different sources, all the while balancing transparency with confidentiality – and maintaining stringent cyber security protocols. The fear is that having to use a series of different applications to access data stored in multiple discrete databases would be time-consuming, costly, vulnerable and a hindrance to the provision of a joined-up view, with all the disadvantages for decision-making and profit margins that this would entail.

It might seem like the logical way to deal with these issues at a stroke is for companies to adopt an integrated digital platform which acts as a unified, central, single-

source library for digital applications. KONGSBERG's solution, however, is an open, collaborative, cloud-based ecosystem named Kognifai. Already eliciting positive feedback from early adopters and partner firms, the platform represents a cogent argument for the business potential of shared, integrated, open-source applications. It is in effect a digital marketplace and operational platform.

Along with the new Kognifai enabled Vessel Insight solution, it supports the maritime industry's general migration towards shore-based management systems which can leverage advanced data analytics, derived from onboard sensors, to optimize fleet operations, servicing intervals and the allocation of spare parts. The same information-sharing principles would also provide vessel crews with the at-a-glance knowledge necessary to ensure observance of strict environmental compliance laws, while also enabling them to trade route and voyage details with port authorities to facilitate port operations and reduce the likelihood of congestion occurring.

If the benefits arising from a well-coordinated digital strategy are inarguable, some gently persistent encouragement may still be necessary to persuade certain firms to take up the reins. The most prudent advice in such cases is to begin with a manageable digital overhaul of processes such as log-keeping, accounts, predictive maintenance scheduling and customer service. A larger-scale digital plan of action can then, if desired, be gradually rolled out across all sectors of a company's business. The future is already upon us: and only the best-prepared should expect to emerge on the far side of the digital revolution with a smile and an ongoing, viable business.



Dredging U.S. Ports Requires a Diverse Fleet

The reasons for that are many and these realities cater to regulatory, commercial and regional needs.

By Michael Gerhardt

The U.S. dredging market is complex and relies on the diverse fleet of private dredging companies to get the job done. In addition to design and technical capabilities, environmental restrictions and regulations often dictate whether a trailing suction hopper dredge, cutter suction dredge, or mechanical dredge can respond to the coastal protection, wetland restoration, port deepening, and channel maintenance needs of the Nation. No matter what the need, domestic dredgers are meeting the challenge.

Trailing Suction Hopper Dredges

Trailing suction hopper dredges (TSHDs) operate hydraulically and are well-suited for dredging materials ranging from soft mud and silt to dense sands and clay. TSHDs may have one or two drag-arms that lower to the seafloor and suck up material in much the same fashion as a vacuum cleaner, as the dredge moves through the project area. The mix of material and water pulled in by the pumping system is then discharged into the "hopper" of the vessel. The solid, sandy part of this slurry sinks to the bottom of the hopper while the water separates, rises to the top, and drains overboard; creating what is known as water column turbidity. TSHDs are often restricted from working the inner harbors and reaches of U.S. ports due to environmental restrictions related to turbidity, marine ecosystems, and sea life. When the hopper is fully loaded, the TSHD sails to an unloading site to discharge the dredged material into the ocean through the bottom doors of the

hopper or to discharge it beneficially through a floating pipeline to rebuild coastlines and protect communities. Self-propelled and nimble, TSHDs operate well in high-traffic areas and in relatively rough seas, proving effective at ocean entrance channels and in deep water. They can transit quickly to placement sites under their own power without the need for tug assist or towing. TSHDs are used extensively for routine harbor maintenance, beach building, and clearing out the Mississippi River's Southwest Pass during the annual flood season.

Cutter Suction Dredges

Cutter suction dredges (CSDs), commonly known as "pipeline dredges," also operate hydraulically, using a mechanical device called a cutterhead with sharp rotating teeth to break up the bottom material so that it can be sucked through the dredge and discharged via floating pipeline. They dredge employing a sideways swinging motion using anchors and winches and move forward or "walk" by raising and lowering tall tower-like spuds. They can handle a variety of materials, including sand, gravel, clay, soft rock, and thin layers of hard rock. The floating pipeline used to transfer dredged material can extend many miles. For example, the Port of Corpus Christi Deepening Project is equipped with Great Lakes Dredge & Dock's CSD Carolina, which is transferring the material through five miles of pipeline to a placement site in the Gulf of Mexico. CSDs operate continuously yet lack the inclement weather maneuverability of TSHDs. Nevertheless, they are frequently contracted for many dredging projects, including wetland restoration, beach renourishment, land reclamation, port construction, and harbor maintenance.

Mechanical Dredges

Mechanical dredges remove material by scooping it from the seafloor and placing it into a barge or an approved placement area. Dipper, backhoe and clamshell dredges fit into this category. Each is mounted onto a large barge, towed to the dredging site, and then secured in place by anchors or spuds. They are well-suited for harbors, near docks and piers, relatively protected channels, and tightly confined footprints. Usually two or more disposal barges, called scows, are used in conjunction with a mechanical dredge. While one barge is filled with material, another barge transits to the disposal area and then returns to repeat the cycle, allowing for near continuous and uninterrupted operations. Mechanical dredges are particularly efficient on projects where the placement site is several miles away.

Clamshell Dredges

Clamshell dredges are designed to handle loose to medium dense soils and dredge materials, while backhoe and dipper dredges are used to remove consolidated or hard-packed materials and can be used to clear rock and debris. Hooded or enclosed buckets are utilized to control the flow of water and to prevent contaminated sediments from seeping back into the water column.

Horses for Courses: Environmental & Marine Fisheries Regulations

State and federal laws and regulations in the U.S. limit or exclude the use of particular dredges. Specifically, many port deepening, widening, and general maintenance projects exclude the use of hopper dredges because of turbidity and the potential impact to marine ecosystems and sea life, as stated earlier.

The National Oceanic and Atmospheric Administration (NOAA) closely regulates turbidity levels resulting from dredging activities. NOAA defines turbidity as "a measure of the clarity of a liquid (water) and is usually expressed as the amount of light that is scattered and absorbed by materials or particulates found in the water. The more that light scattering occurs, the higher the turbidity." Turbidity causes water to appear cloudy or muddy, but it is not a measure of the concentration of suspended sediments. Particulate matter in the water that contributes to turbidity includes inorganic solids (e.g. sediments), organic solids or detritus produced by living organisms, and living organisms (e.g. phytoplankton and zooplankton). Turbidity is influenced by a number of factors associated with sediment particles aside from the concentration of particles, including particle size and shape, refractive index (the

"... hopper dredge exclusions and restrictions have appeared and are continuing to appear in Army Corps solicitations for many of the most high-profile port deepening, widening and maintenance dredging projects in the United States, such as in the Houston Ship Channel, Baltimore, Savannah, Charleston, Port Canaveral, Boston, and San Juan, Puerto Rico."

Example Dredging projects and Local Restrictions:

Savannah Harbor Expansion Project:	*The solicitation specifically excludes the use of hopper dredges. Additionally, contractors are directed to take extreme care in lowering their mechanical buckets at the slowest possible speed to avoid disturbing manatees.*
Houston Ship Channel (Bayport to Morgan's Point):	*The solicitation only allows cutter suction dredges and mechanical dredges. It specifically calls for a pipeline dredge to handle the Houston Ship Channel and Bayport Docks portion, and it requires a mechanical dredge with scow barges to handle the Bayport Flare portion. Hopper dredges are completely excluded from all portions of the project.*
Boston Harbor Improvement Project:	*The solicitation states that dredged material shall be removed using mechanical dredges capable of removing the ordinary and hard material, loading it onto scow barges, and towing it to the offshore disposal sites.*

measure of light bending as it passes through one medium into another), color, and absorption spectra.

NOAA also states that total suspended solids (TSS) is a quantitative measure of the total dry weight mass of the particles or material present in a given amount of water. Measuring TSS is important for considering its effects on living organisms, especially when elevated concentration levels can harm organisms through gill choking or smothering eggs on the riverbed.

Federal and state agency determinations hold that turbidity and suspended sediment can affect marine life including but not limited to Atlantic salmon, shortnose sturgeon, Atlantic sturgeon, striped bass, and manatees, just to name a few. Hence, hopper dredge exclusions and restrictions have appeared and are continuing to appear in Army Corps solicitations for many of the most high-profile port deepening, widening and maintenance dredging projects in the United States, such as in the Houston Ship Channel, Baltimore, Savannah, Charleston, Port Canaveral, Boston, and San Juan, Puerto Rico.

The U.S. dredging industry has a long history of adapting and building a fleet tailored to meet the demands of the market in accordance with environmental regulations, and it continues these investments today with a $1.5 billion expansion program. Last year alone the private sector increased hopper dredging fleet capacity by 34% with the addition of two large TSHDs – specifically, Great Lakes Dredge & Dock Company's Ellis Island and Weeks Marine's Magdalen. This summer Weeks Marine also launched a new 30-inch cutter suction dredge, the JS Chatry, and The Dutra Group put into service a 6,000cy hydraulic dump scow. Callan Marine is currently building a 32-inch cutter suction dredge, Manson Construction Co. has commenced design on a large TSHD, and Cashman Dredging is procuring long-lead time equipment for the construction of two 6,000cy TSHDs.

All of these efforts – and more – are signs that domestic dredgers are producing the tools that the market requires and is well positioned to meet the Nation's needs today, tomorrow and for decades to come.

Michael Gerhardt *is Vice President, Dredging Contractors of America, and the CDMCS Pipeline Taskforce Director.*

Software Tools for Propeller Professionals

TrueProp is software for propeller inspection devices, assisting propeller manufacturers and repair shops to identify damage, repair and tune propellers to improve performance and save fuel.

By Adam Kaplan

Having the right tools for the job makes all the difference. Propeller professionals have looked to HydroComp for over 35 years for industry-leading analytical tools to ensure that the right propeller is installed on your vessel and performs effectively.

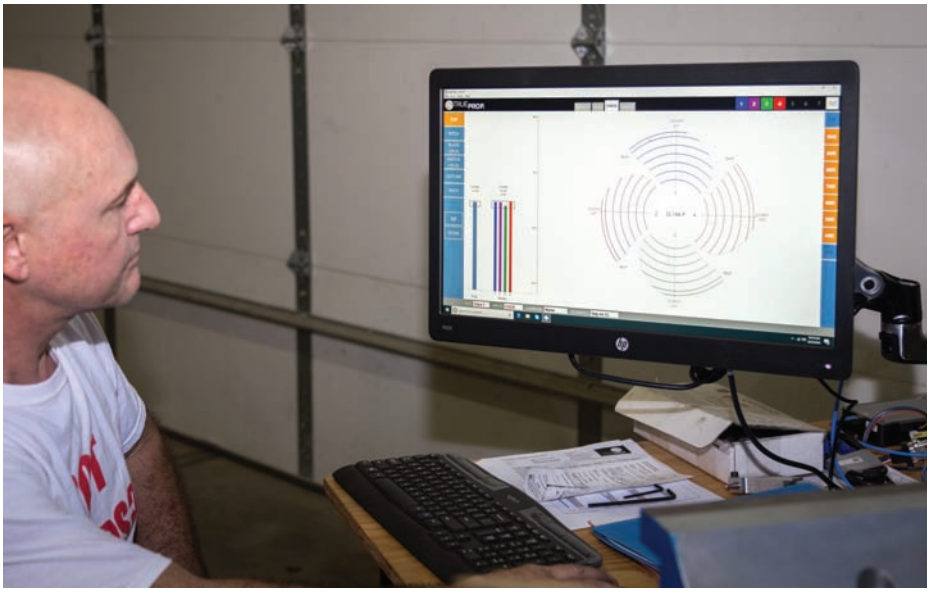
Choosing the right propeller is critical to the performance of your Vessel. Service yards, propeller manufacturers, and engine distributors use HydroComp PropExpert to size engines, gears, and propellers for different applications. PropExpert predicts top-speed, fuel burn, and efficiency for virtually any propeller – and includes a library of standard performance models from the most popular propeller manufacturers. With over 260 users world-wide, PropExpert is used for a wide variety of commercial and pleasure craft – from tugboats to motor yachts.

Some applications require a propeller that may not be available from any manufacturer. For custom propeller geometry, propeller designers and manufacturers use HydroComp PropCad to create highly-efficient propeller blade designs. PropCad allows designers to quickly setup the propeller geometry, prepare 2D drawings, inspection documents, and 3D models. Many manufacturers are exporting full 3D CAD models from PropCad to create fully CNC'ed custom propellers with incredibly tight tolerances.

Beyond Design: Repair Tools, too

As propeller design advances, so has demand for propeller repair and performance tuning. Repair professionals can now use TrueProp Software to measure and evaluate the quality of your propeller. TrueProp records data from the blade surfaces and uses the ISO-484 manufacturing criteria to identify damage and differences between each blade. This allows the propeller shop to bring your propeller back to those tight-tolerances – maximizing performance and putting power to the water with a propeller that is as-good or better-than new.

HydroComp, Inc. was established in 1984 and provides technical software for ship resistance and propulsion pre-



dictions, propeller sizing, and propeller design. TrueProp Software LLC was founded in 2017 as a sister-company and is the only independent and widely compatible software available for propeller inspection and repair. With over 600 customers world-wide, HydroComp Inc and TrueProp Software are working on propelling the propeller industry forward through next-generation solutions and tools.

TrueProp in Action

The Prop Specialists, operating for twenty-six years in Osage Beach, Missouri, is the only certified propeller repair shop in the Lake of the Ozarks. Their service range, however, extends all over the United States and several other countries. George and Dorothy Peter are the owners. Originally a marine mechanic, he also developed an affinity for propellers. As his knowledge base grew, so too did the local demand for propeller repairs, especially since many of the lake's mechanics and marinas were not tooled or equipped to work on propellers. When a propeller business went up for sale in 1992, George jumped at the opportunity.

Since the acquisition, George had to stop working on boats altogether due to the demand for propeller repair for Cool Breeze – The Prop Specialists. In order to cope with that demand, Cool Breeze acquired a new propeller scanning device and the PropPress 360, a Digital Data Scanner and a hydraulic propeller bending machine from Linden Propellers, which together with the new TrueProp Software led them to achieve more precise measurements.

The Peters are fervent supporters of the combined technology. "TrueProp, partnered with the Linden DDS and the PropPress 360, is the most accurate system on the market," says George. Before Cool Breeze incorporated TrueProp Software, they used manual methods to assess and repair their propellers. "We cleaned the prop a bit, assessed whether it was repairable with manual gauges, and beat the propeller with rawhide or brass hammers to get it to lay on a pitch block," says Dorothy.

"Then we beat it to the block with heat if necessary. We would weld the missing parts and grind it back to the appropriate thickness and shape, finish them, check and recheck, balance and ship. But we would never really know if it was 100% correct, how could we?"

Today, Cool Breeze can offer accurate repair to the highest standards available in the industry. "We can show our customers what was wrong with their prop, and then show them how it has been corrected. We are now having larger propellers shipped to us from all over the United States to repair."

Before Cool Breeze used the new TrueProp Software, boatowners in the region frequently had to send their propellers to Florida to be repaired, which could take up to a month. Then there was the added expense of transportation. Instead of relying on distant propeller shops with older inspection devices, Cool Breeze decided to bring the complete scan and repair process in-house. The arrival of the new technology at the lake has changed everything. "We have the ability to prove that the work was done right," says Dorothy. "Customers have complete confidence in us. Big props that used to go to Florida now come to us.

"You can't lie to TrueProp, and TrueProp doesn't lie to you." Since the acquisition of the new PropPress 360 and Linden DDS system with TrueProp Software, the everyday business routine at Cool Breeze may be increasingly busy, but it is easier to manage. It is catalogued chaos, held together in part by numbers and reports, technology and precision. There is no more need for guesswork, since TrueProp always gives them true results. www.truepropsoftware.com

*Senior Project Engineer, **Adam Kaplan**, is the lead developer of PropExpert and PropCad, HydroComp's propeller sizing and propeller design for tools. He has been with HydroComp for over a decade and is a frequent speaker at conferences. He holds a Master's of Science in Mechanical Engineering from the University of New Hampshire and is the regional membership chair of the Society of Naval Architects and Marine Engineers (SNAME) for New England.*

MacGregor's Fiber-rope Crane for Offshore Markets

MacGregor, part of Cargotec, has completed the construction of FibreTrac, the first fiber-rope offshore crane to enter the market. The crane's full potential is being validated and its capabilities have been demonstrated at an event in Kristiansand, Norway. "The project to build, certify and validate the MacGregor FibreTrac crane is the result of our confidence in its potential," says Høye Høyesen, Vice President, Advanced Offshore Solutions, MacGregor. "We strongly believe in the advantages that it will deliver to our customers."

FibreTrac uses existing, proven technologies combined in a new application that offers deep-water load handling operators a simple pathway to some of the most significant cost-saving advantages seen in decades. FibreTrac is able to exploit its full lifting capacity because fiber-rope weighs virtually nothing in water, so no additional load is experienced by the crane, regardless of the length of rope used during load handling operations. This is in complete contrast to steel wire-rope cranes.

"In practical terms, this means that a smaller crane and vessel can be used for more assignments, and owners are able to bid on a wider range of contracts. The ability to use smaller vessels for deep-water projects will also drive down the cost of these operations and give our customers a stronger competitive edge."

"Feedback from the event was extremely positive," Høyesen continued, adding, "We were able to present the finished crane to demonstrate how the shift from steel-rope to fiber-rope in offshore cranes is technologically possible and how the crane delivers substantial cost benefits to owners, particularly for deep-water projects."

Although the crane is new, the technology is tested, combining decades of MacGregor's load handling expertise with the fiber-rope tensioning and handling skills of Parkburn Precision Handling Systems.

Designed to comply with rigorous DNV GL regulations, the FibreTrac crane has a 150-tonne safe working load (SWL) capacity and features an advanced rope monitoring and management system that maximizes rope lifespan and provides clear lift line status information for the operator at all times.

MacGregor's experience in intelligent maritime cargo and load handling includes a strong portfolio of MacGregor, Hatlapa, Porsgrunn, Pusnes, Rapp and Triplex products, services and solutions, all designed to perform with the sea. **www.cargotec.com**

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Navigating the Rough Waters of Marine Certification

By Dr. Alexandre Orth, a Senior Manager at Marine & Subsea Technologies at Bosch Rexroth

The marine industry brings its own unique set of challenges. With the 'All Subsea Factory' market trend moving offshore exploration and production equipment for oil and gas to the seabed, safety, longevity and environmental protection are just a few of the considerations when choosing marine products. When selecting products for marine applications, the understanding of factors such as marine certifications and inspection documents are crucial to making an informed decision.

Worldwide statutory provisions enacted by the United Nations (UN) agency on shipping specify general regulation and rules necessary to obtain an operating license for all categories of ship, marine and offshore applications. The size, intended use and type of ship, as well as the application of the ship's operating equipment and installation room, define the mandatory types of inspection documents and certificates needed for approval. With higher hazard potential, the legal requirements and approval tests necessary to be accepted and certified by the respective classification society become stricter.

The International Maritime Organization (IMO)

With regard to marine certifications, there are a lot of involved organizations to understand. Starting with the International Maritime Organization (IMO), which is a specialized agency of the UN. Its primary purpose is to develop and maintain a comprehensive regulatory framework for shipping. Its remit includes safety, environmental concerns, legal matters, technical cooperation, maritime security and shipping efficiency.

The IMO is the source of approximately 60 legal instruments that guide the regulatory development of its member states to improve safety at sea, facilitate trade among seafaring states and protect the maritime environment. The most well known are the International Convention for the Safety of Life at Sea (SOLAS), the International Convention for the Prevention of Maritime Pollution (MARPOL) and International Convention of the Safe and Environmental Sound Recycling of Ships ("Green Passport").

Classification Societies

In addition to the IMO, classification societies add another level to the marine certification structure. A classification society is a non-governmental organization that establishes and maintains technical standards for the construction and operation of ships and offshore structures based on IMO regulations. The society also validates that the construction adheres to set standards and executes regular surveys to ensure compliance with the standards.

Classification societies are also responsible for classifying oil platforms, submarines and other offshore structures. Their extensive survey process covers diesel engines, important ship-board pumps and other vital machinery. Classification surveyors inspect ships to ensure that its components and machinery are built and maintained according to the standards required for their class. Typically, classification societies provide general requirements for ships and application-specific requirements in standards (e.g. standards for lifting appliances, standards for mobile offshore drilling units, etc.).

Major classification societies are members of the International Association of Classification Societies (IACS), which is a technically-based organization headquartered in London that currently consists of twelve marine classifications societies. Marine classification is designed to promote occu-

Credit: Bosch Rexroth

With all the intricacies involved, partnering with a knowledgeable company like Bosch Rexroth for marine product solutions is crucial to success in the industry.

pational safety, property and the environment. This promotion is achieved through the establishment and verification of compliance with technical and engineering standards for the design, construction and life-cycle maintenance of ships, offshore units and other marine-related facilities. These standards are contained in rules established by each individual society.

Although IACS is a non-governmental organization, it plays a role within the IMO, for which IACS provides technical support and guidance and develops unified interpretations of the international statutory regulations developed by the member states of the IMO. Once adopted, these interpretations are applied by each IACS member society when certifying compliance with statutory regulations on behalf of authorizing flag states.

Inspection Documents and Certificates

Depending on the function for which a product is used, specific approval from classification societies may be required. This specific product approval or certification requires the societies' involvement for establishing individual product certificates or for issuing general applicable product type approvals. Product certificates may be according to standard EN10204, while type-approval certificates require a specific format from the society involved. According to EN10204 standards, the certificates can be summarized into two categories.

The first category involves non-specific inspections, which are issued for non-essential equipment. This means inspected equipment is without hazard potential for life or limb and includes applications such as cranes or winches. This category includes a Declaration of Compliance with the order (Type 2.1) and a Test Report (Type 2.2). A Type 2.1 declaration is a document in which the manufacturer declares that the products supplied are in compliance with the requirements of the order, without the inclusion of test results. A Type 2.2 report is similar, but the requirements of the order are fulfilled with the provision of test results based on a non-specific inspection.

The second category is defined by specific inspections, which are issued for essential equipment, meaning inspected equipment has a hazard potential for life and limb. Hazardous equipment includes applications such as steering gears and propulsion systems. This category includes Inspection Certificates Type 3.1 and 3.2. A Type 3.1 certificate is a document issued by the manufacturer in which they declare that the products supplied are in compliance with the requirements of the order and in which they supply test results. This document is validated by the manufacturer's authorized inspection representative, independent of the manufacturing department.

A Type 3.2 certification is a document prepared by both the manufacturer's authorized representative, independent of the manufacturing department and either the purchaser's authorized representative or the inspector designated by the official regulations. Like the Type 3.1 certificate, this certificate declares the products supplied are in compliance with the requirements of the order and in which test results are supplied.

For both the Type 3.1 and 3.2 certificates, it is permissible for the manufacturer to transit relevant test results previously obtained by a specific inspection on primary or incoming products to the inspection certificate, provided that the manufacturer operates traceability procedures and can provide the required corresponding inspection documents.

Conclusion

With so many organizations involved and documentation types, it's easy to get overwhelmed with the certification and inspection process for marine products. With all the intricacies involved, partnering with a knowledgeable company – like Bosch Rexroth, for example – for marine product solutions is crucial to success in this industry. Whatever your chosen route to rolling out new equipment, choose a partner that can provide a wide range of certified products, assemblies and systems for both on deck and below deck applications. Moreover, navigating those multi-faceted certification processes requires the expertise that, more often than not, emanates from a single source provider.

VT HALTER MARINE, Q-LNG HOST NAMING CEREMONY

'Celebrating shipbuilders and protecting our nation' were the main messages as VT Halter Marine conducted a vessel naming ceremony for America's first offshore Liquefied Natural Gas Articulated Tug and Barge (LNG ATB) unit. The Q-LNG 4000 (barge) and the Q-Ocean Services (tug) were officially named in a ceremony that included U.S. Senator Roger Wicker, U.S. Senator Cindy Hyde-Smith and U.S. Rep. Steven Palazzo, along with Shane Guidry, CEO of Q-LNG, and Tom Vecchiolla, President and CEO of ST Engineering North America.

Over the last four years, Jones Act ship operators have taken steps to transition their fleets to use cleaner burning fuels, including LNG. The barge is designed to provide ship-to-ship transfers of LNG to vessels that use LNG as a fuel source and also ship-to-shore transfers to small scale marine distribution infrastructure in the U.S. Gulf of Mexico and abroad. The ATB tug will have 5,100 horsepower, GE 6L250 MDC EPA Tier 4 main engines, with Wartsila Z-drives. The barge is designed to carry 4,000 cubic meters of LNG.

The LNG Articulated Tug and Barge (ATB) will have an articulated (hinged) connection, which allows for separate movement between the two parts. Anticipated delivery of the first unit is in the first quarter of 2020. "No other company has an ATB this close to delivery," said Shane J Guidry, Chief Executive Officer of Q-LNG Transport. "Q-LNG is focused and dedicated to deliver extremely safe transit to all the ports it will service, and we are committed to being a leader in the development of LNG infrastructure in the United States and abroad."

The ATB LNG unit is part of a long-term contract with Shell Trading (U.S.) Company, to deliver LNG as a fuel source to various ports in Florida and the Caribbean. It will bunker Carnival Cruise Line's two new dual-fuel ships and two dual-fuel Siem Car Carrier pure car truck carriers chartered by the Volkswagen Group to transport vehicles from Europe to North America.

The Q-LNG 4000/Q-Ocean Service at a glance:

Tug Name: Q-Ocean Service	Class: ABS	Depth: 32'.6"
Tug LOA: 128'	Flag: USA	Capacity: 4,000 m3 LNG
Tug Beam: 42'	Barge Name: Q-LNG 4000	Main Engines: GE 6L250 MDC
Tug Depth: 21'	Barge LOA: 324'	EPA Rating: Tier 4
Tug HP: 5,100	Barge Beam: 64'	Builder: VT Halter

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SAFE Boats Delivers 19th Boat to FDNY

SAFE Boats International (SAFE) has delivered boats 17, 18 and 19 to the marine division of the New York Fire Department, all during the month of August. The three latest additions to the FDNY fleet are 33' full cabin boats, the most popular configuration because of the options it provides the crew in terms of maneuverability and operability. Vessels capable of fighting fires from the water is not a new concept; over the years SAFE has helped agencies around the country – and the world – add technology-forward options to their water-borne public safety operations.

Lake Assault Delivers Multi-Mission Craft to Secaucus, NJ

The Secaucus (NJ) Fire Department has placed a 28-foot Lake Assault Boats firefighting and rescue craft into service. The department's firefighting and emergency response area includes a large portion of the Hackensack and Passaic Rivers (and their 28 bridges) that empty into Newark Bay and the Hudson River. The boat's landing craft style hull sports a 63-inch hydraulically operated bow door (with an integrated ladder for divers) and is fitted for ATV deployment. The boat features a clear opening dive door, swimmer's grab rails, a davit crane, and a floating stokes basket for faster patient retrieval from the water. Powered by twin 350 hp outboards, the boat reaches 50 miles per hour in open water. The full-width, fully enclosed pilothouse is located midship with deck space both fore and

aft. Equipped with Chemical, Biological, Radiological and Nuclear (CBRNE) positive pressure defense capabilities, its firefighting capabilities include a 1500 gpm fire pump powered by a dedicated 350 hp marinized V-8 engine.

TSGI to Provide Construction Oversight for TxDOT Ferry

In 2017, The Shearer Group, Inc. (TSGI) was awarded a five-year Indefinite Deliverable contract with the Texas Department of Transportation (TxDOT). TSGI was tasked to provide the detail design of a double-ended diesel-electric ferry with energy storage, providing service from Galveston to Bolivar Peninsula. The ferry is being built at Gulf Island Shipyard in Jennings, Louisiana. TSGI will provide construction oversight to TxDOT during the entire construction process. The diesel-electric with energy storage system will be provided by Siemens utilizing their Bluedrive PlusC technology with 1.4MWHr of energy storage to increase the safety and reliability of the vessel.

LOA: 293'	Propellers: (2) Voith Schneider cycloidal	DRAFT: 16'
Beam: 66'	Capacity: 70 Car / 495 PAX	Builder: Gulf Island

Metal Shark Expands Into Peru

USA-based Metal Shark has expanded into the country of Peru, with a new patrol boat order now in production, and a multiyear co-production agreement with the state-operated Peruvian shipyard Servicios Industriales de la Marina (SIMA-PERU SA). The first round of Peruvian Navy maritime interdiction vessels are now being built by Metal Shark in the United States. Under a co-production agreement with SIMA, Metal Shark plans to deliver multiple similar vessels to Peruvian interests through training and design transfers, technological resources, and production methodologies to SIMA. Designed by Metal Shark, the 45 Defiant is an increasingly popular platform, with multiple vessels in service in the US, the Caribbean, and Asia. Powered by twin inboard Cat Marine diesel engines coupled with Hamilton water jets, the vessel will reach speeds well in excess of 40 knots.

Robert Allan Designs New Pusher Tug for Brazil

Two modern pusher tugs for Hidrovias do Brasil S.A., have begun operation in Brazil, to a customized design from Robert Allan Ltd. of Vancouver, Canada. The tugs will push barges containing bulk products in the Amazon River system. This shallow-draft pusher tug, HB PIRARARA and her sister vessel, HB PIRARUCU are RApide 4000-Z3 tugs. Construction was successfully completed by Estaleiro Rio Maguari in Belem, Brazil. All vessels are designed to meet Brazilian Flag State requirements and provide the highest standards for crew comfort and safety. The wheelhouse provides maximum all-round visibility with a split forward control station providing unobstructed vision to the foredeck working area as well as to the convoy of barges ahead.

LOA: 39.6 m	Main Propulsion: (3) Wärtsilä 8L20	Beam, moulded: 18.0 m
Class: ABS	Z-Drives: Schottel SRP 1215	Depth, moulded: 4.0 m
Normal draft: 2.8 m	Gen-Sets: (2) Caterpillar C18 Diesel	Minimum draft: 2.4 m

Armstrong Delivers Another Vessel to Washington DNR

Credit: Maddie Hunt

The monohull dive compliance vessel Salish Scout was recently accepted by the Washington State Department of Natural Resources (DNR) after successful launch and sea trials in Port Angeles Harbor. In a competitive solicitation process last year, DNR selected Armstrong Marine's proposal to design and build multiple vessels for their Marine Law Enforcement program. Salish Scout is a sister ship to the vessel Sentry, completed earlier this summer. Salish Scout 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.

SCHOTTEL Delivers Propulsion for World's First Emission-Free Pushboat

The innovative Elektra push boat, ordered by BEHALA and developed at the Department of Design and Operation of Maritime Systems at the Technical University of Berlin, will be equipped with rudderpropellers from SCHOTTEL. The hybrid canal push boat is powered by a combination of fuel cells, batteries and an electric motor. The Elektra, which is currently under construction at the Hermann Barthel shipyard in Derben (Germany), will be the first emission-free push boat worldwide. The vessel will use the fuel cell technology for the basic energy supply of the power train and for the shipboard electrical system. At peak loads, additional energy is provided by batteries. Hydrogen supplied to the fuel cell is generated via electrolysis from green wind power.

LOA: 20 m	Rudderpropellers: (2) SCHOTTEL SRP 100	Service Speed: 10 KT
Width: 8.20 m	Steering & control: SCHOTTEL	Max Thrust Load: 1,400 tons

AAM Launches Duke University RV

All American Marine (AAM) completed construction and launched an aluminum research and survey vessel for Duke University. The Duke University Marine Lab (DUML) is a hydrofoil-assisted catamaran and is an exemplary arrangement from Teknicraft Design. AAM is the exclusive builder of Teknicraft Designs in North America. Based upon two successful Teknicraft Design vessels AAM built for NOAA, this patented hydrofoil-assisted hull design is proven to have industry-leading low-wake wash energy and fuel economy. The vessel was procured as part of an $11 million gift for the construction and operation of a new state-of-the-art research vessel that will expand teaching, research and outreach capabilities at the Marine Lab.

Cummins X15-Powered Lobster Boats

Credit: Cummins Eastern Canada

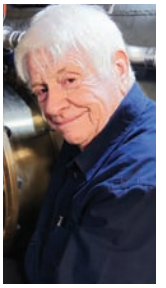
When Steve Corkum of Yarmouth Sea Products couldn't find a yard prepared to build 15 lobster boats in a single order, he started his own. Bayview Marine recently launched the first in the 15-boat series and is pleased with the initial performance. The hull is designed for maximum working space and stowage for lobster or crab traps. The first of the series of fiberglass vessels performed well on trials. Propulsion is provided by a six-cylinder Cummins X15 diesel rated for 500 HP at 1800 RPM. The boats are the first commercial fishing application of this engine and will have an upgraded Sea-Pro Filter system to allow extended fuel service maintenance, as well as a first of its kind F.I.T. Telematcis filtration monitoring System from Cummins.

U.S. Congressman Elijah Cummings Passes Away at 68

On Thursday October 17, 2019, Congressman **Elijah E. Cummings** (MD-07) passed away due to complications concerning longstanding health challenges. The energetic Cummings was best known in maritime circles for his time spent as chair of the Subcommittee on Coast Guard and Maritime Transportation where, among other things, he advocated for a more diverse student body at the U.S. Coast Guard Academy. Additionally, he was a vocal supporter of bringing maritime related curriculum to secondary and elementary schools, primarily as a way to recruit a more diverse and robust waterfront workforce at a time when existing maritime workers - ashore and afloat - were retiring in alarming numbers. Without a doubt, his influence on the domestic waterfront impacted many aspects of the nation's maritime industry, and he was passionate about his responsibilities there.

Seaspan Shipyards

Clarke **MacLeod** **Hargreaves**



Thomson

Oliver

Diaz

Seaspan Shipyards Announces Management Additions

Seaspan Shipyards announced the appointment of **James Clarke** as Chief Financial Officer (CFO). With more than 15 years of senior finance experience in engineering and industrial environments. Clarke brings his strong background in strategic finance to Seaspan's growing shipbuilding and ship repair operations. Clarke holds a Bachelor of Arts degree in economics and an MBA in Finance from Brigham Young University. Seaspan also announced the appointment of **Amy MacLeod** as Vice President, Corporate Affairs & External Communications. MacLeod joins Seaspan with over 25 years of communications experience in the technology and defense sectors. Separately, Seaspan also named **David Hargreaves** as Vice President, Strategy & Business Development. Most recently, David was a Vice President at MDA, a Canadian system engineering company. He has a Master of Applied Science from Simon Fraser University and earned a MBA from Queen's University.

Thordon's Polymer Pioneer Wins Award

Thordon Bearings' founder and polymer materials pioneer **George A. (Sandy) Thomson** has been awarded the global transportation sector's most distinguished accolade, the Elmer A. Sperry Award 2019 for "Advancing the Art of Transportation." Sandy studied aircraft maintenance at Northrop University in Inglewood, California and graduated as a mechanical engineer. After a brief stint working for a Boston based mechanical seal manufacturer, he returned to Canada to join Thomson-Gordon Ltd, founded by his grandfather in 1911. Over time, Sandy's pioneering work in eliminating a major cause of ocean pollution – oil leaked from conventional oil lubricated tailshafts – has prevented millions of liters of oil leaking into the sea and rivers.

Vancouver's Oliver Receives Distinguished Service Award

The Pacific Northwest Waterways Association (PNWA) has recognized Port of Vancouver USA Commissioner **Jerry Oliver** with a Distinguished Service Award for his dedicated service to the maritime industry, including leadership on port and navigation issues that impact the economic health of Southwest Washington and the entire Pacific Northwest. Oliver was elected to the Board of Commissioners in 2007 and has helped usher in a period of tremendous growth and success at the port.

Perea Diaz Receives Parkinson Award

The Institute of Navigation's (ION) Satellite Division presented **Dr. Santiago Perea Diaz** with its Bradford W. Parkinson Award in September. Perea Diaz was recognized for graduate stu-

Milito Luthi

Orvieto

Pierce

Caez

Dillman

dent excellence in Global Navigation Satellite Systems in his thesis, "Design of an Integrity Support Message for Offline Advanced RAIM." The Award recognizes an outstanding graduate student in the field of Global Navigation Satellite Systems (GNSS).

Milito Named NOIA President

Erik Milito has been named president of the National Ocean Industries Association (NOIA). Milito comes to NOIA from the American Petroleum Institute (API), where he served for the past 17 years, most recently as Vice President, Upstream and Industry Operations. Milito holds a Juris Doctor from Marquette University Law School, and a BBA from the University of Notre Dame. Former NOIA President **Randall Luthi** served for nearly a decade before departing in July of 2019 to be the Chief Energy Advisor to the Governor of Wyoming.

Orvieto to Lead of ZF's Commercial & Fast Craft Unit

Drew Orvieto, the North American head of engineering for ZF's Marine and Special Driveline business unit has been promoted to the head of the Commercial and Fast Craft business unit. Orvieto will have a dual responsibility as he will continue with his responsibility for engineering. Orvieto returned to ZF in 2015 after completing a Master's degree in engineering, followed by a period as a naval architect at a large American boat builder.

Bollinger Promotes Pierce

Bollinger Shipyards announced the promotion of **Christian Pierce** to Director of Engineering. He will lead the engineering department on both government and commercial programs. Pierce has over 20 years of shipyard experience and has held various positions of authority from Principle Naval Architect to Engineering Manager. He holds a Bachelor of Science in Naval Architecture and Marine Engineering from the University of New Orleans.

VPA Mourns Loss of Diamonstein

The Virginia Port Authority Board of Commissioners last month lost an important member of its team the passing of Commissioner **Alan A. Diamonstein**. Diamonstein's service to The Port of Virginia began April 17, 2014. He was chairman of the port's growth and operations committee and was instrumental in the oversight of the $750 million expansion of the port's two primary container terminals. "He was a personal friend, an asset to the board and someone who truly understood the long-term value of a creating a world-class port," said John F. Reinhart, the port's CEO and executive director.

Crowley Adds to Petroleum Transportation Team

Crowley Shipping has added **Jorge Caez** to its chartering services team. Caez, as director of chartering, brings significant experience to Crowley from the offshore, heavy-barge segment and bunker markets. He previously held multiple positions in major barge transportation and petroleum companies, including roles in chartering, marketing, purchasing and sales coordination. A graduate of Penn State University, Caez will be based in Jacksonville, Florida.

Dillman Named President of Gateway

Gateway announced the appointment of **James** ("**Jim**") **Dillman** as President of the company. In this role, Dillman will be responsible for leading the operations and commercial activities of Gateway Terminal in New Haven and Gateway New London. Dillman joins Gateway with over 30 years of leadership and management experience in the terminal, marine, and shipping logistics industries. Dillman graduated from the United States Merchant Marine Academy in 1986 with a Bachelor of Science in Marine Transportation.

Martin named GM at Crestliner Boats

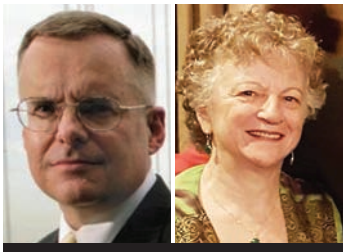
Crestliner Boats has named **Jack Martin** as General Manager. Martin has been with Brunswick Corporation since early 2018 as a part of Mercury Marine's strategy and development team Prior to starting at Brunswick, Martin spent four years at AAR Corporation in Chicago.


Martin


Van Dijk


García


Naylor


Witt O'Brien's, LLC

Paczkowski Henschel

Svitzer America Names New COO

Svitzer has brought on board **Arjen Van Dijk** as its new CCO for Svitzer Americas. With more than 15 years in global shipping and transportation, the Dutch maritime professional brings to Svitzer extensive knowledge and insights from industry.

García Appointed to SENER's BoD

The SENER engineering and technology group has appointed **Rosa García** as a member of its Board of Directors. With over three decades of combined international experience in the Information Technology, Energy, Infrastructure and Industry sectors, García holds a degree in Mathematics from the Universidad Autónoma de Madrid. She previously spent most of her career at Microsoft in executive positions.

Naylor Named Director at Resolve Maritime Academy

Resolve Maritime Academy welcomed **Chauncey Naylor** as the Academy's new Director responsible for operational management, strategic course, and certification development. Naylor comes to Resolve from Williams Fire and Hazard Control in Port Arthur, Texas with extensive experience leading safety management and emergency service teams.

Witt O'Brien's Expands Senior Leadership Team

Witt O'Brien's, LLC announced that **John Paczkowski** and **Ricki Henschel**


Piccione


Gage


Mid-Atlantic Maritime Academy

Puritis Blanchet Rockwood


Ingalls Shipbuilding


Shea & Lytle


Griebenow

have joined the firm in senior leadership positions. Paczkowski joins the firm as Senior Managing Director. Most recently, Paczkowski served as Senior Vice President at ICF International. Henschel joins the firm as Vice President of Business Development. She will lead business development operations, including proposal management and capture strategy for major pursuits and core business opportunities. Henschel previously served as SVP of Business Development and Innovations Learning Practice Lead and SVP of Business Development Operations at ICF International.

PSG Names Piccione as CEO

Pure Safety Group (PSG) announced that it has named **Joseph Piccione** as chief executive officer. Piccione's start date with the company will be August 19. Most recently, Piccione served as CEO of Jindal Films Americas, the world's largest producer of films used in the food, beverage and consumer markets. Piccione holds a bachelor's degree in technical careers from Southern Illinois University.

Engineers in Motion – Robert Gage, P. Eng.

Robert Allan Ltd. announced that **Robert Gage** has earned his accreditation as a Registered Professional Engineer with Engineers and Geoscientists British Columbia. Robert has been working with Robert Allan since 2015 as a Naval Architect where he has been involved in all aspects of ship design, specializing in designs using alternative fuels and aesthetic design. He obtained his Master's degree in Naval Architecture and Marine Engineering from the University of British Columbia.

MAMA Reorganizes Senior Management Team

Mid-Atlantic Maritime Academy has reorganized the upper management tier of the school. Chief Engineer **Doug Puritis**, was appointed Vice President of Academics. Chief Engineer **Ray Blanchet** serves as the Vice President of Operations and has expanded the curriculum base. Both are retired senior Chief Engineers from Military Sealift Command with over three decades of experience apiece. **Captain Randall Rockwood** also joined Mid-Atlantic Maritime as an advanced course instructor, and assumed the role as Director of Shiphandling following his retirement as a Senior Master with the Navy's Military Sealift Command.

HII Opens Shipbuilder Academy in Gulfport

Ingalls Shipbuilding celebrated the opening of its new Shipbuilder Academy site in Gulfport. Participating in the ceremonial ribbon-cutting were **Glen East**, superintendent of Gulfport School District; **Ciara Coleman**, program manager for the W.K. Kellogg Foundation; Ingalls Shipbuilding President **Brian Cuccias**; **Edmond Hughes**, Ingalls' vice president of human resources and administration; and **Dr. John R. Kelly**, chief administrative officer for the City of Gulfport. Shipbuilder Academy was established in 2016 at Ingalls' Maritime Training Academy with a mission to provide enrolled students with a strong foundation in the maritime industry and fill the current industry skills gap.

Connie Awards for Lytle, Shea

Some 300 transportation leaders packed a hotel ballroom in September as the Containerization and Intermodal Institute presented its Connie Award to **William J. "Bill" Shea**, CEO of Direct ChassisLink. **J. Christopher Lytle**, recently retired Executive Director of the Port of Oakland and former head of the Port of Long Beach, was given the group's Lifetime Achievement Award. Shea serves on the Board of Directors of DCLI and Blume Global and on the Board of the International Institute of Container Lessors. Lytle has held many senior leadership positions within the industry, including serving as Executive Director of the Port of Long Beach.

HII Appoints New VP for Nuclear and Environmental Services

Bret Griebenow has been named vice president of business development for nuclear and environmental services within its Technical Solutions division. Before joining HII, Griebenow worked as the project manager for the Pueblo Chemical Agent-Destruction Pilot Plant for Bechtel National. Griebenow earned a bachelor's degree in mechanical engineering and a master's degree in systems engineering from the University of Idaho.

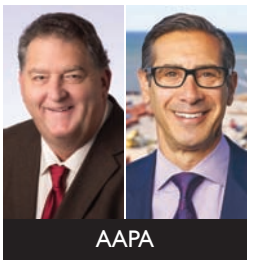

Crowley Scholarships

Aaron MacPherson


Damidaviciute


Baker & Falconetti


Cabrera



Nelson Friedman


Smith

Crowley Scholarships for CMA Students

Crowley Maritime recently awarded Thomas B. Crowley Sr. Memorial Scholarships to four California State University Maritime Academy cadets at the Containerization and Intermodal Institute's Connie Awards in Long Beach, CA. **Spencer Hoffman**, is currently a junior studying marine transportation. **Samuel Comerford** studies marine transportation with a minor in naval science and a commission as an officer in the U.S. Navy Reserve. **Jewel McLain** is studying marine engineering technology. **James Kling** is studying marine transportation. Since 1984, Crowley has provided more than $3 million dollars in scholarship funding for more than 1,000 students.

HydroComp Celebrates 35 Years of Service

HydroComp is celebrating 35 years of serving the global marine community. The firm is best known for its contributions to naval architecture companies in more than 65 countries via its engineering design software. Managing Director **Jill Aaron** and Technical Director **Donald MacPherson** founded the New England-based company in 1984. The company's myriad software offerings include NavCad, PropCad, PropElements and PropExpert.

Dan-Bunkering Welcomes Purchaser

Dan-Bunkering (America) Inc. in Stamford, CT, is pleased to announce the employment of **Agne Damidaviciute** as Purchaser. Agne comes from a similar position at a company based in The Netherlands. Before joining Dan-Bunkering, her education and professional career brought her to Denmark, Brazil and the Netherlands, and finally Stamford, CT.

New Officers for JAXPORT's BoD

The JAXPORT Board of Directors selected new officers during its regular monthly meeting today, unanimously electing Jacksonville business executive and civic leader **John D. Baker II** as Chairman. Baker is Executive Chairman and Chief Executive Officer of FRP Holdings, where he served as President and Chief Executive Officer from 2008-2010 and Executive Chairman from 2010-2015. Also named to the Board were Vice Chairman **Jamie Shelton**, (Treasurer) **Wendy Hamilton**, President and (Secretary) **J. Palmer Clarkson**.

Alberto Cabrera joins JAXPORT

The Jacksonville Port Authority (JAXPORT) welcomes **Alberto Cabrera** as Director, Cruise and Cargo Development. Cabrera has more than three decades of business development and operations experience, including 15 years in the Puerto Rico trade. Cabrera holds a bachelor's degree in business development and marketing. He is a past president of the Jacksonville Propeller Club.

AAPA Installs 2019-20 Slate of Officers

AAPA 2019-20 Chairman of the Board **Gary Nelson**, Executive Director, Port of Grays Harbor Gary G. Nelson, executive director for the Port of Grays Harbor, Aberdeen, WA, was officially installed for a one year term as the 2019-20 chairman of the board for the American Association of Port Authorities (AAPA) in October. Nelson succeeds **William D. Friedman,** president and chief executive officer for the Port of Cleveland, who began his one-year term in October 2018.

NOSAC Approves OMSA-Driven OSV Report

The National Offshore Safety Advisory Committee (NOSAC) approved recommendations to increase the ability of energy-industry vessels to assist in disaster response activities. The proposal can be found in the final report entitled, *"Use of Offshore Supply Vessels (OSVs) and other vessels in restoration and recovery efforts."* The report was produced by a team of industry experts on the Restoration and Recovery Activities Subcommittee. In Hurricane Maria's aftermath, several Louisiana-based vessels attempted to carry cargo to or between ports in Puerto Rico. Nevertheless, many were turned away due to interpretations of U.S. Coast Guard regulations. OMSA President **Aaron Smith** said, "U.S. companies have invested billions in building complex and versatile vessels and the training of American mariners to safely operate those vessels. This report creates an innovative framework for utilizing these investments to help Americans and our neighbors in their time of need."

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

HOLDFAST – Engineered with One Key Goal in Mind: Grip

Holdfast utilizes HMPE and nylon fiber to deliver a lightweight, high-strength, floating line that will grip on H-bitts and capstans much better than traditional 100% HMPE lines. Holdfast is coated with TEUFELBERGER's proprietary abrasion resistant coating that is specially formulated to yield higher strength and more durable and water-resistant lines. Coatings are available in assorted colors.

www.teufelberger.com/en/holdfast.html

SCHOTTEL Rudder EcoPeller SRE

SCHOTTEL's azimuth Rudder EcoPeller SRE delivers on a wide range of applications for open sea and coastal operating conditions, particularly for the ferry sector, where it demonstrates its highly efficient and ecologically clean propulsion while also meeting the strict environmental regulations of the Norwegian market. As a result, SCHOTTEL has achieved a top market position there by providing propulsion systems for 16 ferries in various power ratings.

www.schottel.de

New York Blower's Versatile Vaneaxial Fan

The New York Blower Company has expanded its line of industrial axial fans with the Vaneaxial Adjustable Pitch Direct Drive Fan. The fan is ideal for high-flow, high-pressure applications in industries including, process supply and exhaust and transportation. The fan's inline, compact design is efficient for applications confined by space, reaches a volume of 120,000 CFM and is precisely manufactured to improve efficiency.

www.nyb.com

Marakeb Technologies Delivers Unmanned Drive

Marakeb Technologies recently integrated its autonomous solution into an Unmanned Surface Vessel project. A 16 foot work vessel now operates autonomously using Marakeb's patented device, the MAP Pro. Autonomous operations involve programming routes and instructions to navigate a scenario on its own, including a path layout, programmable speeds, warnings, failsafe protocols and live data relay from all sensors on the vessel back to a ground control station.

www.almarakeb.net

Sennebogen to Deliver World's Largest Material Handler

SENNEBOGEN will deliver the first of its new record-setting 895 E Series model to North American customers next year. At an estimated 390 tons and reach of more than 130 feet, the 895 E is the largest material handler ever built. The 895 E is powered by a 755 HP (563 kW) diesel motor or optional 670 HP (500 kW) electric drive motor. It's offered with a choice of three standard undercarriages.

www.senebogen.com

PEMA T-Beam Production Line Improves Shipbuilding Efficiency

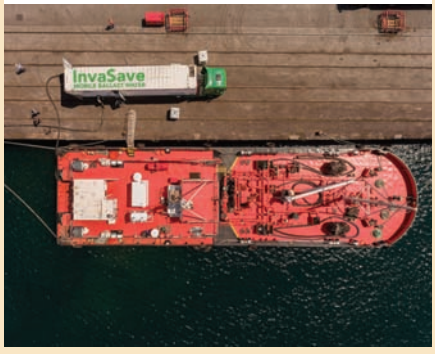
In shipbuilding, automated PEMA T-beam production lines enable high capacity and geometrically precise T-beams. The goal of advanced flat panel fabrication process is to minimize panel deformations and maximize output of the fabrication line. This requires accuracy in panel fabrication, as well as geometrical precision of welded sub-assemblies, such as T-beams, which are welded to flat panels.

https://pemamek.com

InvaSave Mobile BWT System

The InvaSave 300 IMO-certified system is an external ballast water treatment unit that uses mechanical filtration and ultraviolet radiation to eradicate invasive organisms from discharged ballast water, to IMO-D2 standards. InvaSave can also provide ballast water of the same quality to outbound vessels. It is packaged in a single, 40-foot container; ideal for placing on a barge, workboat or trailer for easy movement around a port.

www.damen.com



Dometic's Combined Cooling & Heating System

Dometic's VARCX/X30 Variable Capacity Chiller and Diesel Fired Heating System provides mariners with energy-efficient climate control under a wide range of conditions. This advanced marine climate control solution combines proven and energy-efficient VARCX variable capacity chilled-water cooling system with an innovative low emission diesel fired heating solution. The new X30 system is a 31,000 BTU system that has the ability to vary capacity down to 15,000 BTUs.

www.dometic.com

Pipe Freezing for Quick Pipe Repairs

Qwik-Freezer Pipe Freezing System eliminates the need to drain pipework by creating a freeze plug. The Qwik-Freezer is a cost effective, quick way to perform pipeline maintenance without draining the system, with little or no system downtime. Larger pipe diameters than 8" and the use of anti freeze and rust inhibitors can create the need for the liquid nitrogen (LN2) temperatures of the Accu-Freeze System.

www.huntingdonfusion.com

FLIR Introduces M300 Series Marine Cameras

FLIR Systems' M300 Series is a maritime thermal camera delivering advanced awareness-enhancing technologies, safer navigation, and seamless onboard integration. FLIR M300 Series cameras are designed for professional mariners and first responders who operate in harsh marine environments, facilitating safer navigation through improved image stabilization using an integrated attitude heading reference system (AHRS) sensor, providing captains with a steady view in rough seas.

www.flir.com/m300-series/

ESAB 7018-1 Prime Electrodes for Cost Savings

ESAB's 7018-1 Prime low-hydrogen Stick electrodes come in a 24-lb. master carton that contains six VacPac vacuum-sealed packages. Available in all diameters from 3/32 to 5/32 in. and 14-in. lengths, VacPac features laminated, multi-layer aluminum foil that is hermetically-sealed around a strong plastic inner box. Protected by a cardboard outer box, they have unlimited shelf life and do not require special warehouse conditions.

www.esabna.com

Lumitec Digital Lighting Controls on Garmin's OneHelm

Lumitec has integrated the "Poco" Digital Lighting Control system into the Garmin OneHelm platform. Compatible with all Garmin GPSMAP 8400 and 8600 series multifunction displays, the Lumitec Poco system features an easy-to-use refined user interface. The system module utilizes the Garmin ethernet connection to provide control of all onboard Lumitec PLI enabled lighting through MFD or connected smart device via Bluetooth or WiFi.

www.garmin.com/onehelm

VRSim Virtual Reality Tool For Commercial Painting

VRSim's SimSpray 3.0, the next generation of a virtual reality paint training tool, uses HTC's VIVE Pro HMD and VIVE Trackers, and offers intuitive and true-to-life user experience by featuring enhanced visuals, trainee feedback, and the ability to simulate larger work environments. The HTC VIVE Pro enhanced optics and visuals provides SimSpray with the accurate visuals to provide a realistic and immersive experience.

www.simspray.net

Hempel's Hempaguard MaX Coating System

Hempel's new fouling defense system – Hempaguard MaX – provides vessels with a smoother hull. It reduces drag and results in significantly lower fuel requirements, and will deliver a guaranteed maximum speed loss of 1.2 percent over five years. Hempaguard MaX is applied in just three layers, meaning it can be applied more quickly, reducing time in dry dock by up to two days.

www.hempel.com

Guardian's Horizontal Lifeline for Fall Protection

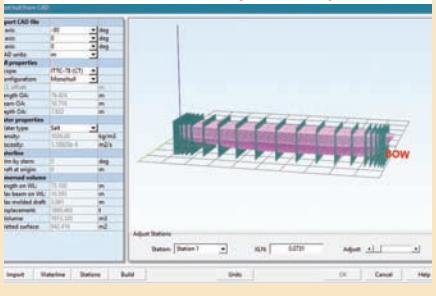
Guardian Fall Protection's HTL Horizontal Lifeline (HLL) accommodates two workers in fall arrest at 30-, 60- and 100-foot lengths. Ultra-lightweight and durable with a double-braided polyester rope, no inline shock absorber is required. Its built-in, inline tension swivel prevents tangling and keeps the HLL in optimal position. Nylon thimbles protect the rope against wear and prevents loops. The HTL's lower dynamic sag provides exceptional fall clearances.

www.puresafetygroup.com

HydroComp NavCad Software Interfaces With Orca3D

HydroComp and Orca3D LLC announced a new naval architectural tool-chain connection between Orca3D (a Rhino3D plug-in for naval architectural design) and NavCad (HydroComp's "gold standard" tool for hydrodynamic and propulsion system simulation). At the click of a menu selection in Orca3D, naval architects can evaluate their design using the complete capabilities of NavCad to reach beyond hull form analysis alone or a simplified estimate of power.

www.hydrocompinc.com



YANMAR's Multi-Function Color & Switch Panel Display

YANMAR's YD42 Multi-Function Color Display and YD25 LCD Switch Panel Display offer innovative functionality and compact style to suit a range of yachts, workboats and RIBs. Featuring a low-profile glass helm design and a 4.1-inch full color screen, the YANMAR YD42 reads and displays engine alarm and diagnostic codes. Users can view additional data ranging from speed and load, oil pressure, AIS data and more.

www.yanmarmarine.com

Miko Plasters Polar Kit

The Miko Plasters Polar Kit provides a defense against the risk of being holed by ice. The system provides for application of a magnetic patch to seal holes caused by accidental contact with hard ice as might occur in open water or drift ice. Crewmembers can close a hole sustained from above the waterline to a few meters down without endangering a diver in freezing sea conditions.

www.mikomarine.com

FLIR Introduces Raymarine DockSense Alert

FLIR Systems' Raymarine DockSense Alert is a new addition to Raymarine's intelligent docking technology line designed for a broader range of vessels. Raymarine DockSense is the marine industry's first intelligent object recognition and motion-sensing assisted docking solution. Based on this patent pending technology, DockSense Alert can be installed on any boat to help captains safely monitor their surroundings and dock their boats with confidence.

www.raymarine.com/docksense

Taylor Machine Works' Battery Electric ZLC Series

Taylor's Zero-Emissions Container Handler utilizes state-of-the-art electric motors and environmentally responsible battery chemistry. The ZLC Series is a plug-in, battery electric vehicle that allows for a smooth transition from internal combustion powered equipment. With the ability to recharge in five hours and battery capacity to complete two full work shifts with no opportunity charging required, the ZLC Series does not compromise the energy for container stacking and transportation.

www.taylorbigredforklifts.com

MarineCFO's Product Line Showcased on New Website

Schwarze-Robitec's fully electric tube bending machine, the CNC 25 E TB MR, is capable of bending tubes with diameters as small as 25mm. The system automatically checks the interaction between all axes, operates them simultaneously and prepares the next sequences. This reduces production time by 20-40 percent depending on the component and the desired tube geometry – the more complex the sequence, the more time saved.

www.schwarze-robitec.com

Wärtsilä LNG Bunkering Vessel Simulator

Wärtsilä's LNG bunkering vessel simulator provides hands-on training to those who will be operating LNG bunkering services. A recently delivered Wärtsilä TechSim LCHS Network Class simulator included a total of five work stations, namely one for the instructor and four for the trainees. The Wärtsilä LNG Bunkering Vessel simulator will enable realistic hands-on training for operators.

www.wartsila.com

Credit: Kasi Group

Sleek Carbon Fiber Cowling for Cox Powertrain's CX0300

The exceptional performance and innovative features of Cox Powertrain's high-performance diesel outboard have now been augmented with good looks following the creation of a robust, contemporary-styled carbon fiber cowling. The durable, lightweight protective housing is available in black or white. Carbon fiber also delivers impressive stiffness, strength, chemical and heat resistance, making it ideal for military and the harsh marine environment.

www.coxmarine.com

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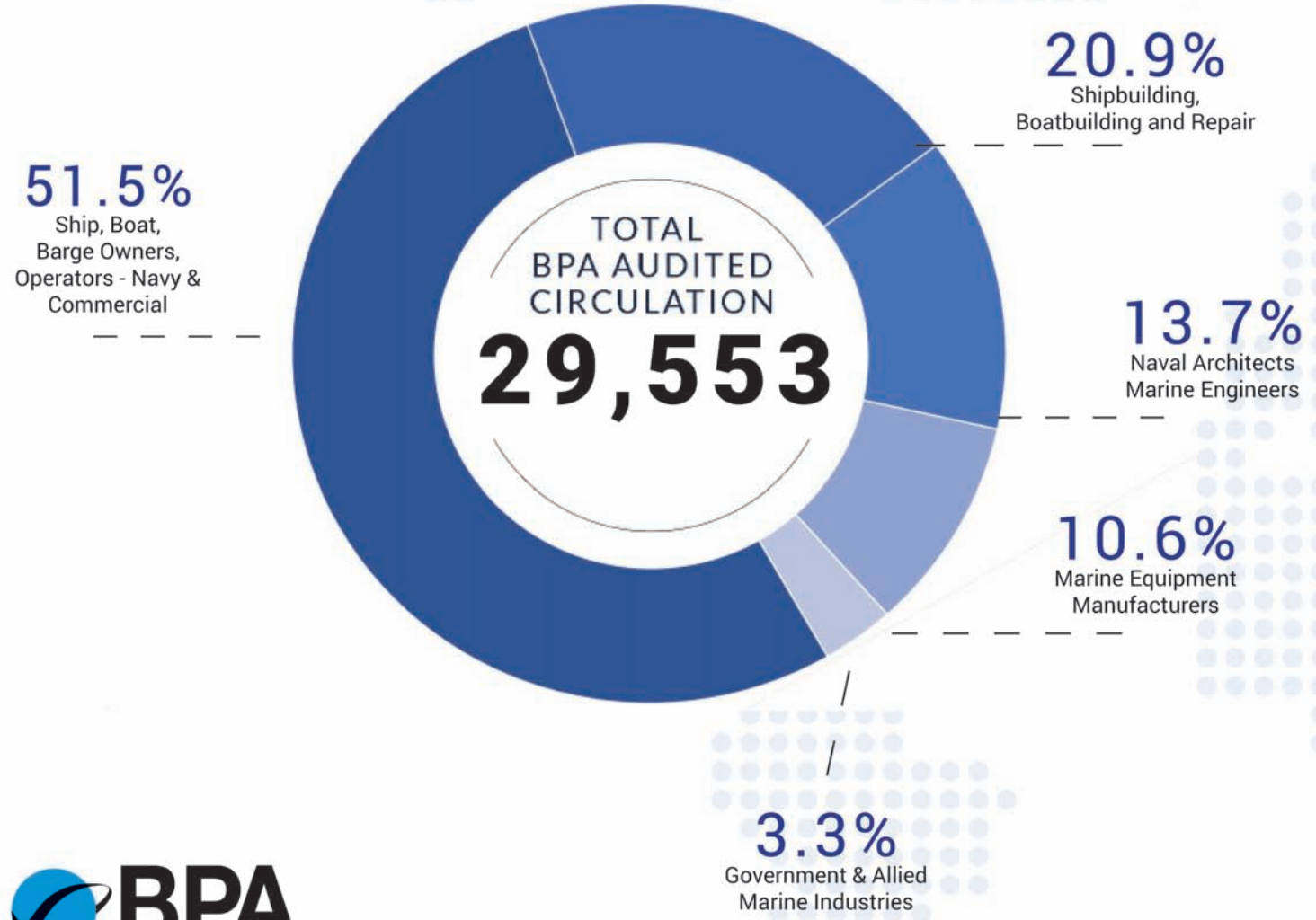

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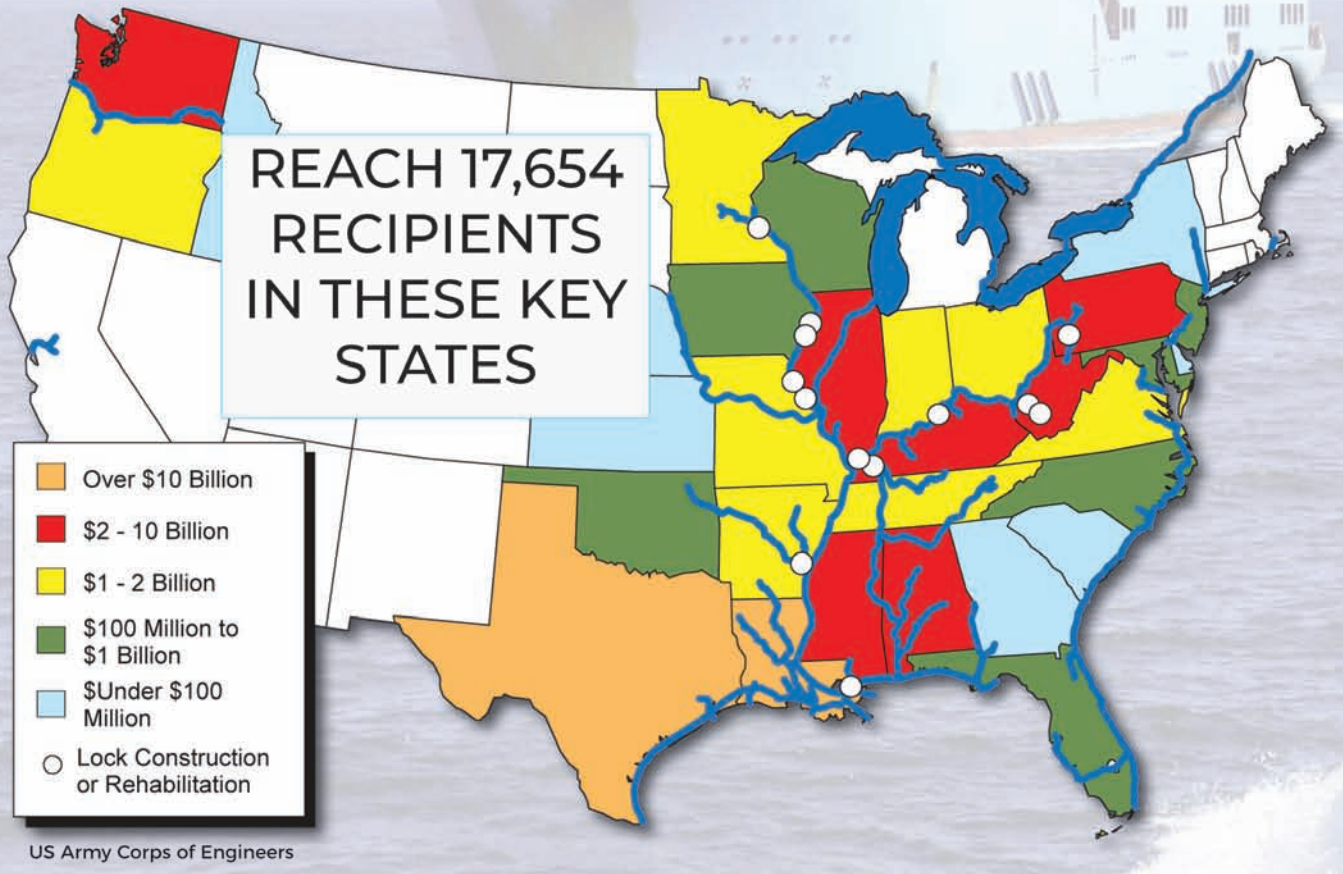
Value of Inland Waterborne Trade (by State of Origin)



US Army Corps of Engineers

New this year is the *Marine News* Quarterly Inland Waterways Market Report. These waterway reports will bring the North American inland waterway market right to you, making it a superb advertising option to directly reach a core of the *Marine News* audience.

The U.S. Coastal, Inland and Intracoastal Waterways system consisting of Waterborne cargo and associated activity contributes more than $500 billion dollars to the U.S. GDP, generates over $200 billion in annual port sector federal/state/local taxes and sustains over 10 million jobs.

Comprising 5,400 tugboats and towboats and over 31,000 barges the U.S Shallow draft market moves an average of 763 million tons of cargo on our nation's waterways each year!

Marine News

	Edition	Market	Technical	Product	Reports	Event Distribution
JANUARY (Ad Close: Dec 16)	Passenger Vessels & Ferries	Training & Education	Batteries & Electric Propulsion	Water Treatment	SPECIAL REPORT: Ferry Report: state-of-the-industry REGIONAL FOCUS: U.S. Gulf Coast	PVA Maritrends: [Feb 3-6,Tampa, FL]
FEBRUARY (Ad Close: Jan 17)	Pushboats,Tugs & Assist Vessels	ATB Report	Hull, Deck & Tank Coatings	Cordage & Wire Rope	Special Supplement **Q1 Inland Waterways Market Report**	NACE Corrosion [Mar 15-19, Houston, TX]
MARCH (Ad Close: Feb 14)	Workboat Conversion & Repair	Green Fuels & Lubricants	Deck Machinery	Pumps, Pipe & Valves	SPECIAL REPORT: Workboat Engines and Emissions Compliance Technology	CMA Shipping: [Mar 31 - Apr 2 Stamford, CT] Clean Waterways: [Apr 7-9, Indianapolis, IN]
APRIL (Ad Close: Mar 16)	Autonomous Workboats	Shipbuilding Report	Desalination Systems	Radars/Electronics	SPECIAL REPORT: Fireboats & Spill Response technology	AWO Spring Meeting: [Apr 21-23, Washington, DC]
MAY (Ad Close: Apr 16)	Inland Waterways	Barges	Barge Material Handling Equipment	Thrusters & Z-Drive	Special Supplement **Q2 Inland Waterways Market Report**	OTC: [May 4-7, Houston, TX] IMX: [May 18-20, St. Louis, MO]
JUNE (Ad Close: May 15)	Combat & Patrol Craft Annual	Multi-Mission Workboats	Outboard Engines	Stabilizers & Trim Control	SPECIAL REPORT: Workboat Comms	Seawork: [Jun 9-11, Southampton, UK] MACC: [July 15-16, Baltimore, MD]
JULY (Ad Close: Jun 15)	Propulsion Technology	Workboat Engines	Hybrid Drives	Lubricants & Fuels	SPECIAL REPORT: Training & Retention	
AUGUST (Ad Close: Jul 17)	MN 100 Market Leaders	Workboat Builders	Marine Lighting	HVAC & Ventilation	Special Supplement **Q3 Inland Waterways Market Report**	SMM [Sep 8-11, Hamburg, Germany]
SEPTEMBER (Ad Close: Aug 14)	Offshore Annual	Workboat Conversions	Naval Architecture	Dynamic Positioning	SPECIAL REPORT: Offshore Wind REGIONAL FOCUS: U.S. East Coast	SNAME [Sep 29- Oct 3, Houston, TX]
OCTOBER (Ad Close: Sep 15)	Shipbuilding & Repair	Interior Outfitting	Coatings & Corrosion	Shafts, Seals & Bearings	SPECIAL REPORT: Filtration & Water Treatment	SHIPPINGInsight: [Oct 15-17, Stamford, CT] Commercial Marine EXPO: [Oct 23-24, Providence, RI]
NOVEMBER (Ad Close: Oct 16)	Workboat Annual	Outfitting Today's Workboat	Workboat Propulsion	Deck Machinery Winches and Cranes	Special Supplement **Q4 Inland Waterways Market Report**	Clean Gulf: [Oct 27-31, San Antonio, TX] Workboat Show: [Dec 2-4, New Orleans, LA]
DECEMBER (Ad Close: Nov 16)	Innovative Boats & Products	RIB's from Fire & Patrol to Escort Craft & Offshore Wind Support	Simulation & Training	Fire & Safety	SPECIAL REPORT: Top 10 Stories for 2020	

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Editor (Name and complete mailing address)
Gregory Trauthwein, Maritime Activity Reports,118 East 25th Street, 2nd Floor, New York, NY 10010

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f. Total Distribution (Sum of 15c and e) ▶	19,536	18,518
g. Copies not Distributed (See Instructions to Publishers #4, (page #3)) ▶	42	45
h. Total (Sum of 15f and g)	19,578	18,563
i. Percent Paid and/or Requested Circulation (15c divided by 15f times 100) ▶	97%	97%

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c. Total Requested Copy Distribution (Line 15f) + Requested/Paid Electronic Copies (Line 16a) ▶	28,783	28,460
d. Percent Paid and/or Requested Circulation (Both Print & Electronic Copies) (16b divided by 16c × 100) ▶	98%	98%

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17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the issue of this publication. November 2019

18. Signature and Title of Editor, Publisher, Business Manager, or Owner: Kathleen Hickey Circulation Manager
Date: 9/18/2019

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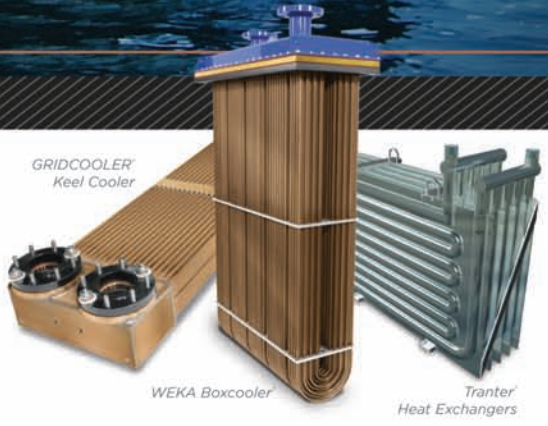

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