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Marine News

Volume 31 • Number 10

OCTOBER 2020

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Shipbuilding & Repair

Navigating stormy times and shifting markets

Shipyard Jobs
Finding skilled workers can be as hard as the job itself

Bob Merchent
One-on-one with Halter Marine's new president & CEO

Water Treatment
A look at the toughest tech

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**Source: Euroconsult, Prospects for Maritime SATCOM, 2020, market share VSAT units

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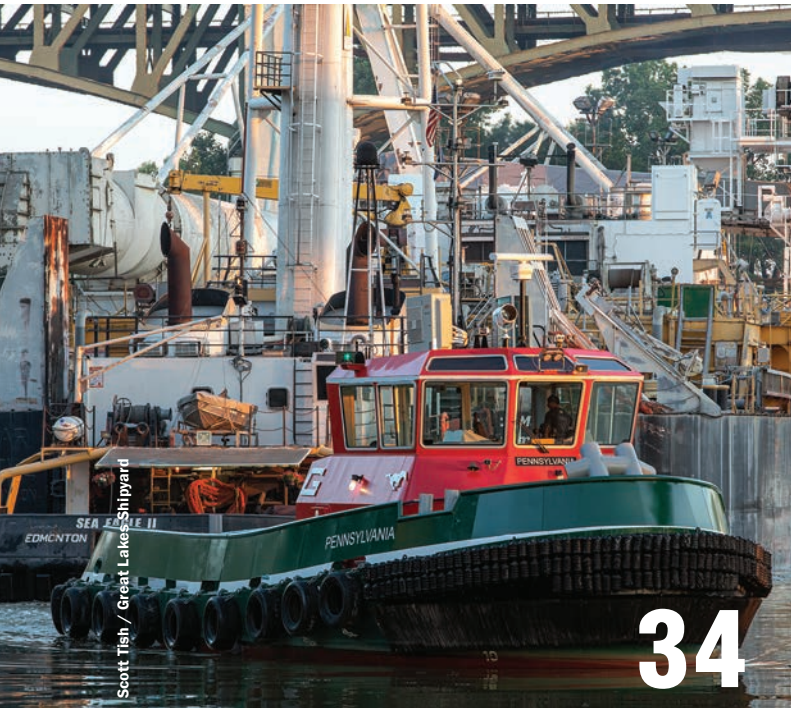

Scott Tish / Great Lakes Shipyard

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On the Cover

Halter Marine is dialing in on the government vessel market where it sees a large number of opportunities that would fit well into the Pascagoula Miss. shipyard's capabilities, says its new CEO, Bob Merchent.

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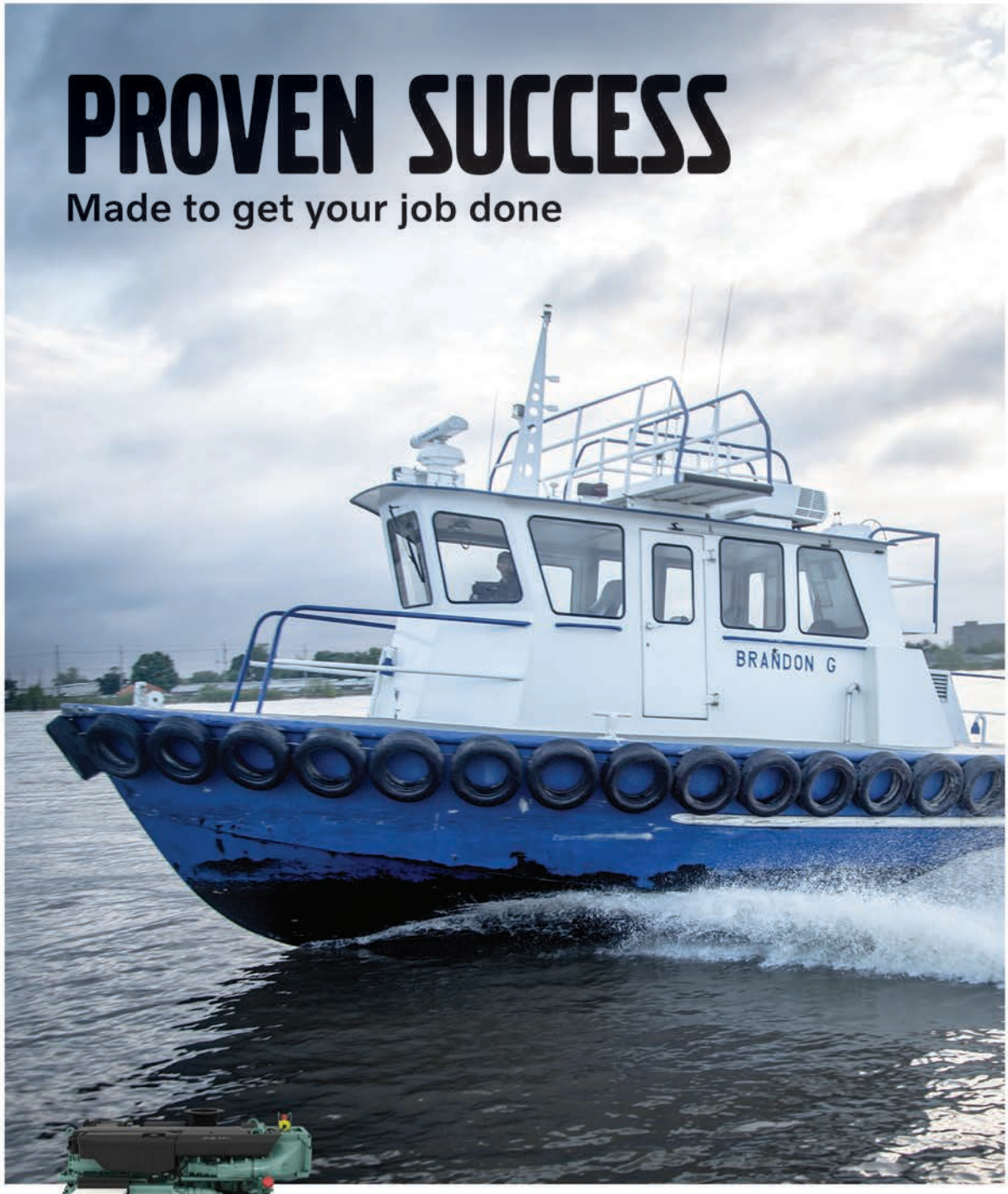

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Florida: 215 NW 3rd St., Boynton Beach, FL 33435
tel: (561) 732-4368; fax: (561) 732-6984
New York: 118 E. 25th St., New York, NY 10010
tel: (212) 477-6700; fax: (212) 254-6271
www.marinelink.com

PUBLISHER
John C. O'Malley • *jomalley@marinelink.com*

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

Editor
Eric Haun • *haun@marinelink.com*
Tel: 212-477-6700

Contributing Writers
Tom Ewing • Randy O'Neill • Barry Parker

PRODUCTION
Production & Graphics Manager
Nicole Ventimiglia • *nicole@marinelink.com*

SALES
Vice President, Sales & Marketing
Rob Howard • *howard@marinelink.com*

Advertising Sales Managers
National Sales Manager
Terry Breese • ***breese@marinelink.com***
Tel: 561-732-1185 Fax: 561-732-8414

Lucia Annunziata • ***annunziata@marinelink.com***
Tel: 212-477-6700 **ext 6240** Fax: 212-254-6271
John Cagni • ***cagni@marinelink.com***
Tel: 631-472-2715 Fax: 561-732-8063
Frank Covella • ***covella@marinelink.com***
Tel: 561-732-1659 Fax: 561-732-8063
John Constantino • ***constantino@marinelink.com***
Tel: 561-732-0312 Fax: 212-254-6271
Mike Kozlowski • ***kozlowski@marinelink.com***
Tel: 561-733-2477 Fax: 561-732-9670

Managing Director, Intl. Sales
Paul Barrett • *ieaco@aol.com*
Tel: +44 1268 711560 Fax: +44 1268 711567

CORPORATE STAFF
Manager, Marketing
Mark O'Malley • *momalley@marinelink.com*

Accounting
Esther Rothenberger • *rothenberger@marinelink.com*
Tel: 212-477-6700 **ext 6810**

Manager, Info Tech Services
Vladimir Bibik

CIRCULATION
Kathleen Hickey • *k.hickey@marinelink.com*
Tel: 212-477-6700 **ext 6320**

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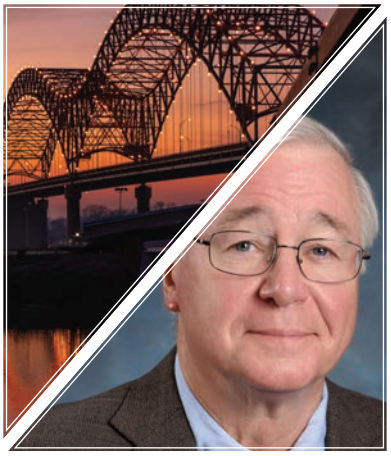

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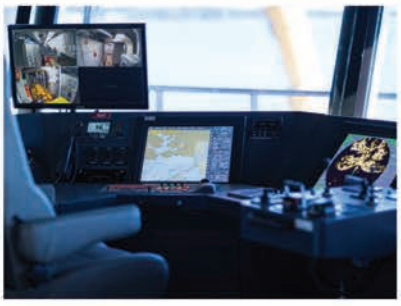

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sberthold@easternshipbuilding.com
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Authors & Contributors

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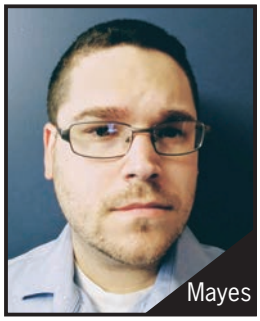
O'Neill


Haig-Brown


Parker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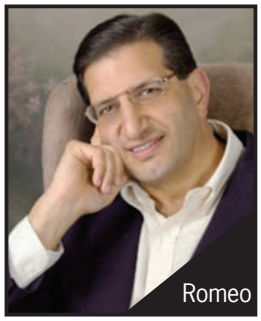
Romeo

Alan Haig-Brown began his career as a commercial fisherman on the B.C. coast and later worked on coastal freighters. He writes about commercial marine subjects worldwide and has published several books, most dealing with commercial fishing history and issues.

Terrance Mayes is a technical specialist in the coatings laboratory program at Master Painters Institute (MPI) – a division of the NACE International Institute. He has over 14 years of testing and standards experience in everything from food, metals and polymers to petrochem and paint.

Randy O'Neill is Senior Vice President with Lancer Insurance Company and has been Manager of its MOPS Marine License Insurance division since 1984. Over the past 29 years, O'Neill has spoken and written on many occasions on the importance of USCG license protection. He is a regular contributor to ***Marine News*** magazine.

Barry Parker of bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. He is a freelance writer and regular contributor to this magazine.

Jim Romeo is a marine engineer and a freelance writer focused on business and technology topics. He is based in Chesapeake, Va.


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EDITOR'S NOTE

American shipyards hold several important roles beyond simply building and servicing the vessels that help maintain U.S. national security and the vital flow of commerce. One of these roles is as an economic driver at both local and national levels. A single shipyard can provide hundreds, even thousands, of direct and indirect jobs—a function that is especially critical amid current economic uncertainty.

But the tall task of building and repairing ships has only been made more difficult with the coronavirus' arrival to American shores earlier this year. Yards have had to make significant adjustments not only to keep their workers safe and projects running, but to ensure their staffs remain employed as they strategically position themselves within shifting markets to vie for future success.

Luckily, shipbuilders are as resilient as they come. And don't take my word for it. Just ask long-tenured shipyard executive Bob Merchent, president and CEO at Halter Marine, who graciously agreed to be interviewed for this month's Insights section. "We shipbuilders are a special breed," he says. "We thrive on challenges. We have tough skin because this business demands it."

Like many U.S. shipyards, Halter Marine has its sights on a piece of the government shipbuilding pie as opportunities in commercial markets have become harder to come by. Last year, the Pascagoula, Miss. shipbuilder won the contract for the design and construction of the U.S. Coast Guard's first new Polar Security Cutter. It's a coveted award, a fantastic business opportunity and a big challenge that will keep the yard humming for years to come.

Part of the challenge is finding and retaining skilled employees to complete the work. Again, this task has only become harder due to COVID-19. Not surprisingly, Halter Marine and many other shipyards that are constantly on the lookout for qualified talent are finding ways to make it work despite new obstacles. It's just what they do.

Eric Haun, Editor, haun@marinelink.com

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2020 Small Shipyard Grants

In April, two dozen American small shipyards received a combined $19.6 million through the U.S. Department of Transportation's Maritime Administration (MARAD) Small Shipyard Grant Program, which exists to help fund upgrades and expansions that often lead to more competitive operations, quality ship construction and improved employee skill. "This $19.6 million federal government investment in the nation's small shipyards will help maintain the U.S. shipyard infrastructure of our country," U.S. Secretary of Transportation Elaine L. Chao said in a press release announcing the awards.

Since its inception in 2008, the Small Shipyard Grant Program has awarded more than $243 million through 268 grants (including ARRA (Recovery Act) funds in 2009 for $98 million and 70 grants) that have helped to modernize operations, improve efficiency, and reap the benefits of increased productivity by investing in emerging technologies and a highly skilled workforce.

Small Shipyard Grant awards by year

Year	$ Awarded	Number of Grants Awarded
2008	$9.8 million	19
2009	$17.1 million	14
2010	$14.7 million	17
2011	$9.98 million	13
2012	$9.98 million	15
2013	$9.46 million	12
2014*	$0	0
2015*	$0	0
2016	$4.9 million	9
2017	$9.8 million	18
2018	$20 million	29
2019	$19.6 million	28
2020	$19.6 million	24

*No Small Shipyard Grants were awarded in 2014 and 2015.

Eligible shipyard facilities must construct, repair or reconfigure vessels 40 feet in length or greater for commercial or government use, or construct, repair or reconfigure vessels 100 feet in length or greater for non-commercial vessels. Grants, which may not be used to construct buildings or other physical facilities or to acquire land, are capped at 75% of the project's estimated cost and are available to facilities with fewer than 1,200 production employees, and no more than 25% of the funds available are awarded to shipyard facilities in one geographic location that have more than 600 production employees.

When selecting the grant recipients, MARAD evaluates the applications on the basis of how effective the project will be in fostering efficiency, competitive operations and quality ship construction, repair and reconfiguration (for capital improvement projects) or how effective the project will be in fostering employee skills and enhancing productivity related to shipbuilding, ship repair and associated industries.

"Small shipyard grants play a significant role in supporting local communities by creating jobs for working families," Maritime Administrator Mark H. Buzby said in a statement. "These shipyards are a tangible investment in our nation's maritime infrastructure and the future of our maritime workforce."

The economic footprint of American shipyards is nearly 400,000 jobs, $25.1 billion of labor income, and $37.3 billion in GDP. Helping shipyards to upgrade and expand empowers this critical industry, allowing them to compete more effectively in a rapidly changing global marketplace. The capital provided to shipyards increases their repair and production footprints and creates more jobs throughout the country.

ALABAMA

Alabama Shipyard, LLC of Mobile, Ala., which has been serving the Gulf Coast since 1917, will receive $571,887 to upgrade four travel trucks with new assemblies on 150-ton portal crane.

Blakely BoatWorks, Inc. of Mobile Ala., a full-service shipyard focused on new construction and marine repair projects, will receive $ 379,408 for a 500-ton press brake, welding machines, overhead cranes and man lifts.

CALIFORNIA

Mare Island Dry Dock of Vallejo, Calif., which offers dry docking, ship repair and other services, will receive $1,066,326 for a 165-ton rough terrain crane.

FLORIDA

Gulf Marine Repair Corporation of Tampa, Fla., which specializes in the repair, conversion and modification of large ocean-going commercial and other vessels, will receive $692,100 for a CNC plasma cutting machine and 100-ton rough terrain crane.

GUAM

Cabras Marine Corporation, which provides pilot, tug, barge, spill response, firefighting, and ferry services in Guam and the Commonwealth of the Northern Mariana's Islands, will receive $1 million for the purchase of a 275-ton truck crane.

HAWAII

Marisco, Ltd. Of Kapolei, Hawaii, which offers ship repair and other services, will receive $745,872 for a blast and paint booth.

LOUISIANA

C&C Marine and Repair, LLC of Belle Chasse, La., which provides general steel repairs on inland barges, will receive $ 979,638 for a 275-ton crawler crane.

Cooper Consolidated, LLC of Convent, La., which provides midstream stevedoring, barge, marine, and logistics services, will receive $1.2 million for a 620-ton marine travelift.

MARYLAND

Chesapeake Shipbuilding Corp. of Salisbury, Md., which possesses more thirty years of direct industry experience and designs and builds commercial ships up to 450 feet in length, will receive $830,622 to purchase a 130-ton rough terrain crane.

MICHIGAN

Mackinac Island Ferry Company dba Mackinac Marine Service of St. Ignace, Mich., which services commercial and recreational vessels, will receive $752,933 for a travelift and welding equipment.

MISSISSIPPI

Halter Marine of Pascagoula, Miss., a company with more than 70 years of experience in ship design, construction, repair and conversion to maintenance and support, will receive $1,695,118 for a 1250-ton press brake.

NEW YORK

Smith Boys Marine Sales Inc. of North Tonowanda, N.Y., a family-owned boat service and repair company, will receive $317,641 for a transporter and CNC plasma cutter.

OHIO

The Great Lakes Towing Company of Cleveland, a company with 120 years of service on the Great Lakes, will receive $1,400,000 for an 820-ton travelift.

OREGON

WCT Marine & Construction Inc. of Astoria, Ore., which specialize in marine services, new construction, welding, boat repair, boat building and fabrications, will receive $573,075 for a big top enclosed work structure, work pad with drains, filtration system.

Diversified Marine, Inc. of Portland, Ore., which offers repair, retrofit and construction of tugs, barges and commercial steel vessels, will receive $ 1,253,160 for a 275-ton crawler crane.

PENNSYLVANIA

Philly Shipyard, Inc. of Philadelphia, a U.S. commercial shipyard constructing vessels for operation in the U.S. Jones Act market, will receive $640,158 for a Messer system.

RHODE ISLAND

J. Goodison Company, Inc. of North Kingstown, R.I., a veteran-owned small business offering a full range ship repair services, will receive $504,237 for its shipyard rough terrain crane project.

SOUTH CAROLINA

Metal Trades, Inc. of Hollywood, S.C., a family-owned business since 1962 with experience in heavy steel fabrication, manufacturing, machining, vessel construction and vessel maintenance and repair, will receive $492,128 for a 55-ton Grove all terrain crane and three Skytrak telehandlers forklifts.

TEXAS

Gulf Copper Ship Repair, Inc. of Corpus Christi, Texas, an employee-owned company noted for installing copper piping on marine vessels, will receive $423,186 for a 110-ton crane.

Bludworth Marine, LLC of Houston, which services ships, ATBs, inland and offshore tugs and barges, and other vessels, will receive $1,337,468 for a 275-ton crawler crane.

VIRGINIA

Colonna's Shipyard, Inc. Norfolk, Va., which performs ship repair, machining and steel fabrication services to both the commercial and government markets. will receive $799,996 to purchase welding machines.

WASHINGTON

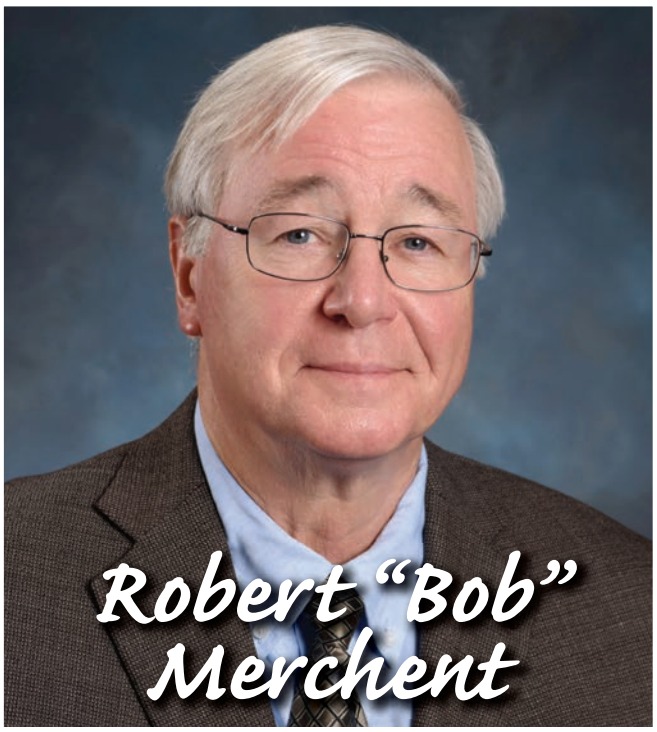
SAFE Boats International, L.L.C. of Bremerton, Wash., an aluminum boat manufacturer and leading supplier to military, federal, state and local law enforcement, fire and rescue agencies, will receive $587,035 for a router and press brake.

Mavrik Marine Inc. of La Conner, Wash., which specialized in the construction of aluminum work boats, will receive $564,850 for a bridge crane, welding system, and compressor.

WISCONSIN

Fraser Shipyards, Inc. of Superior, Wis., which offers services from emergency repairs to brand-new craft to large industrial fabrications, will receive $793,162 for overhead material handling and steel brake processing improvement.

Halter Marine



All photos: Halter Marine

Robert "Bob" Merchent

President and CEO, Halter Marine

Please describe your professional background and what attracted you to your current position.

In June 2020, I was named president and chief executive officer of Halter Marine. I had been retired around six years. My wife and I bought a piece of property outside of Brookhaven, Miss., and we were enjoying retired life split between our country property and our home in Gautier, Miss. Earlier this year, I was asked if I would consider a consulting role for Halter Marine, which led to my eventual position as CEO.

I have a Bachelor's of Science degree in business management from the University of Southern Mississippi, as well as certificates on executive leadership from the Harvard Business School, executive finance from the Wharton School of Business and executive marketing from the University of Maryland.

I spent most of my career at Ingalls Shipbuilding, leading programs critical to both the business and the U.S. Navy and Coast Guard. Ingalls is an exceptional shipyard building major surface combatants, amphibious assault ships and Coast Guard cutters for the government. Ingalls is true national asset. My time there culminated in the role as the Vice President, Surface Combatants, Fleet Services and U.S. Coast Guard Programs. It's because of my extensive experience with Coast Guard programs that I was both attracted to the role at Halter Marine and perhaps why I was asked to join the company. During my time at Ingalls working on the National Security Cutter program, I observed several U.S. Coast Guard commandants state how important our icebreakers were to our national strategy. The fact remains that the few ice breakers we have in service today are way beyond the end of their planned service life. And our nation is incurring exorbitant costs keeping these few assets operational. The bottom line is our nation sorely needs a fleet of new icebreakers in order to fulfill the missions levied on our U.S.

Coast Guard team today. The new Polar Security Cutter's mission is to maintain defense readiness in the Arctic and Antarctic regions; enforce treaties and other laws needed to safeguard both industry and the environment; provide ports, waterways and coastal security; and provide logistical support – including vessel escort – to facilitate the movement of goods and personnel necessary to support scientific research, commerce, national security activities and maritime safety.

This is the main reason I took on this job. So, I am delighted to be here at Halter Marine. We have an outstanding team of folks who are just as excited as I am to be responsible for the detail design and construction of the next fleet of Polar Security Cutters.

What is your top goal as Halter Marine's new CEO, and what's being done to achieve it?

Halter Marine has a wonderfully storied legacy and an excellent reputation for shipbuilding. We have served our nation faithfully over the years by designing and constructing government and commercial ships, and we are proudly building on that reputation. I want to see Halter Marine excel as a strong Tier 2 shipbuilder, contributing to our nation's defense and security. To get there, we are leveraging our existing capabilities, realigning our organization, improving our business processes and expanding our technology and training. The government requires that we comply with a number of new standards and business processes as part of our Polar Security Cutter (PSC) contract. As a result, many of the changes we are making today will ensure we meet these new requirements.

There has been a great deal of interest in the Polar Security Cutter. We won this contract last year, and we are in the process of designing the vessel and preparing for the start of construction of this highly specialized and unique ship. This program takes advantage of our deepwater facilities, our experience with diesel electric propulsion systems, our ability to build complex vessels and extensive experience in reducing lifecycle operating costs through optimal design.

Halter Marine is known worldwide for our capability to fabricate and assemble steel vessels extremely efficiently. The Polar Security Cutter will enable us to add yet another unique and specialized capability to our shipyard: the ability to cut and form extremely thick and high tensile steel into units that will ultimately become the finished vessel. We are conducting a pilot program under a special study to develop efficient processes in the cutting and welding of the specialized steel that will be used in the construction of the vessel. These early activities allow Halter Marine to gain knowledge, demonstrate capabilities and mitigate risks well before the actual start of construction.

As we prepare for construction of the PSC, we are also bringing in new technologies such as robotic welding machines and a PythonX, which will increase our steel cutting capacity and expertise. Bringing in high-tech tools such as these ensures that we will be ready when construction begins late next year. Additionally, our entire build position, translation and launch process is being overhauled and upgraded to handle the extreme weight of the Polar Security Cutter. The footprint of the keel area highly loads our ship erection and launch facility that demands significant upgrades to their foundations, all the way down to bedrock.

In addition to the equipment and facilities, we are also investing in our workforce. To help develop our future workforce, we have just implemented a U.S. Department of Labor-approved, four-year apprenticeship program and our first group consists of 50 people across five crafts. Constructing the PSC requires that we double our workforce in the coming months, so we are training talented and capable men and women today to be part of that skilled labor force. As a large, multi-year program, the PSC makes us more attractive to future employees and equally important, it will help us retain the highly trained workforce we have today.

What do you count as your greatest challenge, and what's being done to address it?

Halter Marine is currently in the middle of what is called the functional design phase for the PSC. This is where we do all the ship systems integration. We have 13 major teammates who provide both technical and material components that make up the vessel. Many of them are located overseas. The functional design process involves a series of concurrent technical and programmatic activities across all these major teammates. Communication across this enterprise is paramount in order to be successful in this phase of design. The process associated with the design of a new

vessel is a challenge by itself. But doing this under the constraints introduced by COVID-19 has made it particularly challenging. However, our team has leveraged technology to the fullest extent we can and we have improved our processes to minimize the impacts of COVID. We, along with our Navy and Coast Guard teammates are working side-by-side to overcome the adverse impacts of COVID, protect our workforce and customers and ensure we continue to make progress in spite of these many challenges.

Of course, strengthening and increasing our skilled labor force for the PSC is both a blessing and a challenge. That's why we teamed up with the Mississippi Gulf Coast Community College to create our apprenticeship program. It offers training in the craft labor fields of welding, ship fitting, pipe fitting, pipe welding and electrical. It is designed in three components: on-the-job training, classroom training and a progressive wage increase as participants reach set milestones. Ten students are enrolled in each of the five disciplines for a total of 50 apprentices. We are off to a very good start.

They are following a maritime technology curriculum approved by the Department of Labor and the Mississippi Community College Board. The curriculum is comprised of 10 to 12 classes in support of their craft, plus management/leadership classes. I'm very excited to see this first class of apprentices. Future shipyard leaders often begin their careers through apprentice programs, so we likely now have a future vice president or even a CEO in this class.

You took over as Halter Marine's CEO at an interesting time, to say the least. You mentioned COVID-19's impacts on the PSC program, but how has the pandemic materially impacted your overall business to date?

It is, indeed, an interesting time. Halter Marine had a well-established COVID protocol in place before I started. In March, we created a COVID-response team of executives and managers. Immediately, this team implemented a number of initiatives to protect our workforce, customers and partners. Some of the things we are doing include temperature checks at our entrances and workspace changes to reduce the chance of transmission of the virus. We purchased a barrel of locally produced hand sanitizer, which we gave out to employees as well as placed spray bottles at all building entrances. Every night we have a crew go through all our facilities and fog the work areas with antiviral mist. These and other measures such as travel restrictions and social distancing helped us keep our numbers incredibly low through the first half of the year. As we moved into summer, we experienced

an increase in our caseload, which resulted in a higher than normal absentee rate. Historically, we enjoy a 3-4% absentee rate; that number increased to 20+% during the early summer months. Happily, we have recovered to near our normal rate, and our caseload has not continued to climb.

We are keeping our yards open and adhering to the various measures such as social distancing to keep our employees safe. We continue to stay vigilant and remain focused in delivering our existing contracts.

Please give a brief overview of Halter Marine's current order book. How much capacity exists to take on additional projects?

It's an exciting time in our shipyard right now. We are in various phases of construction on the U.S. Navy's Auxiliary Personnel Lighter–Small program. We will deliver the first two APLs early next year, and the third vessel is due to be delivered after that. Construction on the fourth APL should be complete next summer. Currently, we have two Landing Craft Support vessels under construction, and we are completing the first 4,000-cubic-meter liquefied natural gas (LNG) bunkering tug/barge unit. These are all important programs. Finally, the Polar Security Cutter program will provide Halter Marine the needed base of work that will keep us viable for years to come.

We are also involved in six different studies with the government. For example, we received the Navy's $981,000 industrial study contract for the T-AGOS class series of vessels. These ultimately will replace the existing fleet of four T-AGOS-19 and one T-AGOS-23 small waterplane area twin hull ships.

And we are also working on studies for CHAMPS, LAW, LUSV and OPC programs.

As we move into 2021, we are preparing for PSC construction and erection, but we still have plenty of capacity for additional design and construction jobs and are actively pursuing these equally important programs.

How do current business opportunities compare in the commercial vs government sectors, and where is Halter Marine focusing its efforts?

Our current order book is all government as the commercial market is slow at this time. We're currently focusing on the government market where we see a large number of programs being worked on or considered that fit well into Halter Marine's capabilities.

In addition to the several areas you mentioned previously, how is Halter Marine investing today to ensure future success?

I've touched on our investment in facilities and technology and how we are training people. There is one key element to this equation that deserves full attention: safety.

This spring, Halter Marine received the 2019 Safety Award from the American Equity Underwriters. I'm so proud that we are one of 25 companies to receive this prestigious safety award. It is based on very specific, measurable data, and it's a tough competition. We have a strong safety culture here at Halter Marine, and I'm proud of the attention to health and safety demonstrated by our team every day. It truly has been an all-hands effort.

What are some of the most impactful changes you've observed in the shipbuilding business over the course of your career? What sort of changes do you expect we'll see in the years ahead?

Perhaps the most impactful change our industry has seen over the years is the increase in automation on both commercial and government vessels. Trends in technology during the past several decades has been tremendous. Particularly in the area of automation. Sensor technology, information and systems control and monitoring capability, improvements in the bandwidth of data streaming through transitioning from serial to fiber optics to name just a few. All of this technology has introduced the capability to reduce manning aboard vessels, improve the ability to manage propulsion and machinery conditions and predict with certain accuracy the need for machinery and equipment overhaul and repair. These trends add great value to the owners because the technology enables improvements in operational availability and extends the potential service life of the platforms we build.

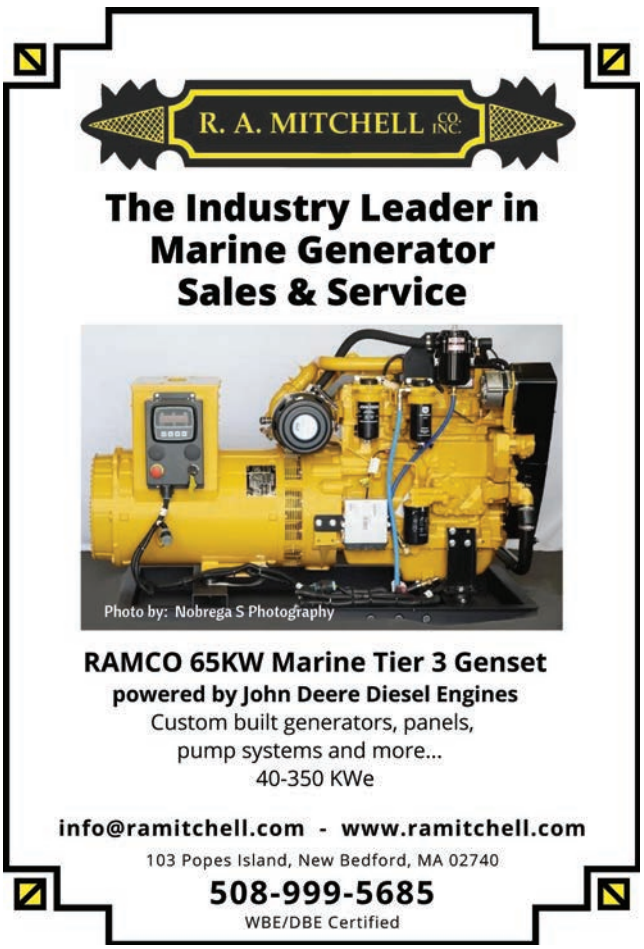
The introduction of this capability has led to a huge upswing in automation of all shipboard systems. And that has driven the costs of these vessels proportionately.

The resulting increase in upfront costs of employing these systems can sometimes be difficult to swallow for our customers. We have experienced cases where a customer will use "historical" information from previous or similar platforms to establish an expected price for a new vessel they desire. But they often times overlook the fact that the vendors selling systems and components are staying with the times by introducing these new automation features in their products. That drives up the costs for the equipment and systems. And it also drives up the shipbuilder's costs because it requires more cables to connect and integrate these systems aboard the vessels. The costs associated with the systems engineering, functional and detail design as well as the planning and production time, test and commissioning efforts increase as well. Adding complexity and capability to platforms introduces risk, especially on first of class designs.

Another trend we have seen over the decades is the unwillingness of some customers to share in program risks. As a new program is introduced, the entire value stream is fraught with risk. Risk that has to be recognized, captured and monetized and factored into the overall program plan. Risks are captured and various risk mitigation activities are assigned. These risks are linked to the program plans and schedules and are tied to the financials. When done right, most risks are defined during the program pricing process and before the start of negotiations. What the shipbuilders would like to see is more sharing of the risks. If our customers, who clearly acknowledge the risks, would share in some of the risks, the resulting costs of programs would go down.

Affordability will remain a key discriminator in terms of competition. All shipyards are keenly aware of this. It drives our business decisions because it is directly linked to our ability to win new business. Every shipyard has a "viability" line drawn that balances the costs of the business against the revenue stream of the programs. If it is all in balance, life is good. If it is not, not so good.

We shipbuilders are a special breed. We thrive on challenges. We have tough skin because this business demands it. There is no other business that I am aware of that has so many moving parts that have to be known, and paid attention to from start to finish. The typical construction window from design through construction and delivery can take three to five years involving some 80-plus different professional and trade disciplines, all of which has to come together culminating in a finished product we all can be proud to have been a part of. That is what motivates me. That is what motivates our team here at Halter Marine.



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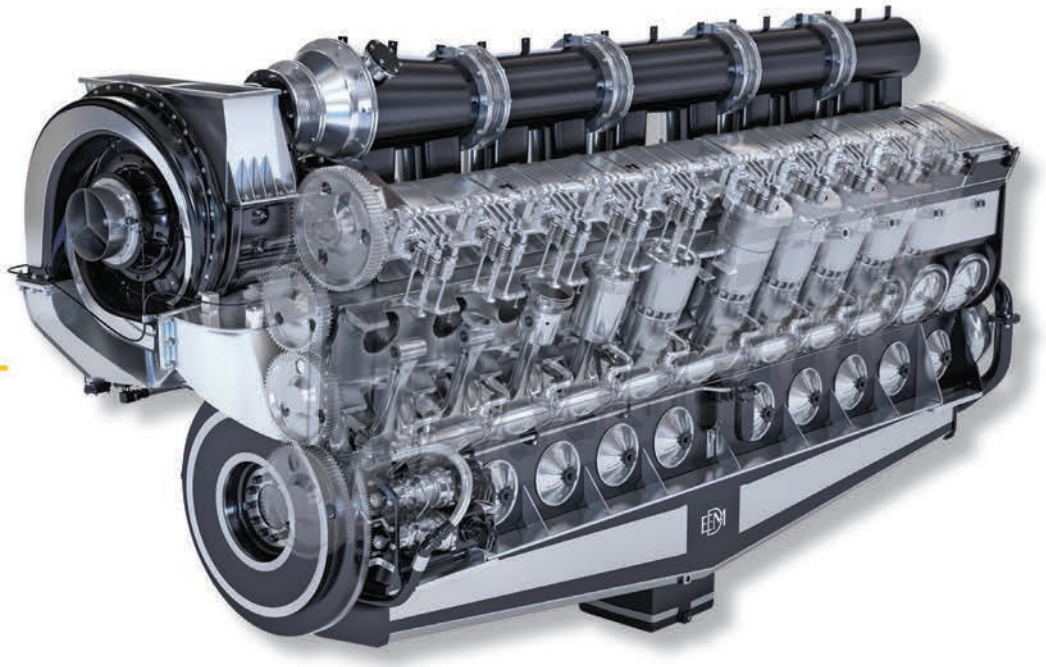

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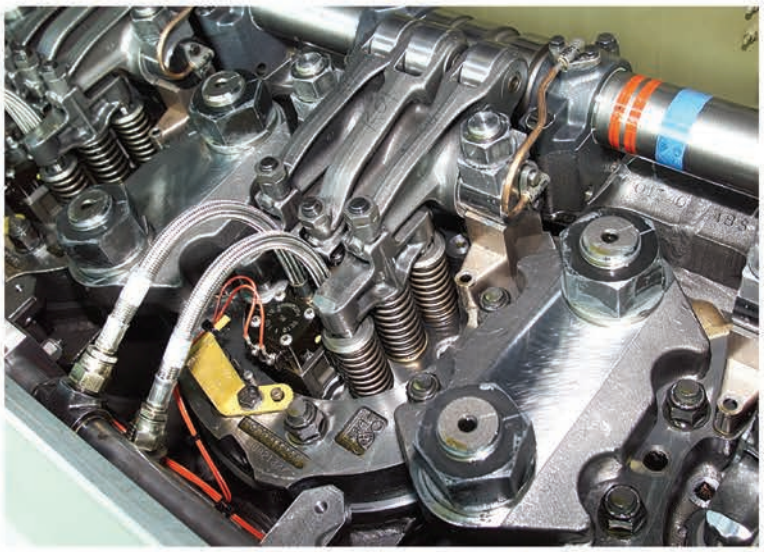

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"Your true pilot cares nothing about anything on earth but the river, and the pride in his occupation surpasses the pride of kings." -Mark Twain, Life on the Mississippi (1883).

That statement made by the great chronicler and river pilot over 137 years ago is arguably as true today as it was then. But what has changed dramatically in the almost century and a half since then is the variety and complexity of the daily challenges that river pilots confront on our increasingly busy inland waterways. The sophistication of locks, dams and bridges, the unpredictable fluctuations in water levels and the consequences to those who fail to factor in all of the above when planning their commercial river trips can be costly career killers.

Even in Twain's day, one key concern of any experienced river pilot was the depth, width and height of not only his vessel, but, as importantly, whatever that vessel was pushing or pulling. While those measurements were a constant for his vessel, the variances of the sizes of that day's job were unpredictable. And, while water levels change and navigable channels widen and narrow, bridge heights don't. It's up to the pilot to make adjustments to his calculations and safety margins according to that day's river conditions. If that isn't done, the potential consequence of a bridge allision could be the beginning of a very long and difficult battle to defend his pilot's license, career on the river and professional reputation.

The case highlighted here is not at all unusual in the set of facts and, sadly, in its outcome as well.

A lapse in judgement

In late fall, our pilot was serving onboard a towboat on a Midwest river and towing astern a 50- by 50-foot flexifloat spud barge. On board the barge was a deckhand and two observers. The workboat pilot had towed several flexifloat barges previously, but it was his first time towing this specific flexifloat spud barge. The trouble truly began when he eye-balled the spud height above the water level to be 35 feet. Unfortunately, he did not directly measure the spud height, inquire about the exact height or go onboard the barge to check the height himself. What made matters worse, was the fact that these particular spuds could be positioned either all the way up or all the way down. Ominously, the spuds were in the full up position.

The captain commenced what was planned to be a four-mile transit route requiring passage under a vertical lift railroad bridge. The bridge, which had a vertical clearance of 35 feet when down and 135 feet when raised, was manned 24/7 and the operator could raise it partially or completely depending on the circumstances and communications received from approaching vessels via marine radio.

Seeing that the bridge was in the down position as he approached, the pilot judged that "he could make it under the bridge without problems." It was daylight, weather conditions were favorable with an ebb current and 4 nautical miles visibility.

The towboat passed under the railroad bridge, but as the flexifloat spud barge being towed astern was proceeding underneath the bridge, the spuds on the barge came in contact with the lower railroad steel beam of the bridge, resulting in damages to the spuds and, possibly, the bridge.

Following the allision and as the shaken pilot was assessing damage to the barge and attending to other potential onboard safety issues like flooding and pollution, the railroad bridge operator immediately reported the incident to the local Coast Guard station prompting the on-duty USCG safety officer to contact the pilot for confirmation that his tow had indeed struck the bridge. The pilot confirmed the allision with the bridge and reported that the lower two bolts of the forward spud well bent over and the aft spud well's upper bolts broke, causing the aft spud and well to bend backwards. He further reported no damage to his vessel or, to the best of his knowledge the railroad bridge.

An open & shut case

After his conversation with the Coast Guard officer, the pilot reported the incident to his license insurer and was

By Randy O'Neill

immediately assigned a local maritime attorney who assisted him in the completion and submission of the Marine Casualty Report (2692) and subsequently accompanied the river pilot to his in-person Coast Guard interview.

The meeting was brief. The pilot was charged with negligence for both failing to check and verifying the height/draft of the barge's spuds, and failing to request the operator to raise the bridge to facilitate safe passage. He was offered a settlement agreement of an outright three-month license suspension with an additional nine-month probationary period following the completion of his 'beach' time.

After debating the merits of contesting the terms of the settlement offer, both he and his attorney agreed that, given the absence of mitigating circumstances, the most prudent, yet painful, decision was to accept the suspension with probation offer.

Because he had opted for income protection when purchasing his license insurance policy, the pilot received his insured wages for the duration of his suspension, but no amount of money could compensate the hit to his professional reputation caused by two egregious lapses in judgement: not verifying the spud's height and/or not requesting the bridge to be raised.

Because this column opened with an upbeat quote from Mark Twain, it's only fitting that we end it by going back a few millennia to ancient Greece and the sobering, yet cautionary, words of the tragedian Sophocles who wrote, "Men of ill judgement oft ignore the good that lies within their hands, till they have lost it."

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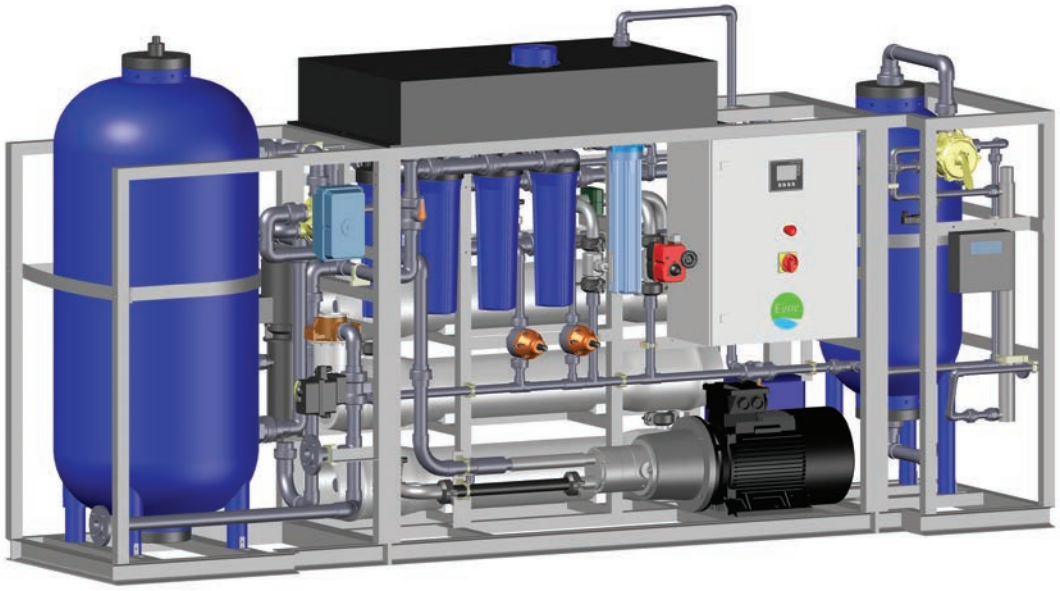

Reverse Osmosis and the New Dawn of Marine Desalination

By Jim Romeo

Today's desalination plants are rugged, durable and highly automated to meet the demands of operators and the crew, enabling them to meet schedule and mission with ample potable water production.

In the days of old, marine distilling plants – then mostly steam – relied on archaic flash evaporators, which used steam to heat, power an air ejector, and ultimately create a vacuum whereby seawater would flash or boil and ultimately be distilled. The process would often occur over two stages and what did not flash would be pumped overboard as brine. Times have changed. So has the associated equipment with more efficient equipment that's easier to operate and maintain.

Marine evaporator plants which had used steam, built up scale easily. They were subject to steam flow, temperatures and pressures which lead to high maintenance. They incorporated several pumps, alarms, dump valves, sight glass indicators and were prone to many reliability and performance challenges. Plus, they were labor intensive, often requiring a watch stander to dedicate much time to their operation, being careful to fill appropriate tanks, have careful vale alignment, and ensure that all heat exchangers within the system were working.

They also required extensive periodic maintenance and were somewhat cumbersome. This has all changed with the emergence of reverse osmosis and desalination vessels on modern marine and offshore vessels. The new technology is a critical link in a vessel's ability to operate and provide a self-sufficient source of fresh and potable water for the crew and any other applications that might require fresh water.

The new dawn of reverse osmosis

Jeffrey Lum, is a sales and account manager for EVAC, a leading provider of integrated water and waste management systems for the marine, offshore and building industries in South Florida.

"The evaporator was the most common way of securing water during transit," says Jeff Lum. "But with the new trend of slow-steaming, and the reduction of power for diesel-electric vessels, it [the ship] becomes more of a consumer than a benefit." With the evolution of reverse osmosis units being implemented, shipboard, the equipment's

All photos: FCI Watermakers

economy and overall efficiency was improved.

"The energy required to start the evaporator is costly," adds Lum. "The reverse osmosis plants were created as a better and more efficient alternative and have been pretty standard since the mid '90s."

In actuality, potable water produced by reverse osmosis (RO) is a consummate form of water treatment. It is filtered by membranes, down to the micron level, and provides the purest of water.

"The osmosis process is liquid diffusion through a membrane," says Lum. " If we have two buckets, one with fresh water and the other with saltwater and connect both with a membrane, the natural process would be that the fresh will migrate the salt side. The reverse process is that we insert pressure in the saltwater side, forcing it to the fresh side while the salt residues remain in the membrane. The permeate water after the process is so pure that it needs to be processed with minerals so it can be consumed. The end quality product is much better than what we drink from our residential faucets."

Lum says that in the new build segment, where the specs have been rewritten to be more efficient. "The RO plants are installed since this period," he says. "But in the refit [or retrofit] segment [of the marine market], there is a common trend to either install more units, revamp older plants and replace evaporators with RO's."

Scott McGuire is president of FCI Watermakers based in West Valley, Utah. FCI Watermakers is a leading manufacturer of desalination plants for the marine and offshore industry. He says today's desalination RO plants are highly automated, with the operator in mind.

Automation for operation

"We've moved away from anything that really has any type of manual interface," explains McGuire. "It's all automated now. It's one touch operation. All the pressures come up automatically. All your settings will adjust automatically, based upon the water you're running in. We've eliminated the end user, or the indicator, from the process so that they no longer have to worry about turning the machine on the pressure and then coming back and monitoring it all the time."

McGuire points out that the automation was driven by the change in operators. Shipboard engineers go from ship to ship and often don't have time to learn a new system or get deeply involved with the systems. "Our attempt at automation was to make it as simple for the user, no matter who that user is and what their skill set was, to operate these machines," he says. "We've even eliminated belts and pulleys and anything that has to do with it." He acknowledges that older units have more mechanical parts and it becomes a maintenance item, as belt and pulley drives may get out of adjustment. "It's all direct drive now," he says. "With gearbox, reduction gears, or even direct coupled-depending upon the size of the system, to them by controlling the speeds of the motors."

Durable and reliable high-pressure pumps

For RO units and desalination plants on one skid, very durable, and rugged high-pressure pumps are required. McGuire says he's seen the gamut of high-pressure pump manufacturers and features.

There once were bronze and brass pumps used. Then nickel aluminum bronze pumps came along - without great results. Then there were radial axle pumps that did not require oil. But, as McGuire explains, the best high-pressure pumps he found were those made from 316 stainless steel as it had the best performance and the greatest durability and has been FCI Watermakers' choice in high-pressure pumps.

316 stainless steel is ideally suited for marine and saltwater applications and is the required material for the service these pumps endure, and the critical function they perform, in a very important shipboard system.

Aftermarket support

A common issue with desalination plants is parts replacement, or more specifically, membrane replacement. The RO membrane does not last forever. Periodically it needs to be replaced. Acquiring a replacement membrane becomes problematic because not all membranes are suitable for a particular unit. Very often, a ship may order a membrane in a foreign port or a remote location, and it is an unsuitable membrane that becomes a bad performing membrane.

As McGuire explains, often a Chief Engineer or ship owners needs to replace a membrane and connects with their local ship chandlery, or their local vendor. They replace it with an off-spec membrane, put it in, and it's not designed for the normal operating pressure, gallons of output, or that desalination plant design.

"And so, they don't perform correctly," says McGuire. "Stick with the membranes that are specified on the machine, because they're designed for that machine.

"We can resupply from any number of distributors we have around the world or they can call us directly," explains McGuire. "We stock hundreds of membranes. And we'll always have stock of membranes. We can get them to you wherever you are"

But he cautions about having stagnant membranes in inventory. "Because membranes usually have a shelf life of a year, some dealers don't like to put them on a shelf because it just sits there and then it might go bad on them. So, often they will just deploy directly from us."

Proper operation and maintenance

Another point of design for FCI Watermaker operation is the inclusion of automatic freshwater washes periodically. "Every time that machine turns off, the system flushed itself with fresh water," he says. "So, the membranes, the filters, the high-pressure pumps, all that are sitting in salt water for the long duration." He says they have allowed

their automation to be programmed to automatically flush the system with fresh water, if it goes into lay up for a period of time or will be idle for a prolonged period of time.

McGuire says that with timely, scheduled maintenance, and prompt replacement of consumable parts on the plant such as seals, wearing rings, membranes, and any other necessary parts, the system can las the life of the ship. "You could feasibly build a ship tomorrow and with proper maintenance, proper backflow, proper flushing, and periodic replacement of certain parts, it should last.

"We have systems that are still running from the first systems that we ever put out there," he says, "It's a matter of replacing the consumables, keeping up on the maintenance of the system. So, you can keep this thing going for as long as you want to keep replacing parts."

Keeping desalination plants is a critical link in shipboard operation. The availability of fresh water for the crew is a determinant factor in the vessel maintaining its mission and staying on schedule. This becomes very important if a vessel is unable to take on potable water along its voyage or must operate for long stretches of time. Desalination plants, operating properly, with the right maintenance and equipment, are crucial to smooth and efficient marine engineering.

"Water is becoming somewhat of a commodity," says Lum. "In the cruise segment, we see that the passengers are utilizing more freshwater every year, but there is a lot of waste as well. Black and grey water process should be one of the topics shortly as a lot could be re-utilized as technical water."

US Shipyards See Big Business Shifts

Eastern Shipbuilding Group

By Barry Parker

Metal Shark delivered its first towboat for Florida Marine Transporters.

Metal Shark

The second of three vessels for New York City's Staten Island Ferry was launched by Eastern Shipbuilding this summer.

The American shipbuilding scene, filled with participants constructing all manner of vessels, has been navigating through stormy times (lately, yards along the Gulf Coast have literally been dealing with storms). The orders for newbuild, repair and conversion projects continue to flow in—albeit at a reduced pace—and the boats and ships go down the ways into the water, but the overall panorama has seen tremendous sea changes as the business has shifted.

Maritime businesses worldwide have been grappling with currents both internal and external. Across the entire landscape in 2020, the COVID-19 pandemic has brought about operational changes that will continue into the future, long after Americans are vaccinated. Most U.S. shipyards were identified early on as "essential businesses", and therefore continued working throughout 2020. The proactive attitude of one yard during 2020's pandemic did not go unnoticed, with Fincantieri Bay Shipbuilding (FBS) receiving the Northeast Wisconsin Service Award. As explained in a press release from FBS, "The award honors the unsung heroes of the coronavirus who helped keep Wisconsin moving while the state was shut down. Honorees are selected for going above and beyond the call of duty in their respective fields or industries."

Throughout the maritime world, again reflecting broader trends, talk has turned to "decarbonization" (with reduced CO_2 going beyond notions of simply improving vessel efficiency), which will have profound implications for vessel propulsion and fuel choices. Initially, this trend has driven a movement toward liquefied natural gas (LNG) fueled propulsion. In Pascagoula, Miss., the Halter Marine yard will soon be completing the tug barge combination Q-Ocean Service / Q-LNG 4000, for Q-LNG. The 4,000 cubic meter unit will be contracted to Shell, and will be handling both ship-to-ship and ship-to-shore transfers of LNG to vessels and to shoreside LNG distribution depots.

Indicative of the currents, FBS, in Sturgeon Bay, Wis., held a modern day "keel laying ceremony" (with pre-constructed modules laid in place), in late June, for an LNG bunker barge, Clean Canaveral, that will provide fuel to shipping customers of NorthStar Midstream (tied to private investor Oaktree Capital), along the U.S. East Coast, out of Jacksonville. The 5,400 cubic meter articulated tug barge (ATB) unit will be owned by a new entity, Polaris New Energy, which has options on two additional units.

With its Great Lakes location, FBS is also building a 28,000 dwt. self unloading bulk carrier for Interlake Steamship, and delivered the dry bulk barge Michigan Trader to Van Enkevort Tug and Barge in August.

Along the Gulf Coast, Eastern Shipbuilding- Panama City, Fla. has also been active in multiple segments. The yard is in the midst of a three-vessel order for New York City's Staten Island Ferry. The first of the 4,500-passenger trio, Sgt Michael Ollis, is set to be delivered in late 2020 (after being delayed due to Hurricane Michael in 2018), with a second vessel, Sandy Ground, launched in June 2020. The yard has continued to work, in the midst of the pandemic and an active hurricane season. In August, Eastern, which had previously been a prodigious producer of tugboats, delivered the 5,100 hp Z-drive ship-handling tug A. Thomas Higgins to E.N. Bisso (following up on a sister vessel C.D. White delivered earlier in the year).

Also in the Gulf, the Metal Shark facilities, encompassing three locations in Louisiana and Alabama, have been active, with a varied construction slate. The Bayou La Batre, Ala. facility (previously the Horizon Shipyard) recently delivered a 6,000 hp boat to Florida Marine Transporters (FMT), the first of a three boat order, and the yard's first towboat for the inland marketplace. The Metal Shark yards have also continued to deliver ferries to NYC Ferry (in New York) and to Potomac Water Taxi, in the Washington, D.C. area. Metal Shark, also a prolific builder of fast boats for law enforcement and for military users, credits "series production" to its ability to deliver vessels rapidly and at scale, at a time that cities such as New York seek to

move commuters from automobiles onto ferries.

A different sort of environmental theme (against a backdrop of increased funding for dredging) is evidenced most recently with Eastern Shipbuilding beginning construction on a second new 8,550-cubic-yard trailing suction hopper dredge for Weeks Marine Inc. (with a previous unit delivered in 2017). Elsewhere, Conrad Shipyard is building a 6,500-cubic-yard TSHD for Great Lakes Dredge & Dock Corporation. And the Keppel AmFELS yard at Brownsville, Texas announced an order for a 15,000-cubic-yard hopper dredge, to be delivered in 2023 to Manson Construction. The yard (historically a builder of jack-up rigs) is also constructing two LNG-fueled containerships that will be deployed by Pasha Hawaii in the Jones Act trades from the West Coast.

On the West Coast, General Dynamics' NASSCO, in San Diego (which, like the Philly Shipyard on the East Coast, had earlier successes in delivering multi-vessel series of Jones Act suitable double hulled tankers as the pre-OPA fleet was being phased out), delivered Lurline, the first of two 3,500 TEU container vessels to Matson, which also boast a 500 vehicle garage capacity. A second vessel, Matsonia, is expected to be delivered in late 2020. The vessels, readily upgradable for LNG fueling in the future, will serve in the line's West Coast- Hawaii trades.

With oil price wars and trade wars, economists can ar-

The new maritime academy training ships will be built at Philly Shipyard.

MARAD

gue about whether we are in a "slowdown" or a "recession". However, weak demand on the commercial side (energy and also agricultural) has seen a counterbalance from the government side. The Philly Shipyard has chosen to pivot from commercial to government work- with the contract award emphasizing a need to infuse commercial best-practices. The Philly Shipyard, which had completed a pair of container vessels for Matson, is now set to begin construction, initially, of two training ships destined for maritime academies (with the first going to Fort Schuyler- State University of New York). The newbuilds, with Tote Inc managing the actual contracting and construction process for the U.S. Maritime Administration, will go way beyond

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Matt Tremblay, ABS

"As the [offshore wind] industry and the turbines continue to grow in size and complexity, the vessels needed to install them in U.S. waters will need to be built, and we are seeing increased demand for increasingly specialized vessels."

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their role in training maritime cadets. As National Security Multi-Mission Vessels, their capabilities will enable them to respond to natural disasters, and provide humanitarian aid. The vessels, set to join the National Defense Reserve Fleet, will have ro-ro capabilities (for heavy equipment) and extensive berthing capacity. NASSCO, with no additional deepsea commercial orders announced, is putting its tanker expertise to work, building a series of fleet oilers for the U.S. Navy. Halter Marine is also constructing vessels for the Coast Guard and the Navy, and Eastern is building the Coast Guard's first offshore patrol cutters.

Bollinger's Lockport, La. yard scored a big win in late September with a U.S. Coast Guard awarding a newbuild contract, with four fast response cutters to be delivered during 2022 and 2023. The group also recently received an order for a floating drydock that will service U.S. Navy submarines at General Dynamics Electric Boat yard at Groton, Conn. Austal, another yard with commercial work in its past at its Mobile, Ala. yard (the old Bender facility), has delivered a fast transport ship to the U.S. Navy, with multiple transports also under construction. Like other yards, it has benefited from government work, in this case, with a specialty in troop transports and landing vessels.

The sustainability trend looms large. In the not too distant future, additional U.S. built vessels will be needed to serve offshore wind energy projects. The rumor mill is whirring about numerous discussions said to be underway between project developers and U.S. owners regarding installation vessels. Matt Tremblay, ABS Senior Vice President, Global Offshore, told ***Marine News***, "ABS is involved in a range of projects to support the development of the U.S. offshore wind industry, including providing services to vessels destined to be constructed in U.S. shipyards." He added, "As the industry and the turbines continue to grow in size and complexity, the vessels needed to install them in U.S. waters will need to be built, and we are seeing increased demand for increasingly specialized vessels. ABS is involved in advanced discussions with key players on the development of further Jones Act vessels which will be key to the development of the U.S. industry."

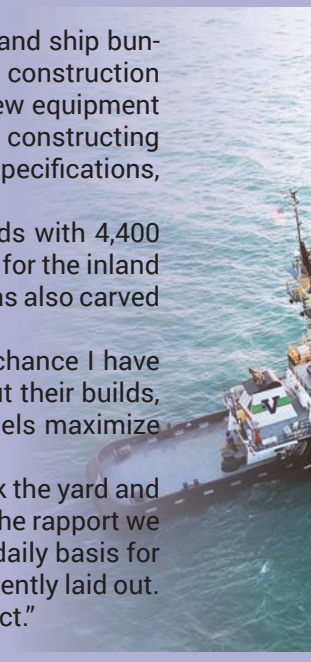
Choosing a Yard: One Customer's Perspective

Vane Brothers, a leading participant in coastal and harbor movements of petroleum products and ship bunkering, has been a major customer of U.S. yards. Capt. Jim Demske, who is in charge of newbuild construction at the Baltimore based vessel owner, explained his criteria for sizing up a potential builder of new equipment for Vane. He explained, "Among many considerations, I want to know the yard's reputation for constructing the type of tug required by Vane Brothers. I need to be certain they can build the design to our specifications, deliver it in a timely manner, and bring it in at our budgeted cost."

Recent Vane newbuilds have included three Assateague class ATBs (built at Conrad Shipyards with 4,400 bhp tugs coupled to 80,000 bbl barges) and two Salisbury class push boats (3,000 bhp), suitable for the inland rivers. Two more of the push boats are under construction, at Chesapeake Shipbuilding (which has also carved out a niche in building small river cruise vessels for American Cruise Lines).

Capt. Demsky continued, "If the yard has been building tugs for many years, there is a good chance I have been aboard some of their tugs or designs. I would already have a good idea of what I like about their builds, their strengths and weaknesses, and what the yard can provide to ensure that new Vane vessels maximize safety, performance and crew comfort."

Vane Brothers takes a hands-on approach, with Capt. Demsky telling ***Marine News***, "I like to walk the yard and talk with management and supervisors to get a feel for the knowledge and expertise they offer. The rapport we are able to build is always important, since I will be interacting with yard personnel on a nearly daily basis for the length of the project. During the walk, I also look to see whether the yard is well kept and efficiently laid out. If the yard is clean and organized, I feel better about entrusting them with a Vane Brothers project."

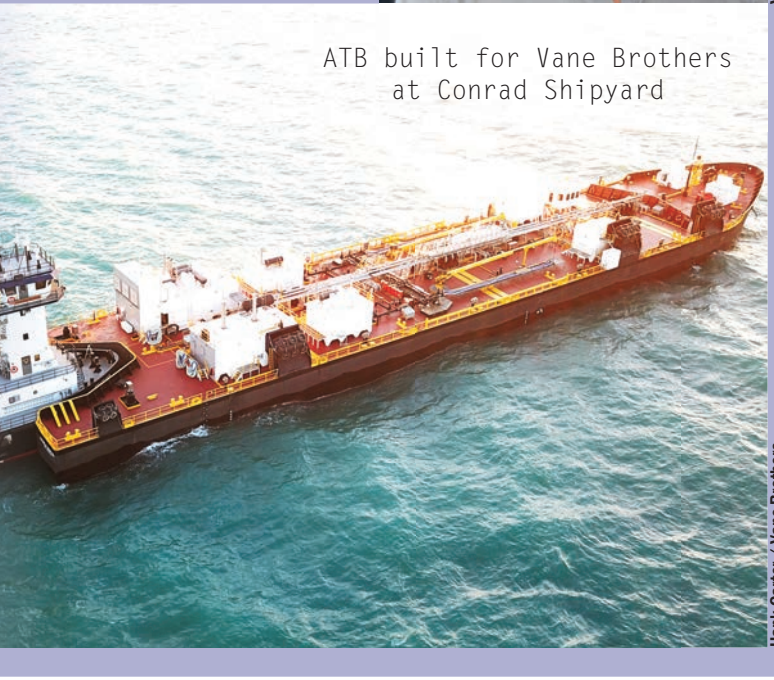


Tremblay explained further, "At the end of 2019 ABS granted VARD the first Approval in Principle (AIP) for a Jones Act service operations vessel (SOV), with primary functions including accommodation, transferring technicians to installations as well as storing spare parts and tools for operations in U.S. offshore wind farms. That milestone has been followed by further AIPs both to VARD for a large SOV and to BAR and Chartwell Marine for an innovative Jones Act crew transfer vessel."

Tremblay pointed to the class society's prominent role in wind energy's buildout, evolving analogously to offshore oil drilling towards floating units. "ABS provides leading classification services for wind support vessels, including self-elevating units, wind turbine installations vessels and offshore support vessels. ABS classed the largest wind farm installation jack-up Seajacks Scylla in 2015 and earlier this year, to the first floating heavy lift installation vessel to be built in Taiwan, Green Jade. ABS is also a world leader in classing floating offshore wind, in process of classing nearly 80 megawatts of floating wind."

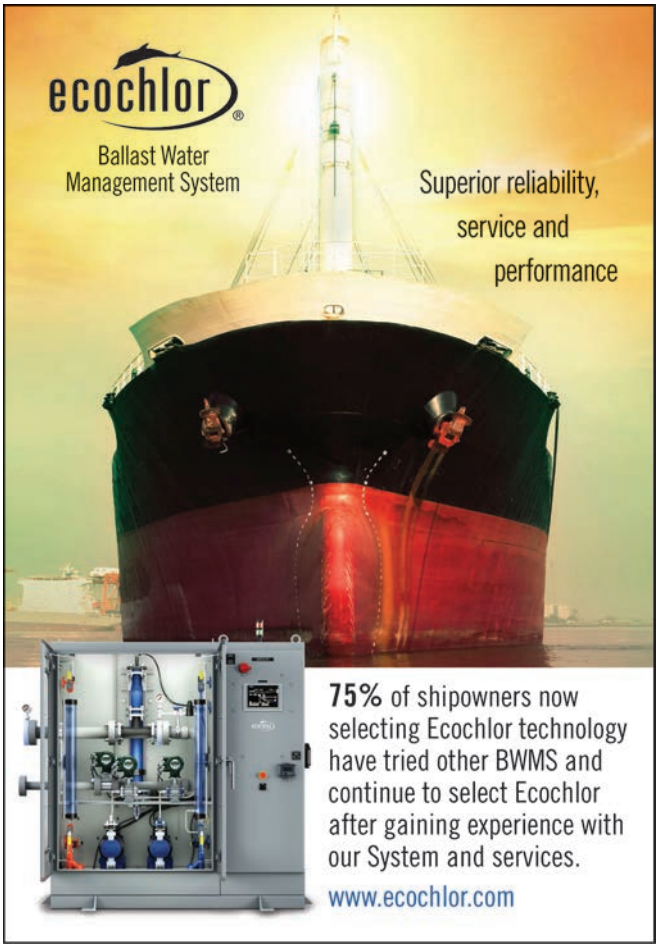
Capt. Jim Demske

Vane Brothers



ATB built for Vane Brothers at Conrad Shipyard

Hank Carter / Vane Brothers



Outfitting the

A. Thomas Higgins

Delivered: June 2020
Builder: Eastern Shipbuilding Group (hull 226)
Owner: Bisso Offshore, a division of E.N. Bisso & Son
Naval Architect: Robert Allan Ltd.
Type: RApport 2400 ship handing tug

Dimensions and Capacities

Length: 80'
Beam: 38'
Draft: 13'-2"
Fuel Oil: 28,000 USG
DEF/Urea: (2) x 850 USG
Potable Water: 8,750 USG

Power and Propulsion

Total horsepower: (2) x 2,550 HP at 1,800 RPM
Bollard pulls: 66.1 tons (stern), 64.2 tons (bow)
Main engines: (2) LA CAT, Caterpillar 3512E Tier 4 EPA/IMO III marine propulsion diesel engines
Main propulsion: (2) Kongsberg/ Rolls Royce US205 P20 Z-Drives
Main generators: (2) Kennedy Engines Co. John Deere 4045AFM85 Tier 3 EPA certified marine auxiliary diesel generator set, each rated at 99kW @ 1,800 RPM

Firefighting

Counterfire ES-125-400, 1,500 gpm at 100 psi, diesel engine driven and 4" Stang remote controlled fire monitor

Modern Tugboat

Deck equipment

Forward hawser winch: Markey Machinery, Inc. Model DEPCF-42 HS, single drum 40HP, Render/recovery, line tension display, electric escort hawser winch
Aft capstan: Markey Machinery, Inc. CEPB-40 5HP tow bitt capstan
Tow hook: Washington Chain & Supply 90-ton SWL tow hook, electric-air remote control, manual or remote release

Regulatory

Emissions compliance: EPA Tier 4
USCG Sub-M, Certificate of Inspection (COI) (Oceans)
Designed and built to ABS class standards (but not classed under ABS rules)
Flag: U.S.

A. Thomas Higgins is the second in a series of two new 5,100-horsepower Z-drive tugs built by Eastern Shipbuilding Group for Bisso Offshore. The new tug and sister ship C.D. White have been customized by the designer Robert Allan Ltd., builder and owner to provide specific operational features including a high bollard pull forward and aft, enhanced maneuverability and escort performance, better fuel economy, crew comfort, safety under the new USCG Sub-M requirements and reduced emissions meeting the new EPA Tier 4 emissions regulations. Eastern has delivered six tugs to Bisso since 2007.

US Shipyards:

Always on the Job Hunt


Gulf Copper

By Eric Haun

American shipyards form an important economic engine, supporting nearly 400,000 jobs, $25.1 billion of labor income and $37.3 billion in gross domestic product (GDP), according to figures from the U.S. Department of Transportation's Maritime Administration (MARAD).

It's a good thing, then, that U.S. shipyards were deemed essential businesses amid COVID-19 and have remained up and running throughout the pandemic. And it's even better that most yards have been able to keep their workers employed despite less than stable market conditions, and that many are actively hiring to grow their staff counts.

"Great Lakes is always seeking skilled and talented personnel looking for a long-term career opportunity. We're looking for electricians, welders, fitters, mechanics, quality technicians, project engineers and managers, and a controller," said Joe Starck, president of the Great Lakes Towing Company and Great lakes Shipyard.

While the pandemic's business effects have made commercial repair jobs hard to come by for the company's Cleveland shipyard, Starck said the stream of government repair work has been steady and is expected to remain solid through the winter. The yard is also busy building the sixth vessel in a series of Damen 1907 tugs for the towing division, and it has its eyes on several potential projects in the pipeline, both for new construction and repair.

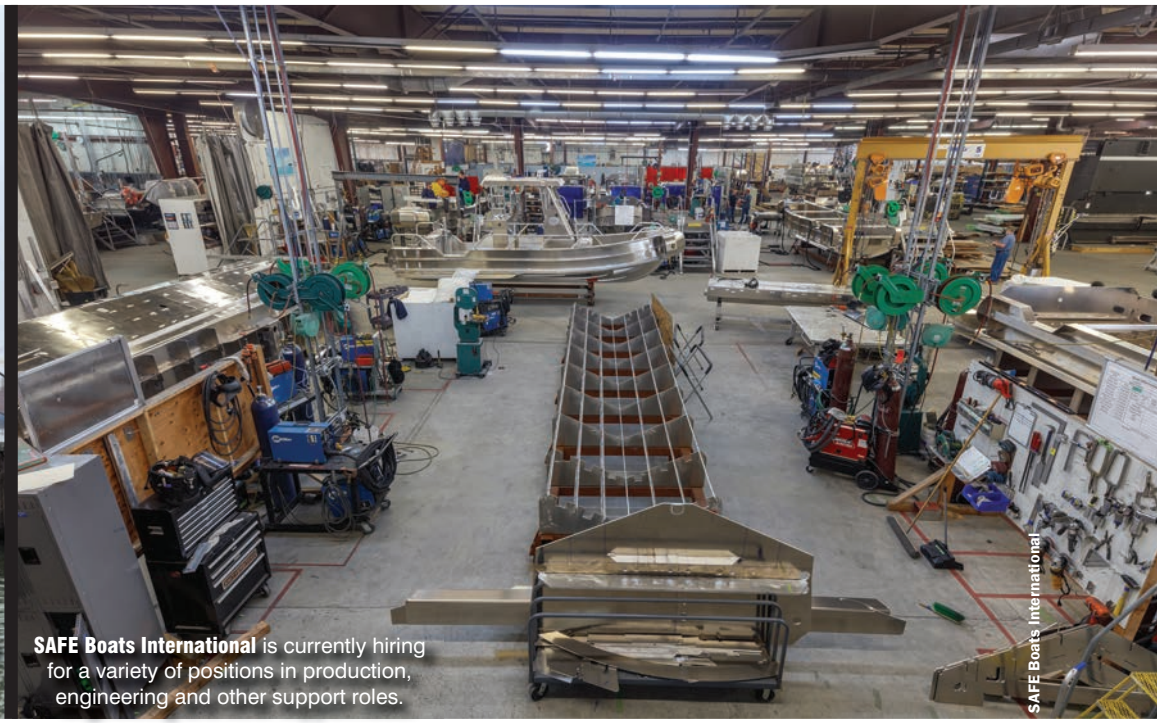
Fincantieri Marine Group president and CEO, Dario Deste, said the group's Wisconsin shipyards will hire nearly 1,000 additional people over the next few years. "With our main naval shipyard, Fincantieri Marinette Marine, receiving the contract to design and build the U.S. Navy's FFG(X), as well as our other design and build work in our system-of-yards, we believe we will have steady work for years to come," he said.

"We are always looking for great teammates and hiring in nearly every skilled trade, as well as management, and in our engineering department," Deste continued. "With the detailed design work underway for the Navy's FFG(X), the priority is bringing on additional engineers right now. As frigate production starts in 2021, we will ramp up hiring each year. It is an exciting time to be part of our team, to be honest. Whether it's design, construction or maintenance and sustainment, we are solidifying our place as a tier one American shipbuilder," Deste said.

On the West Coast, the pandemic has not diminished the strong sales and backlog of aluminum boatbuilder SAFE Boats International, who is currently hiring for various positions in production, engineering and other support roles at its Bremerton, Wash. shipyard.

"The pandemic has had no impact on our staffing needs," said SAFE Boats' human resources director, Cindy McFarland. "We have not seen any attrition related to COVID-19, staffing has remained consistent and we are hiring based on our plan for 2020."

Gulf Copper & Manufacturing Corp is constantly on the lookout for quality tradesmen.



SAFE Boats International is currently hiring for a variety of positions in production, engineering and other support roles.

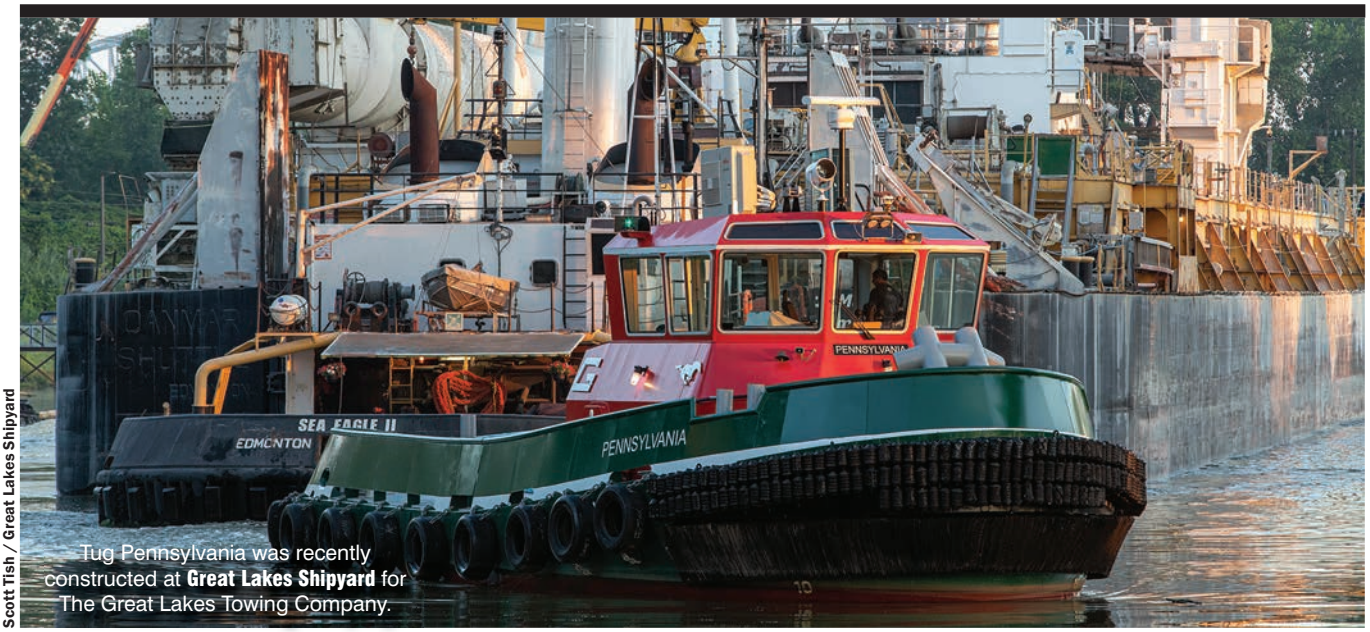
SAFE Boats International

With three busy yards along the U.S. Gulf Coast and a healthily backlog of government and private vessel work, Gulf Copper & Manufacturing Corp is constantly on the lookout for quality tradesmen, according to Mark Ashwell, Managing Director of Business Development. "With several large projects secured, Gulf Copper will look for 20-30 more staff for project support per facility," he said.

Many other shipyards along the Gulf Coast say they are hiring too. Edison Chouest Offshore, which very recently announced it will build and operate the first-ever U.S.-flagged Jones Act compliant service operations vessel (SOV), used for offshore wind farm operation and maintenance works, will spread the build across its shipyards in Florida, Mississippi and Louisiana, creating more than 300 new jobs in the process. In addition, one of Chouest's shipbuilding facilities, Gulf Ship in Gulfport, Miss., is expanding and making facilities improvements to fulfill a new tugboats contract. This project will create more than 200 new jobs.

Some 30 miles east, repair yard ST Engineering Halter Marine and Offshore is expanding in Pascagoula, Miss. through a $10 million corporate investment project that will create 100 jobs and add equipment, dock space, water depth and other upgrades to prepare the shipyard to handle larger ships and oil platforms.

Eastern Shipbuilding Group says on its website that it regularly hires workers in a wide range of hands-on shipbuilding roles. As of September 30, group also had no less



Scott Tish / Great Lakes Shipyard

Tug Pennsylvania was recently constructed at **Great Lakes Shipyard** for The Great Lakes Towing Company.

than 30 immediate corporate job openings listed online as the Panama City, Fla. shipbuilder looks to fill roles ranging from administrative assistant to analysts, designers and drafters, superintendent and project managers.

On the other side of Florida, St. Johns Ship Building in Palatka has been staying busy with new construction and repair work for a wide range of vessels. The company says on its site that it is looking for experienced personnel in a number of trades positions.

Bollinger Shipyards in Louisiana has both professional/staff administration and production trades/crafts openings listed online. Metal Shark, which on its site currently shows job availabilities at its Jaeanerette and Franklin, La. facilities, recently took to LinkedIn to announce the open positions. Colonna's Shipyard in Norfolk, Va. has 87 job openings on LinkedIn, and Portland, Ore.-based Vigor has 126.

Attracting and retaining talent

While U.S. shipyards' need for talent has been steady, one problem has been that the stream of qualified candidates available to fill open positions is often anything but. For a lot of shipyards, finding and retaining skilled workers is a perennial challenge.

"Finding good qualified full-time shipyard employees has always been a challenge," said Great Lakes' Starck. "We have supplemented with labor supply contractors for the past several years, and many of those workers have been here a long time. In the meantime, we are always trying to 'grow our own' and when we find talented candidates who have the right experience, we generally find a place for them."

McFarland said SAFE Boats' relatively remote location and smaller talent pool to draw from compared to major cities like Seattle can create hiring challenges. "Skilled trades people with specific experience we need such as aluminum welding can be difficult to find," she said.

"SAFE Boats relies on traditional recruiting tools and methods such as posting on Indeed and other job sites," McFarland said, adding, "SAFE Boats has invested in great relationships with area trade schools and educators who refer their students and alumni, as well as word-of-mouth and referrals from existing employees."

"We are very fortunate in that our company culture is very focused on our team members, and therefore our retention is high as compared to the rest of the industry," McFarland said. "We benefit from our reputation of being a great company to work for that takes care of its team."

"There is little doubt about it, finding and retaining the best people is always a challenge," said Deste, who adds that the pandemic has piled on another obstacle to overcome when recruiting and hiring employees. "We, like other major shipbuilders, have to recruit locally, regionally and nationally given the competitive landscape. That hasn't changed during COVID, but not being able to physically attend as many hiring fairs and have conversations with prospective employees is a new challenge," he said.

"Even during COVID-19 though, we have continued to bring on new employees. We have reduced the size of our on-boarding classes in the shipyard and we have done more interviews virtually than ever before; but we continue to seek out and find the highest quality teammates," Deste said.

Ashwell said employee-owned Gulf Copper is combatting hiring challenges with competitive salaries and great benefits and insurance coverage. He added that the company's employee stock ownership plan (ESOP), which al-

A littoral combat ship is moved from an indoor production facility at Marinette Marine in preparation for launch.

U.S. Navy photo courtesy of Marinette Marine by Val Ihde

lows all employees to be invested in the company as shareholders, plays a positive role in attracting talent. Having 75 years of shipyard experience and history with a great HR team and vast employee database helps too, he said.

Colonna's and other yards such as Detyens Shipyards in Charleston, S.C. and Austal USA in Mobile, Ala. have found success with apprenticeship programs that provide a mix of academic instruction and on-the-job training. Taking this to the next level, The Apprentice School at Huntington Ingalls Industries' Newport News Shipbuilding division in Newport News, Va. is approved by the state of Virginia to operate as a postsecondary institution.

Bob Merchent, CEO of Halter Marine in Pascagoula, Miss., said the need to strengthen and grow a skilled labor force for its U.S. Coast Guard Polar Security build program is "both a blessing and a challenge". So, the shipyard created an apprenticeship program with the Mississippi Gulf Coast Community College that provides on-the-job training, classroom training and a progressive wage increase as participants reach milestones. "We are off to a very good start," Merchent said, noting 10 students are enrolled in each of the five craft labor disciplines (welding, ship fitting, pipe fitting, pipe welding and electrical) for a total of 50 apprentices.

"I'm very excited to see this first class of apprentices," Merchent said. "Future shipyard leaders often begin their careers through apprentice programs, so we likely now have a future vice president or even a CEO in this class."

New LNG ATB Bunker Vessel is a US First

By Alan Haig-Brown

Bunkering ports around the world have long used a variety of small tankers or tug and barge combinations to deliver fuel to visiting ships. Mostly this was heavy oil, but recently a new breed of bunkering vessels is emerging to deliver clean burning liquefied natural gas (LNG) to modern ships with dual-fuel capabilities.

The fall of 2020 will see a new addition to this fleet servicing ships in Florida and the Caribbean. As an articulated tug barge (ATB) combination, the vessel will have a cargo capacity of 4,000 cubic meters of LNG. The tug, designed by Jensen Maritime and to be named Q-Ocean Services, is 128 by 42 feet with a molded depth of 21 feet. It will operate while fitted in the stern

Both images: Q-LNG

notch of the 324- by 64-foot barge designed by Waller Marine. The barge has a molded depth of 32.5 feet. Both vessels' detail design was done by Halter Marine under mutual agreements.

Propulsion power on the tug will be a pair of 1,900-kilowatt (2,548 horsepower), Wabtec 6L250 MDC EPA Tier 4 and IMO III main engines, with Wärtsilä Z-drives. This will give the ATB a 10-knot design speed with an estimated 65-ton bollard pull. The tug will have tankage for 105,686 gallons of diesel fuel, while the barge will have tanks for 13,890 gallons of diesel. The ATB will be ABS-classed, capable of dynamic positioning DPS 1+. The tug will have accommodation for up to 12 crew including tanker-men. The tug will also be equipped with two reverse osmosis water makers capable of producing 2,000 gallons of fresh water per day.

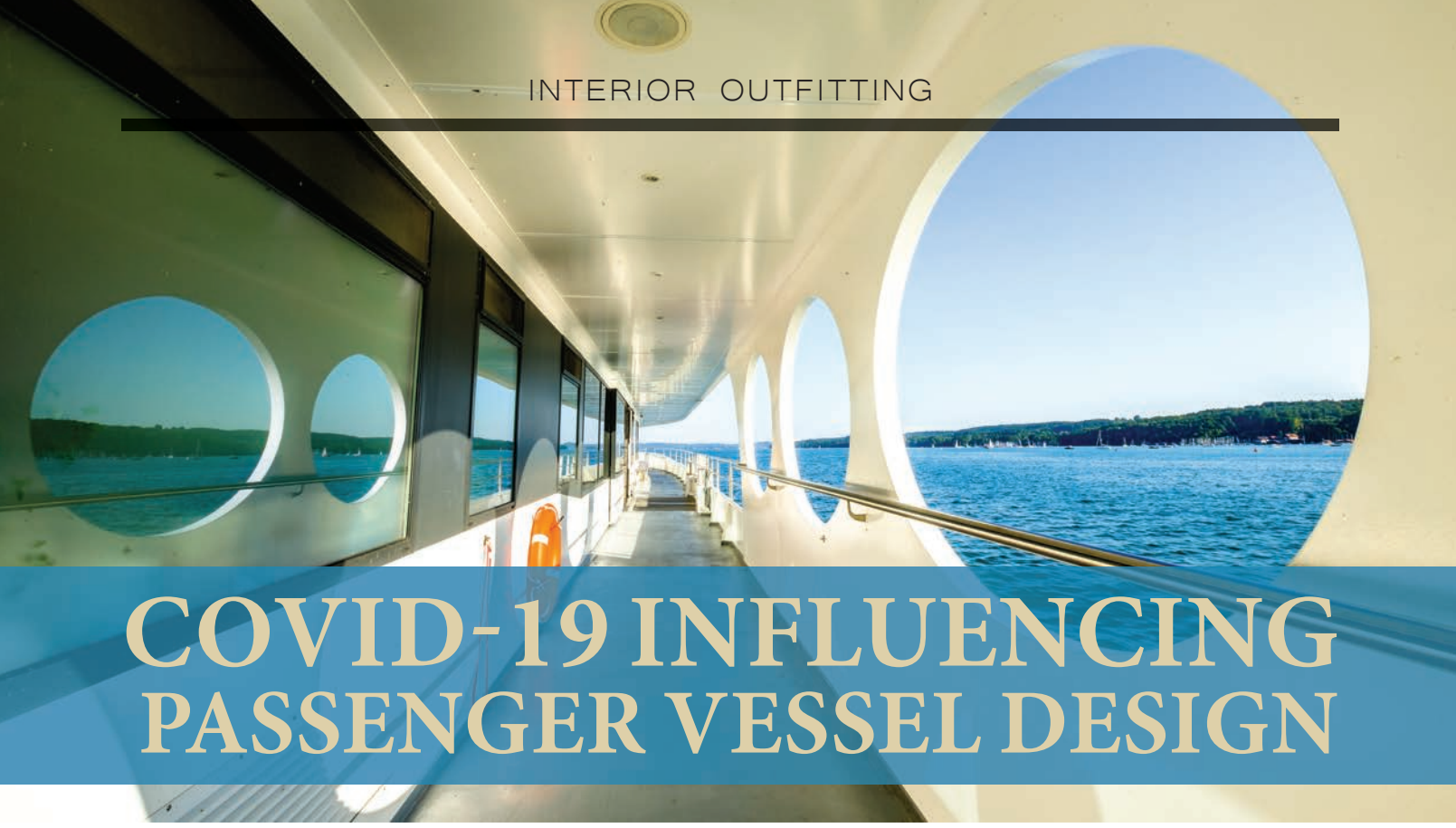
Auxiliary power, servicing a wide range of functions on both the tug and the barge, will be provided by a total of nine Cummins marine engines. The tug has two QSM11-DM powered 150-kilowatt SSDGs. These engines are fitted with through shafts that can also run fire pumps, including those supplying two off-ship monitors. The tug will additionally have a single Cummins QSB7-DM-powered, 99-kilowatt harbor generator, and a QSB7-DM-powered, 79-kilowatt emergency generator.

The barge, with large power demands, has five, QSK19-DM-powered, 450-kilowatt generators. These will power a range of functions on the barge including four mooring winches and two hose handling cranes. The tug will also have two stores cranes, one forward and one aft. The barge is fitted with a ballast water treatment plant provided by Wärtsilä as well.

Initial clients for the new vessel will be Carnival Cruise Line's two new dual-fuel ships and two dual-fuel Siem Car Carrier ships under charter to the Volkswagen Group to transport vehicles from Europe to North America. The ATB is being constructed to meet U.S. flag requirements, as well as ABS Class and the requirements of the IMO International Gas Carrier Code.

The first LNG ATB bunker vessel built in the U.S., Q-LNG 4000 is currently on sea trials from Halter Marine in Pascagoula, Miss. and will soon be delivered to Quality Liquefied Natural Gas Transport, which is owned by Harvey Gulf International Marine's CEO Shane Guidry. Shell has signed a long-term charter for Q-LNG 4000, which will operate out of Port Canaveral, Fla.

Q-LNG, with Chad Verret as President, has also signed a letter of intent for an 8,000-cubic-meter LNG ATB unit with Halter Marine, but that has not as yet been firmed up as an order.



COVID-19 INFLUENCING PASSENGER VESSEL DESIGN

By Eric Haun

Not long ago, at the start of 2020, the market for passenger vessel construction was booming, with record orders rolling in across the size spectrum, from small passenger vessels all the way up to the world's largest mega cruise liners.

But then passenger vessels of all types and sizes began to empty out as COVID-19 spread. A large number of ferries were taken out of service or left operating with drastically reduced ridership (or in some cases, none at all) while the cruise industry—a related but separate species—was brought to a virtual standstill. The new construction business that was so strong quickly dried up. Many existing vessel orders were shelved or scrapped altogether, and the once steady stream of new orders was reduced to something less than a trickle.

Now, as travel and transit restrictions begin to ease in some locations, the passenger vessel industry is plotting for its eventual return to full service, complete with health and safety adjustments suited to the new coronavirus world. While the timing of any significant restart remains uncertain, the fact that safe operations will require a host of procedure and protocol changes is a given. Even design changes, especially to vessel interiors and onboard public spaces, are expected to come about.

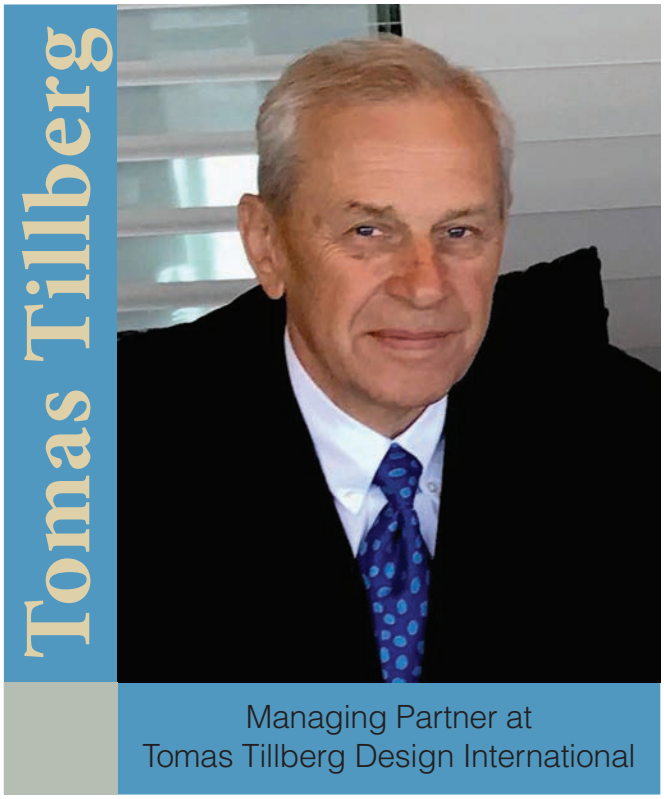
Tomas Tillberg, a managing partner at Tomas Tillberg Design International, noted that even in the past, before COVID-19, there were high-profile cases of illnesses on passenger ships that led to an increased focus on sanitation measures on board as well as new rules and regulations for things such as hand washing and dining arrangements.

Of course, a strong focus on health and safety is nothing new for the passenger vessel industry. The current pandemic has simply amplified it as operators and designers hash out new solutions to the current situation.

"Now what we see occurring is companies will come up with new ideas and new materials and new design solutions that will be more cutting-edge in this aspect. And the companies that are on the forefront of that have a lot to gain," Tillberg said.

Tillberg's Florida-based company specializes in the design of passenger vessels. Carlos Reyes, the firm's other managing partner, said the company is hard at work developing a number of solutions that will, first and foremost, keep passengers safe, but also help them to feel safe and comfortable on board.

"The selection of a given cruise line by the customer is not going to be driven only by the itinerary or the food, entertainment or the price; it's going to be heavily driven by at what point you feel safe bringing your family on board," Reyes said.



"From a design perspective, we are very conscious of the density of people in a given space," Reyes said. "We are working on solutions that take advantage of the space the best we can and give the passenger the feeling that they are safe on board the ship."

"One of the main elements that we believe will change will be the space per passenger ratio in public areas. People need to feel less crowded, which gives a sense of safety," Reyes said. "For sure, the outside decks and open areas will be utilized more than before."

Tillberg said the company is also examining the ways passengers move around aboard ships and how to create more open spaces and areas outside.

For the most part, reutilizing certain onboard spaces (such as open areas, for example) is fairly straightforward, Reyes noted, but he said this becomes much more challenging in other parts of the ship such as in high-traffic and heavily utilized passenger corridors.

"It's a whole new family of ideas and designs you have to grapple with," Tillberg added. "It's a nice challenge actually, and I think sometimes these challenges bring forth better designs in general. We sort of get off the beaten track. We have to rethink things, which is very good from a design viewpoint."

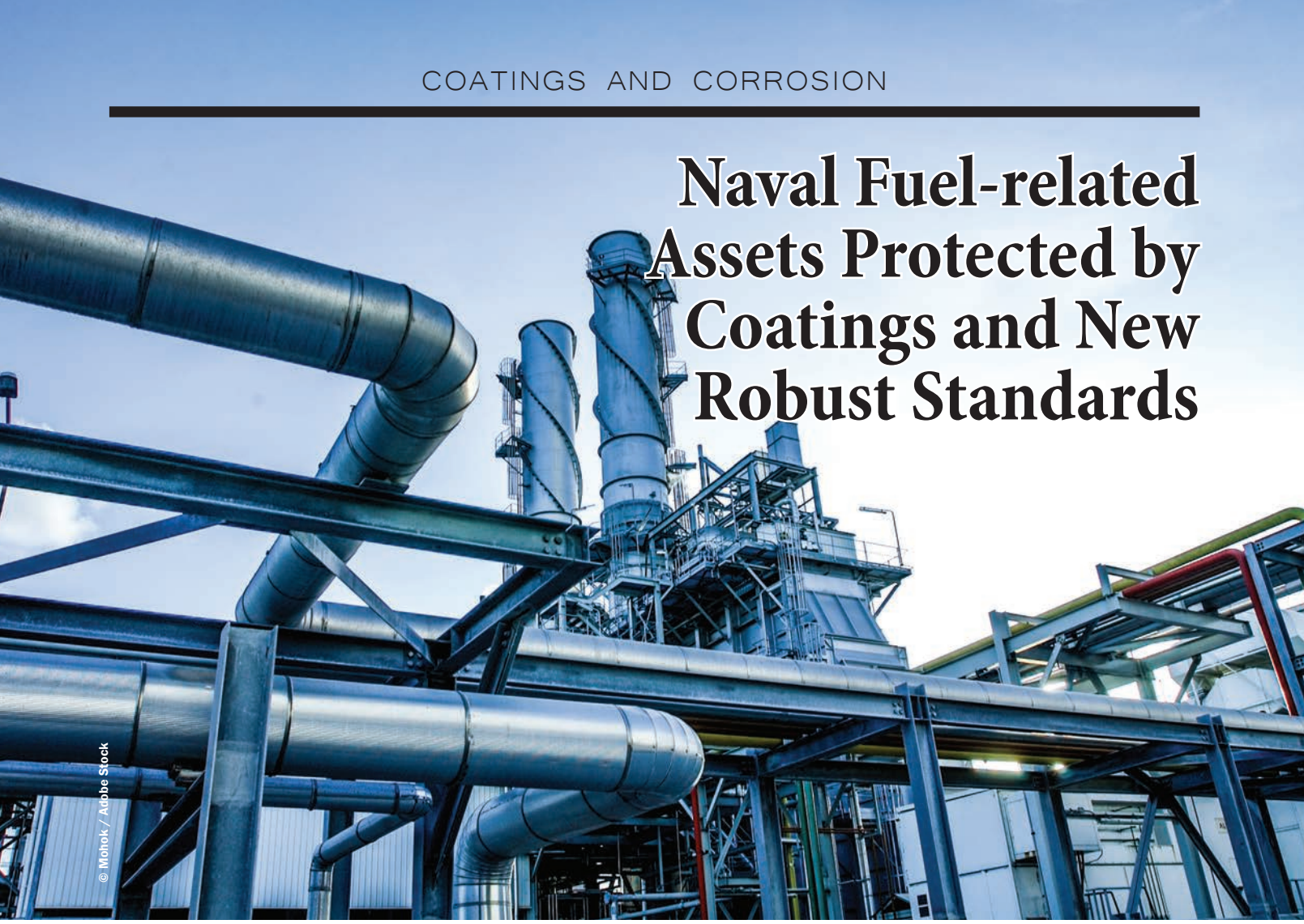
One aspect of passenger vessels that will be very important to consider along the uncharted course ahead is the types and properties of materials that are used in passenger spaces, and how they could potentially contribute to greater onboard health and safety. The development and choice of paints, flooring, fabrics, furniture, etc. are receiving more attention than ever before.

"We are looking at materials all the time. New materials are very important for us," Tillberg said. "Now there is a lot of focus on what materials will help in preventing the spread of COVID. There are already suppliers who provide surfaces that are COVID-resistant and also that are very easy to clean. Even fabrics. This is something we're looking at all the time. We rely on the manufacturers and the scientists they work with to develop these materials and we're very alert to what comes out."

While the newbuild market is unlikely to see any sweeping rebound anytime soon, that's not to say there won't be other opportunities for designers, yards and suppliers.

Reyes believes the reactivation and modification of the many passenger vessels that have been idled for months throughout the pandemic will provide significant market opportunities going forward. Health and safety will surely be at the forefront. "There will be a lot of opportunities, without a doubt, to work together with the cruise lines to come up with very innovative solutions," he said.

Naval Fuel-related Assets Protected by Coatings and New Robust Standards



By Terrance Mayes

The U.S. Navy has many assets other than its seaborn vessels to care for, and recently it adopted new standards to protect those that are fuel-related. Naval Facilities Engineering Command (NAVFAC) contracted with Master Painter Institute (MPI) services to establish product standards for interior carbon-steel fuel pipes, interior welded fuel tanks, exterior steel systems and waterfront steel structures. These new standards, known as the MPI 500 Series Standards, are for use in numerous aspects of work involving specialized Department of Defense (DoD) petroleum, oils and lubricants (POL) facilities as well as shoreline structures and construction.

NAVAL COATING ORIGINS

The Navy's love affair with paint has a long history, and in its heyday involved a robust program for paint chemists and labs to develop and manage their paint standards. These Navy and U.S. federal paint standards were based on the chemical composition of paint and bore names like TT-E-489 Enamel, Alkyd, Gloss, Low VOC Content; TT-P-29 Paint, Latex; and A-A-2962 Enamel, Alkyd.

In the 1990s, the U.S. government determined it was cost-prohibitive to run their own paint lab and test regimen, so a presidential order directed the Navy to seek out and adopt the best available alternative system of paint standards.

MPI offered two critical advantages over the current Navy/federal program:

1. Performance-based standards

Traditional paint standards were composition-based and essentially prescribed a recipe for a particular kind of paint and most were for product types with well-established performances and service lives. This approach worked well enough with the industry producing the same technologies for decades, but proved to be a liability when the leap was

made to develop new chemistries for lower volatile organic compound (VOC) products that had no track record of field performance.

By contrast, MPI standards defined what good looks like, by defining the level of performance the product should provide based on a regimen of tests tailored to each type of coating. MPI standards are classified around basic paint types such as alkyd versus latex, and clear versus pigmented, with the requirements to pass these standards being virtually agnostic to the composition. This protocol of approving products based on performance gave specifiers an invaluable compass with which to navigate the sea of new low-VOC and water-based products.

2. A strong lab testing/approval program

Products approved by MPI were proprietary paints supplied by a wide range of industry suppliers with distribution capabilities across the U.S. and Canada. This list of approved products offered the Navy ready access to source the products they needed.

Over the course of three days, Naval paint experts reviewed MPI standards and, ultimately, the decision was made for the Navy to adopt MPI standards and Approved Products Lists.

APPLICATION OF THE MPI 500 SERIES

With more than 70 bases worldwide that can span areas up to 149,000 acres in size, the Navy owns a vast inventory of POL systems. These are considered among the most critical of land-based Navy assets in terms of a combination of risk from corrosion; the need for continuous direct support of base operations; and the life cycle cost effectiveness of utilizing appropriate corrosion control systems.

Exterior corrosion such as pitting and surface erosion on above-ground POL facilities can occur due to the following atmospheric effects: temperature, humidity/atmospheric moisture, precipitation, salinity, topography, ultraviolet (UV) light, winds, chloride deposition, sulfur dioxide deposition and other pollutants.

OTHER COATING REQUIREMENTS

In addition to rigorous performance testing, the 500 Series includes material-based requirements that impact personal and environmental safety as well. Products submitted must be free of lead and chromate, benzene, chlorinated compounds, or ethylene-based glycol ether and their acetates; have a maximum VOC of 340 g/l (2.8 pounds/gallon); and have a flash point (the temperature at which a particular organic compound gives off sufficient vapor to ignite in air) below 95*F.

There are also requirements around ease of application, including viscosity, pot life, dry time, condition in can, storage stability and fineness of grind.

TESTING AND PERFORMANCE PARAMETERS

Performance tests in the series include:

Knife test: Adhesion is verified by measuring the coating system's resistance to a cutting force.

Reverse impact test: The lining's ability to maintain integrity and adhesion is measured if the exterior of the tank gets dented. The uncoated side of the test panel gets hammered, and the coated side checked for cracking or any other loss of adhesion greater than 15 mm in diameter.

Fuel and water resistance: Test panels are immersed for 21 days in glass jars containing a mix of JP-8 fuel and distilled water. The surface is then checked for blisters, darkening, or any indication of loss of adhesion (like softening).

Color: The difference in color between the primer and the topcoat helps the inspector verify the coating's coverage, which is far more crucial with linings for immersion service than paints for atmospheric service.

Immersion testing: Coated panels are submerged in various fuel/water mixtures at an elevated temperature for 180 days to simulate extreme usage condition

Freeze-thaw stability: Coated panels are exposed to a 30-day cycle of freeze/thaw that includes 16 hours at -30°C followed by 4 hours at 50°C.

Accelerated weathering: Coated panels are tested for 50,00 hours according to ASTM D5894, varying between a UV/condensation chamber and a salt fog/dry chamber. Panels are evaluated for rusting and blistering every 1,000 hours during the process.

CONCLUSIONS

With the adoption of new robust standards, the Navy has positioned itself to protect its fuel-related assets including transportation and storage of fuels, fuel tank interior structures, steel sheet piling, and other steel waterfront structures for many years to come. Consideration was given to both performance in the field and the safety of those applying the coatings. These standards are such that adoption by other organizations would be simple and save the associated organization the time and effort spent specifying, testing, and evaluating coatings for their use.

New Towboat Gets a Complete Thordon Propulsion Package

A 1,600-horsepower towboat delivered to Harvey, La.-based operator L&L Marine Transportation in June is now operational with a full range of Thordon oil-free and grease-free bearings.

Designed by Entech, the 65-foot twin-screw towboat Amelia Ray is purpose-built by Rodriquez Shipbuilding in Coden, Ala. for the transportation of petrochemicals along all inland and coastal waters in the southern states of the U.S.

In addition to newest towboat addition, L&L Marine operates the 2,000-horsepower Melissa Lee and three 1,200-horsepower vessels Angela Rae, Myrna Ann and Madeleine Michelle. Besides working the Harvey Canal, the company offers towing services anywhere below Baton Rouge, La. and from Houston to Mobile, Ala.

While all five of L&L Marine's vessels are equipped with Thordon bearings, Amelia Ray is the first newbuild in the fleet to be specified with a Thordon propulsion package at the vessel design stage.

According to L&L Marine owner Lee LeBoeuf, the "significant operational savings" experienced with previous successful retrofit installations led to the selection of Thordon's RiverTough tailshaft bearings, shaft liners, TG100 seals, ThorPlas-Blue rudder bearings, ThorPlas-Blue Self Aligning Bearings (SAB) and SXL thrust washers for the Amelia Ray.

"We initially replaced all our rubber tailshaft bearings with Thordon's RiverTough bearings and shaft liners and found we were able to extend drydocking intervals from three to eight years," LeBoeuf says. "We then started retrofitting ThorPlas-Blue bearings in the rudder stocks and installing TG100 seals, which reduced operational costs even further as there is less vessel down time and maintenance. This means we are more attractive to our customers, more dependable and more reliable. We can better plan drydock schedules in line with the operational needs of our customers."

Thordon Bearings designs and manufactures a complete range of journal bearing and seal systems for marine, clean power generation, pump and other industrial markets. The manufacturer says its products are built using proprietary non-metallic polymer materials that are lubricated with water eliminating oil or grease usage, meaning zero risk of oil pollution to rivers, lakes and oceans.

Thordon sales manager Jim Bright says, "L&L Marine, a longtime customer for Thordon Bearings, has a small fleet of workboats which means that the financial risks are higher if a vessel has to come out of service for repair work. Lee tells me that the switch to Thordon bearings and seals has not only mitigated these risks but helped facilitate improvements to the bottom line."

Bright notes the performance of the Self Aligning Bearings, in particular. "The tiller arms of the steering system on this new vessel were also fitted with Thordon's Self Aligning Bearings on both the live end of the steering cylinder and the jockey bar. The SAB, made from ThorPlas-Blue polymer material, is not only self-aligning, but it also provides grease-free operation. This allows the tillers to operate with independent suspension. As the rudder works there is no binding of the jockey bar which would typically result in increased stress and wear on the bushings, resulting in reduced maintenance and associated costs."

While capital expenditure is more than a conventional tailshaft/propulsion bearing system, LeBoeuf expects the Thordon application aboard Amelia Ray to generate annual operational savings of $15,000. "Compared to conventional propulsion and tailshaft bearings, which require regular maintenance, replacement and frequent drydocking, the Thordon system results in threefold reduction in operational costs," LeBoeuf explained.

Amelia Ray is powered by a pair of Mitsubishi S6R2 diesel engines from Laborde Products. The engines, which deliver 1,600 total horsepower at 1,400 revolutions per minute, drive Kahlenberg screws through Twin Disc MGX5321

L&L Marine Transportation's newest towboat Amelia Ray has built by Rodrigues Shipbuilding in Alabama.

Thordon Bearings

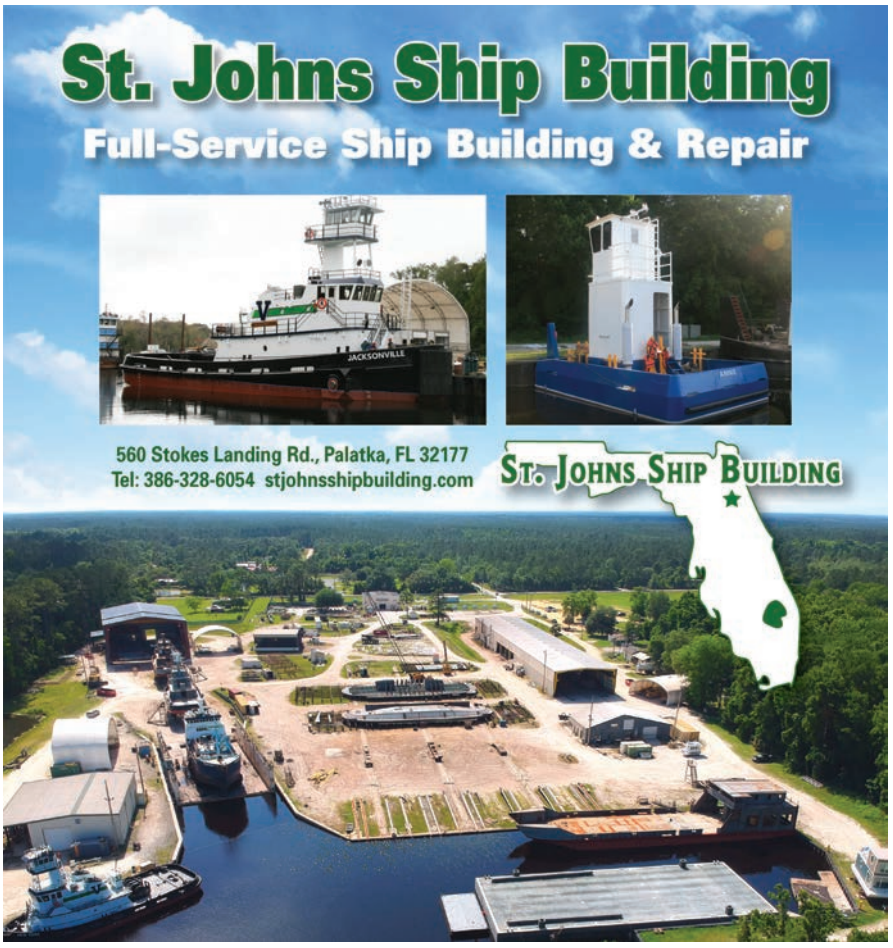
reduction gears. Two 60kW Cummins generators provide power to, among other consumers, a Hydra Force electric-over-hydraulic steering system.

With tank capacity to transport 15,000 gallons of petrochemicals, 4,100 gallons of potable water, 500 gallons of lube oil and 400 gallons of dirty oil, L&L Marine's new vessel is Subchapter M compliant and able move barges carrying oil or hazardous materials in no discharge areas from St. Marks, Fla. to Rio Grande, Texas on the Intracoastal Waterway and rivers not more than three miles from shore.

L&L Marine Transportation was founded by LeBoeuf's father, Carl, in 1978, and has served the industry along the Harvey Canal for 42 years.

The company's newest vessel Amelia Ray, named after the current owner's four-year-old granddaughter, was set to work without a full-fledged christening due to the coronavirus pandemic and is currently transporting petrochemical products along the Mississippi between Houston, Texas and Baton Rouge, La.

L&L Marine has an option for an additional vessel from Rodriquez Shipbuilding, but LeBoeuf is waiting for some of the market uncertainty surrounding the coronavirus to clear before choosing whether or not to go through with the order. "We will wait to see how COVID-19 plays out before making the decision," he said.



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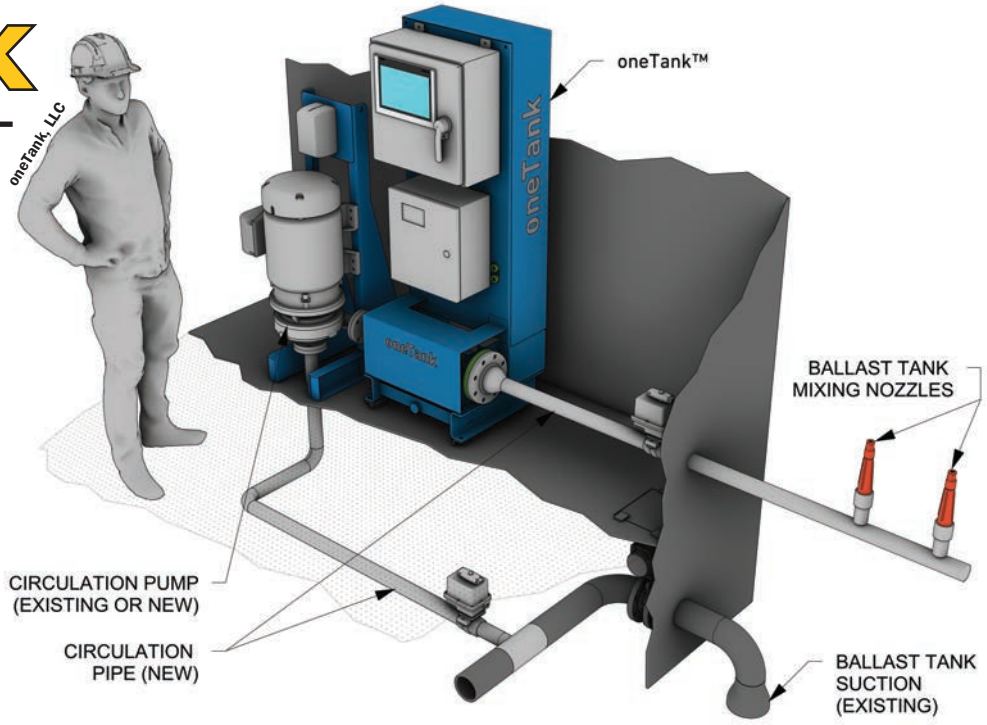

In mid-September, the U.S. Coast Guard Marine Safety Center issued the 35th USCG Ballast Water Management System Type Approval Certificate after a detailed review of Seattle-based manufacturer oneTank, LLC's type approval application determined its system met the requirements of 46 CFR 162.060.

The recent U.S. Coast Guard Certificate of Approval, which follows the DNV GL Certificate of Approval awarded on behalf of the Norwegian Maritime Authority in compliance with the International Maritime Organization BWMS Code in July 2020, completes the suite of international approvals required for the oneTank ballast water treatment system.

"We are pleased to receive these approvals, applicable for all ballast water salinities and temperatures. Superintendents and operators have been looking for a product like oneTank, keeping it simple when you only need to treat one or a few ballast water tanks," said Kevin Reynolds, managing director of oneTank, LLC, a Glosten spinoff company.

With oneTank now type approved by the U.S. Coast Guard and Norway, regulatory compliance is ensured worldwide, including the United States where the system was conceived by Glosten engineers who have worked on ballast water treatment problems since 1999. The system's developers recognized that many operators have needs that are not being met by existing product offerings. Where existing systems have mostly been developed with larger ships in mind, oneTank focuses on the tankship aftpeak tank, which results in a light, simple and compact system that requires only 15 amps of electrical power. oneTank's reduced footprint of just two square-feet also meets demand from small vessels such as yachts and workboats that are balancing power and space restrictions with meeting requirements.

Engineered as a low-cost ($65,000 per system) treatment option intended for vessels that do not need a complex solution, oneTank is a derivative of the inTank dispersal system brought to market by parent company Glosten, Envirocleanse, and Scienco/FAST and patent protected by U.S. Geological Survey. The inTank system treats ballast water within the vessel's ballast tank and has no filters, no ultra-violet bulbs and no electrolytic generators. Similarly, oneTank is an in-tank, bulk chemical treatment process for ballast tanks up to 4,000 cubic meters, with in-tank neutralization prior to discharge.

Sean Ritchie, oneTank's chief engineer, said, "This is a third-generation technology. What differentiates oneTank from other treatment systems is its simplicity, which makes it easy to install, operate and service."

No compressed air, fresh water, or other auxiliary supports are needed. And with no filters to clog or clean, treatment is achieved by applying and mixing bulk chemical in-tank. This process means users can treat on their own schedules, avoiding busy in-port times, the manufacturer said, adding that the system's operation is fully automatic, supporting local or remote operation. oneTank can treat 4,000 cubic meters of ballast water in under 30 hours.

The system uses 8.25% sodium hypochlorite (bleach) solution and 30% sodium thiosulfate solution – chemicals that can be purchased from chemical suppliers worldwide.

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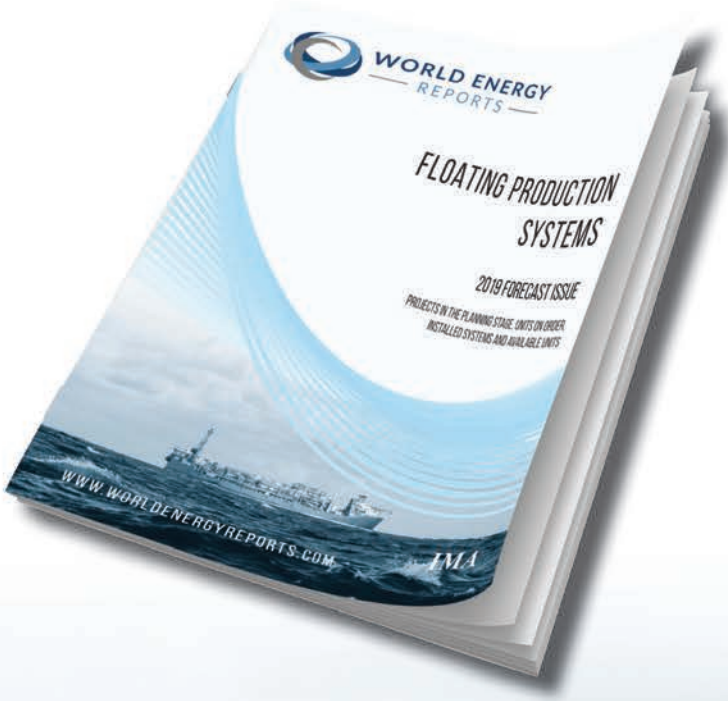

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BioBarrier MarineMBR

The BioBarrier MarineMBR series of Type II sewage treatment plant (STP) from marine sewage and water treatment specialist Scienco/FAST is engineered to help meet the increasingly stringent needs of U.S. Coast Guard (USCG) and International Maritime Organization (IMO) water quality standards and is ideal for water reuse applications, its manufacturer says.

With its decades-long history providing adaptable and proven marine sewage devices, environmentally-friendly cleaners and other industrial water management technologies, Scienco/FAST, a BioMicrobics subsidiary, offers membrane technology treatment options that remove 99.9% of pollutants and contaminants found in vessels' sewage sources, including domestic and high strength wastewater flows.

The BioBarrier MarineMBR uses an advanced process that acts as an impenetrable physical barrier for nearly every common pollutant found in wastewater. Certified by the USCG to 33 CFR Part 159 standards and to IMO resolution MEPC.227(64), the system is capable of treating with freshwater or saltwater (input <6.5% salinity) flushing or combination of the two.

"The Marine BioBarrier MBR cleans the black and grey water and galley waste water to the highest stands removing virus for water reuse opportunities such as toilet flushing or washing machinery. Essentially the water is cleaner than waste water," says BioMicrobics' president, Bob Rebori, who explained that the system was designed to be a simpler version of other more complicated options on the market. "Everything we do with our marine sanitation devices (MSD) is to make them very simple to install, operate and maintain over the life of the vessel or platform. Every system has a wet functionality test prior to shipping to minimize installation time."

The company's systems are also known for their durability and reliability, and Rebori says about half of Scienco/FAST installs are retrofit projects, often replacing other manufacturers' systems that have failed.

Part of the MarineFAST product line, the BioBarrier MarineMBR was created by a team of Scienco/FAST and BioMicrobics water/wastewater process and design engineers, who worked with a control panel expert to centralize all the controls on a single touch screen. Each system operates automatically and is controlled by a three level float switch and timing relays in the control cabinet: BOD less than 5 mg/L, TSS less than 2 mg/L, Turbidity less than 0.2 NTU and Fecal coliform less than 200 CFU/100 mL (without disinfection).

BioBarrier membrane bioreactors are engineered to treat all sources of blackwater and greywater in varying strengths and dependent on daily wastewater flow. The Scienco/FAST custom MarineMBR steel tank provides access for maintenance and removal of the membranes for deep cleaning or replacement. As well as the maintenance on the filtrate pumps and easy to access blower(s), while keeping as much of the equipment below deck and out of sight. All penetrations for air lines, filtrate outflow and electric cables are installed below the main deck. A submersible pump is mounted on the membrane module housing and used as the filtrate pump.

"We are seeing a lot of interest for vessels that sail in sensitive waters and vessels and offshore facilities needing water reuse." Rebori says. "We have several in Alaska and British Columbia waters. Now that we have formally announced their availability, we are getting more inquiries. Within a year, it will likely be another mainstay product line of ours."

Other certifications received for the BioBarrier MBR technology include the NSF/ANSI (National Sanitation Foundation International) Standards 40, class 1; 245 for Nitrogen Reduction; 350 for Water Reuse, and EN12566-3 (European standard for onsite sewage Treatment plants for up to 50 people) and with future approvals, such as with ASTM's ships and marine technology committee (F25), is developing another proposed standard (WK73063).

Scienco/FAST

Harvey Gulf to Equip Eight More Vessels with Battery Systems

Harvey Gulf

Harvey Gulf International Marine announced it will install 10 battery systems on board eight of its vessels as the U.S. based offshore vessel owner continues its efforts to transform its fleet for greener operations.

Harvey Gulf said it plans to install battery systems to convert its 310-foot liquefied natural gas (LNG)-fueled platform supply vessels (PSV) Harvey America, Harvey Liberty, Harvey Power and Harvey Freedom into tri-fuel vessels.

Another four battery systems will be fitted onto three of the company's 300- and 310-foot PSVs—Harvey Supporter, Harvey Hawk and Harvey Condor—with two systems being installed on one of the vessels.

Harvey Gulf's 340-foot multipurpose support vessel (MPSV) Harvey Subsea will also be fitted with two battery systems, making it the only MPSV in the Americas that is dual fuel and battery powered.

Shane Guidry, CEO of Harvey Gulf and QLNG, said, "Now that we have successfully completed sea-trials of the Harvey Energy, America's first tri-fueled vessel utilizing three fuel sources—diesel, LNG and electric battery power—and with battery power being installed on the Harvey Champion, making her dual fueled, my team and I have made the decision to purchase 10 additional battery systems to be installed on our largest PSVs and one of our newest MPSVs."

Harvey Gulf already operates PSVs powered by both LNG and battery systems, a hybrid anchor handling tug for ship tendering service, America's only LNG marine fueling dock, and will soon take delivery of America's first dynamic position class (1) LNG articulated tug and barge (ATB) bunkering vessel.

Installation of the 10 battery systems will enable Harvey Gulf to own and operate the world's largest fleet of combined dual- and tri-fueled vessels, the company said.

"This fleet of vessels will be crucial in assisting our clients' efforts to achieve net carbon zero, and we will continue to listen to them and invest in technology that will assist with their goals," Guidry said.

Guidry indicated that more fleet changes could be in the works: "I have new ideas on the drawing board and should be announcing more transformations to assist our customers with doing our part to achieve net carbon zero."

USCG to Test Autonomous Patrol Boat

Metal Shark

The U.S. Coast Guard (USCG) Research and Development Center (RDC) will run an autonomous patrol boat through its paces to gauge whether the innovative technology installed on board can be used to support personnel in executing Coast Guard missions.

The vessel to be tested is a Metal Shark welded-aluminum 29 Defiant craft, the latest product of the Louisiana-based shipbuilder's "Sharktech Autonomous Vessels" division to be equipped with the SM300 autonomous-command and remote-helm technology from Boston-based autonomous technology developer Sea Machines. The new vessel offers a full range of advanced capabilities including transit autonomy, collaborative autonomy, active ride control and collision avoidance, and remote control vessel monitoring.

During exercises scheduled for October off the coast of Hawaii, the RDC team will test and evaluate the Sharktech vessel's autonomous capabilities for their potential in supporting USCG surveillance, interdiction, patrol and other missions. Following the Hawaii demonstrations, the 29-foot monohull pilothouse vessel will be returned to the RDC's New London, Conn. facility, where it will be used in additional testing to investigate application to various Coast Guard missions.

"As the premier USCG facility performing research, development, test and evaluation in support of the service's major missions, the RDC team is eager to observe Sea Machines' system in action," said USCG's Derek Meier, assistant demonstration director. "The exercises will ultimately help us determine how, when, and if this innovative technology can be used to support personnel who are executing a variety of Coast Guard activities."

"Since the launch of our Sharktech Autonomous Vessels division in 2018 we have been working to position Metal Shark for the autonomy revolution," said Metal Shark CEO Chris Allard. "We are committed to the advancement of autonomous technology, through our relationships with leading autonomy suppliers as well as through our own R&D, and we are engaged with multiple customers, from the USCG, the Department of Defense, and commercial operators."

Sea Machines' Phil Bourque, sales director, said, "[Sea Machines] systems are being rapidly adopted by government and commercial operators alike, offering increases in on-water productivity and predictability, while reducing operational risk."

Vigor Builds Patrol Boats for Jordanian Navy

Fincantieri Marinette Marine and Vigor (Team RB-M) in August delivered two additional Response Boat-Mediums (RB-Ms) to the U.S. Coast Guard. These boats are part of an approved foreign military sale to the Hashemite Kingdom of Jordan through the Department of Homeland Security.

Fincantieri Marinette Marine was the prime contractor and program manager for the project, and Vigor built the vessels at its Seattle facility.

The Royal Jordanian Naval Force (RJNF) plans to operate the new boats from its base in Aqaba, Jordan, for security missions, search and rescue, and drug interdiction along with visit, board, search and seizure operations (VBSS). The 13.6-meter vessels are capable of a top speed of more than 42 knots and have a mission duration of up to 24 hours.

Key features on the vessels include FLIR night vision technology, push knees for added control with VBSS operations, and a composite aft deck hardtop for crew comfort. The vessels utilize shock mitigating seats, Vector-Stick Integrated Control Systems, and port and starboard rescue wells for water retrievals.

Vigor

Team RB-M previously delivered 174 similar boats to the U.S. Coast Guard and is completing six additional boats to the Kingdom of Bahrain.

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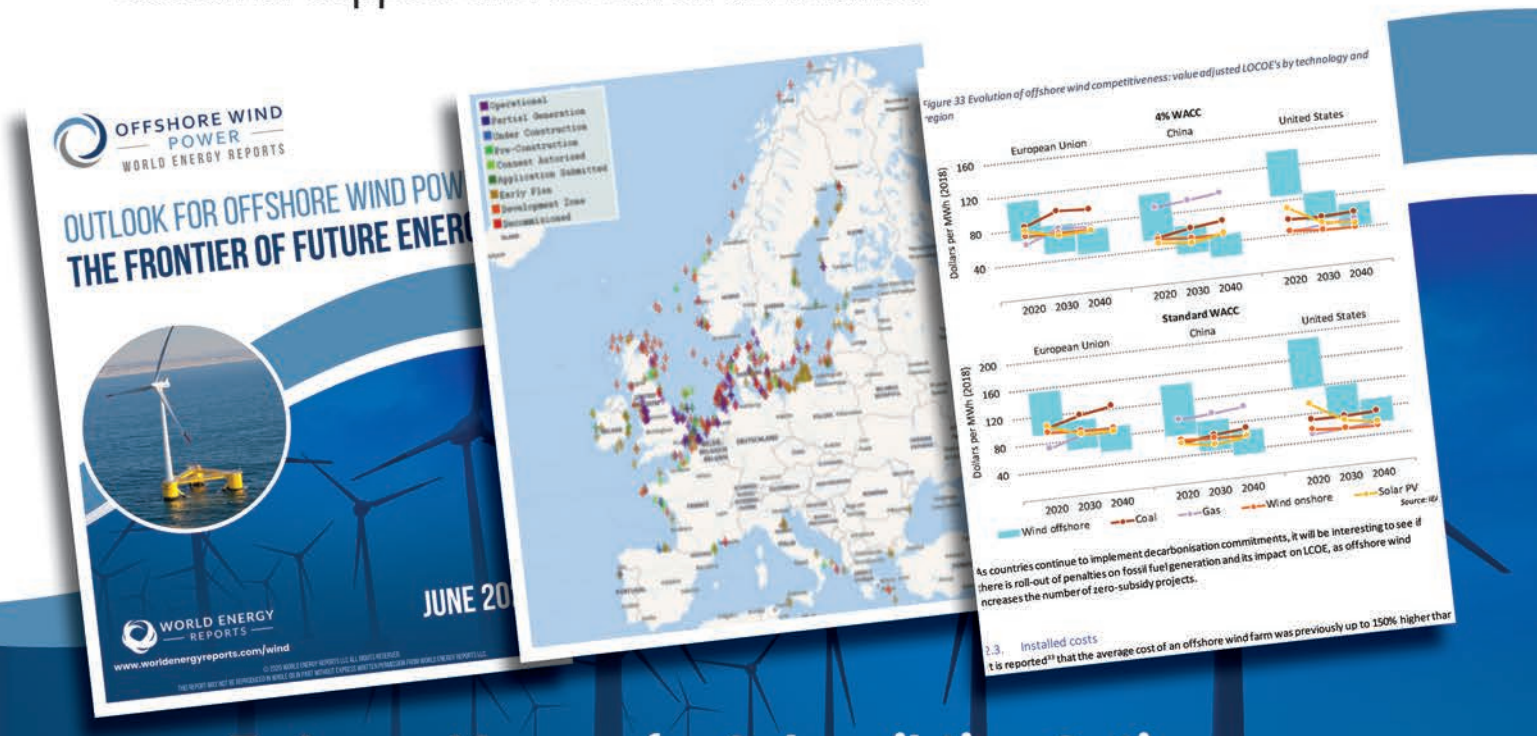

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Blount Delivers Icebreaking Tug Breaker II

Blount Boats

A new icebreaking tugboat built by Blount Boats in Rhode Island has been delivered to the New York Power Authority (NYPA) to work in the Niagara River to help alleviate shoreline flooding and reduce the likelihood of ice limiting the power production at large hydro plants along the Niagara River. The Breaker II joins a fleet of three boats that work every winter to install the Lake Erie—Niagara River Ice Boom—a series of 22 spans of steel pontoons that straddle the mouth of the Niagara River and work to prevent large ice formations from traveling up river.

The Breaker II was custom designed by the Bristol Harbor Group, Inc. for the NYPA for the unique role that it will play in controlling ice buildup in the Niagara River. In August, the boat traveled from the Blount shipyard, through the New York State Canal System and recently arrived at its permanent Buffalo home.

The diesel powered 56- by 18.5-foot shallow draft twin-screw tug is powered by two Caterpillar Tier III series C-9 engines, each producing 375HP at 1,800 RPM. Ship's service power comes from twin Caterpillar Tier III C2.2, 27eKW at 1,800 RPM marine generator sets.

Steel hull plating thickness' range from 3/4 inch, 5/8 inch and 1/2 inch with 1 inch and 2 inch thick skeg plates. Ice Belt plating and plating to 1/3 abaft of the stem is ABS Grade "D" including the 1 inch and 2 inch skeg parts. All other plating is ABS Grade "A" steel.

The vessel's hull, machinery, electrical systems and safety equipment complies with the new USCG Subchapter M – Towing Vessels. This is the first Subchapter M certified vessel built at the Blount shipyard.

The Breaker II's primary job will be to install and remove the Niagara Ice boom, but in consideration of the harsh winter conditions in which it works, it has a bow made with high grade steel for ice breaking capability. Together with the ice boom, the boat will help to diminish the probability of large-scale ice blockages in the river which can cause flooding, damage to docks and shore structures on the Niagara River and reductions of flow to the hydro-electric power plant intakes.

Gil C. Quiniones, NYPA President and CEO, said, "With special features that are especially designed for the unique and dangerous work of the icebreaker tug, we are confident this versatile boat will make the work easier on our crews."

The ability to generate hydropower is dependent on keeping the Niagara River running. During the winter months when sub-zero temperatures produce an ice cover on Lake Erie, keeping the river running can be challenging. Winter winds on Lake Erie frequently push chunks of ice into the upper Niagara River where they flow downstream and tend to jam and can obstruct water intakes for the region's hydroelectric projects. To maintain river flows, NYPA and Ontario Power Generation (OPG) conduct a carefully coordinated ice management operation that includes regular icebreaker patrols, continual surveillance of river conditions and the use of the Lake Erie-Niagara River Ice Boom. The cost of the vessel is shared by NYPA and OPG.

John R. Koelmel, NYPA Chairman, said, "The Breaker II has important work before her, to keep the river flowing so that NYPA can facilitate clean power production. This little boat has a big job and we, at NYPA, are very pleased to have her join our fleet."

"The Breaker II tugboat will play a vital role in generating power and mitigating the impacts of shoreline flooding along the Niagara River," said New York Governor Andrew Cuomo. "In just a few short months, this boat will help install the region's iconic ice boom, which will help prevent large ice flows from inhibiting the generation of clean hydro electricity to power our state, and limit ice build-ups that can cause shoreline flooding."

"It's been a tough couple of years for our waterfront communities with flooding last year and the impact of COVID-19 this year," said Lieutenant Governor Kathy Hochul. "We are committed to finding smart solutions to help mitigate flooding and help our shoreline communities build back better. The new Breaker II tugboat will be used for ice-cutting operations in the Niagara River to keep the river free from ice and prevent ice jams and flooding. This is part of our overall efforts to prepare for future high-water events and help to ensure our communities have the resources they need to be more resilient and sustainable in the future."

USCG National Security Cutter Stone Passes Acceptance Trials

Lance Davis / HII

The U.S. Coast Guard's ninth national security cutter, Stone (WMSL 758), has completed acceptance sea trials, Huntington Ingalls Industries' (HII) Ingalls Shipbuilding division announced.

Having spent two days in the Gulf of Mexico proving its systems, Stone is scheduled to deliver later this year and will be homeported in Charleston, S.C.

Ingalls in Pascagoula, Miss. has delivered eight Legend-class NSCs with two more under construction and one additional under contract.

The technologically advanced Legend-class NSC enables the Coast Guard to meet the demands required for maritime and homeland security, law enforcement, marine safety, environmental protection and national defense missions. NSCs are 418 feet long with a top speed of 28 knots, a range of 12,000 miles, an endurance of 60 days and a crew of 120.

NSC 9 was named to honor Coast Guard officer Commander Elmer "Archie" Fowler Stone, Coast Guard aviator number one, who made history in 1919 for being one of two Coast Guard pilots in the four man air crew who completed the first transatlantic flight in a Navy seaplane.

"This ship, like all of the national security cutters we have delivered, will be capable of undertaking the most challenging Coast Guard missions with great capability and endurance," said Ingalls Shipbuilding President Brian Cuccias.

Bollinger Scores More FRC Builds

Bollinger Shipyards has been awarded contracts to build four additional Sentinel-Class Fast Response Cutters (FRC) for the U.S. Coast Guard, bringing the total number of FRCs awarded to the Louisiana shipbuilder up to 60 vessels since the program's inception. The Coast Guard's Program of Record is to procure 64 FRCs.

All four of the newly awarded 154-foot FRCs will be built at Bollinger's Lockport, La. facility and are scheduled to be delivered in 2022 and 2023. Three of the four will be homeported in Alaska and the fourth in Boston. FRCs have a flank speed of 28 knots, state of the art C4ISR suite, and stern launch and recovery ramp for a 26-foot, over-the-horizon interceptor cutter boat.

"It's a great honor to have the confidence of the U.S. Coast Guard to continue the work we're doing," said Bollinger Shipyards president & CEO Ben Bordelon. "Delivering vessels on schedule and on budget to the Coast Guard during these challenging times shows the determination and resiliency of our workforce."

The long-running FRC program has had a total economic impact of $1.2 billion since inception and directly supports 650 jobs in Southeast Louisiana, Bollinger said. In total, the program has indirectly created 1,690 new jobs from operations and capital investment and has an annual economic impact on GDP of $202 million, according to the most recent data from the U.S. Maritime Administration (MARAD) on the economic Importance of the U.S. shipbuilding and repair Industry. Bollinger sources over

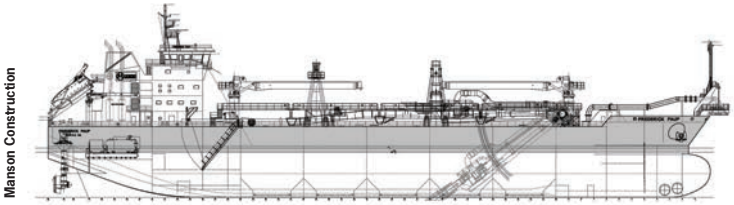
Bollinger Shipyards

271,000 different items for the FRC consisting of 282 million components and parts from 965 suppliers in 37 states.

"While Louisiana's unemployment rate remains above historic averages, we're proud that Bollinger continues to be an economic pillar and job creator in south Louisiana. More than 600 of our 1,500-plus employees have important roles related to the FRC program," Bordelon said. "Without the support of the Coast Guard and Congress for the continuation of this critical program in FY21, the security of these jobs would be thrown into question."

Bollinger supports many government shipbuilding programs in addition to FRC construction. The shipbuilder is participating in industry studies for five government programs, including the U.S. Coast Guard's Offshore Patrol Cutter (OPC) program, the U.S. Navy's Common Hull Auxiliary Multi-Mission Platform (CHAMP) program, the U.S. Navy's Auxiliary General Ocean Surveillance (T-AGOS(X)) program, the U.S. Navy's Large Unmanned Surface Vehicle (LUSV) program and the U.S. Navy's Light Amphibious Warship (LAW) program.

Manson Orders US' Largest Hopper Dredge


Manson Construction

Manson Construction Co. signed a contract with Keppel AmFELS to build a new hopper dredge at the shipbuilder's facility in Brownsville, Texas, the Seattle-based marine contractor announced. The new dredge is scheduled to be fully operational by spring 2023 and continues a dredge building boom currently underway in the U.S.

The self-propelled trailing suction hopper dredger (TSHD) Frederick Paup will be the largest in the United States, representing Manson's single biggest investment in its 115 year history, the company said. The 15,000 cubic yard hopper dredge — designed in collaboration with Hockema Whalen Myers Associates, Inc. of Seattle — has a length of 420 feet, breadth of 81 feet and draft of 28.5 feet. It will be highly automated with a diesel-electric power system, and built to the requirements of classification society American Bureau of Shipping (ABS).

Manson said a U.S. Bank-led syndication is providing financing for the dredge, which will be named after Manson's chairman of the board, Frederick Paup.

"We are proud that it will be U.S. built, U.S. flagged, and U.S. crewed, and will support the U.S. Army Corps of Engineers' mission of keeping the marine transportation highway open throughout the United States," Paup said. "This dredge is the culmination of years of work by our dedicated team and I am honored to bear its name."

When completed, the dredger will operate primarily along The U.S. Gulf and Atlantic coasts.

Mohamed Sahlan Bin Salleh, president of Keppel AmFELS, said the Jones Act newbuild project is its first for Manson and that it will be supported by its local workforce and suppliers across the U.S.

Eastern Lays Keel for Weeks Marine's New Hopper Dredge

Eastern Shipbuilding Group

Eastern Shipbuilding Group conducted the keel laying for the new trailing suction hopper dredge (TSHD) it is building for Weeks Marine.

This new U.S. flag dredge R.B. Weeks, ordered by Weeks Marine in April, is be constructed at Eastern's Allanton Shipyard in Panama City, Fla., for scheduled delivery in early 2023. Steel cutting commenced on August 19.

R.B. Weeks is the second TSHD Eastern is building for the Cranford, N.J.-based marine construction and dredging contractor, following the Magdalen delivered in December of 2017.

The R.B. Weeks is named in honor of Richard B. Weeks, a co-founder of Weeks Marine and husband to Magdalen Weeks, the namesake of the previously delivered sister vessel.

Agnevall

Sperling

Heney

Oytan

Cottrell

Huntington Ingalls Industries

Wärtsilä Names Agnevall CEO

Wärtsilä has appointed Håkan Agnevall as its next president and CEO. Agnevall, who is currently president of Volvo's bus division, will start in his role no later than April 2021, succeeding Jaakko Eskola, who will continue with the company as a senior advisor and executive until he retires in June.

Tidewater Hires Sperling as COO

Vancouver, Wash. based Tidewater Transportation and Terminals has hired Johan Sperling as its new Vice President and Chief Operating Officer.

Heney Joins Hornblower as CMO

Kristina Heney has joined passenger vessel operator Hornblower Group in the newly created role of Executive Vice President, Chief Marketing Officer.

Vinyard Wind Names Oytan Deputy CEO

Sy Oytan has been named deputy CEO of Vineyard Wind, a 50/50 joint venture between Avangrid Renewables and Copenhagen Infrastructure Partners, developers of the first commercial-scale offshore wind farm in U.S. coastal waters. Oytan replaces Alan Hannah, who will return to the U.K.

Hempel Hires Cottrell

Todd Cottrell will take over as the Hempel's new Group Vice President for North America and a member of the company's Operational Management Board.

HII Building Unmanned Systems Hub

Huntington Ingalls Industries is building a new hub for unmanned systems prototyping, production and testing to meet growing demand from the U.S. Navy for autonomous and uncrewed systems. The purpose-built Unmanned Systems Center of Excellence will include two buildings totaling over 150,000 square feet constructed on a 20-acre campus in Hampton, Va.

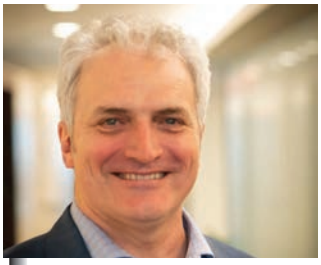
Licnikas Joins Laborde Products

Laborde Products welcomed Peter Licnikas to its marine sales team. He is responsible for representing Mitsubishi Marine Engines along the East Coast as well as Laborde Power Products, which includes Mitsubishi and FPT Barge Power Units and Marine Generators.

Austal Grows US Footprint

Shipbuilder Austal USA has completed the purchase of waterfront


Licnikas


Hilburn


Coolbaugh


Ward

land, buildings and an existing dry dock along the Mobile River to enhance its new construction and service business lines.

Hilburn Returns to Crowley

Bleu Hilburn is returning to Crowley Solutions as vice president of business development for all government services.

Konecranes, Cargotec to Merge

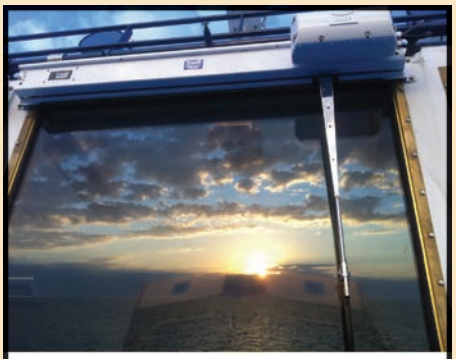
Finnish engineering firm Konecranes and cargo handling machinery maker Cargotec plan to merge to help speed up innovation and reap savings. The companies said they had signed a plan under which Konecranes would be folded into Cargotec.

Coolbaugh Named Ohmsett Facility Manager

Applied Research Associates, Inc. (ARA) announced Dr. Tom Coolbaugh has joined the team as the Program/Facility Manager for Ohmsett – The National Oil Spill Response Research & Renewable Energy Test Facility.

Ward Tapped as PSG CEO

Jeff Ward has taken over as CEO of Pure Safety Group, an independent height safety product development, manufacturing and training company.



In-Mar Solutions: Wynn Marine Type C & Type D, Heavy Duty Straight Line Wipers

Wynn Type C (internal motor) and Type D (external motor) Straight Line Wipers offer the most advanced design of linear action window wiping systems for marine and other specialized applications. Optimum window coverage can be achieved and enhanced by utilizing a twin-bladed or dual-arm/blade design.

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PEMA Skymaster PRO

Pemamek Ltd. unveiled the new welding positioner series, PEMA Skymaster PRO. The newly released welding positioner represents a fusion of modern digitality and Pemamek's signature positioning technology. The PEMA Skymaster PRO series expands the handling capabilities of previous Skymaster positioners with new intelligent PRO- software that enables pre-programming of work cycles and handling positions. Thanks to the visual software tool, the operator gets a better understanding of the overall production, improves manufacturing capacity, and saves time especially in serial production.

Adjustable Telescopic Spreader Beam

Harrington Hoists' new HATSB model Adjustable Telescopic Spreader Beam is designed for outdoor construction or for places where headroom is not limited. The beam will accommodate various size loads and uses an upper rigging spread between two lift points which adds stability to the lift. The Adjustable Telescopic Spreader Beam is available from 2 through 40 ton capacities with outside spreads that adjust from a minimum of 4 to 6 feet to a maximum of 12 to 20 feet as standard. It also comes standard with a pair of heavy-duty swivel hooks. Additional sizes and capacities or additional lift points and hardware are available upon request.

IntelliSite

Kidde Fire Systems has launched a real-time, cloud-connected remote monitoring solution for gaseous fire suppression systems. The IntelliSite system allows users to monitor the status of a portfolio of fire control units in real time across multiple locations. The IntelliSite system allows users to monitor Kidde Fire Systems addressable fire-suppression control units via computer, tablet or smartphone. Using secure cellular connectivity, control unit status along with the status of all associated detection devices and supervised suppression systems is at the user's fingertips, providing information-based decision-making.

jGun DIGITAL Pneumatic Torque Tool DJ-6.5

HYTORC's new jGun DIGITAL Pneumatic Torque Tool DJ-6.5 edition gearbox is designed to fit into tight spaces while providing the highest levels of torque needed (capacity up to 6,500 ft-lbs). The addition of a new whip hose with a locking air regulator increases the tool flexibility without the need for conventional Filter/Regulator/Lubrication (FRL) systems. The tool features a rugged planetary gearbox, aerospace aluminum housing, locking air regulator, digital readout, on-board processor, built-in torque adjustment and USB charging port.

Three-in-one Boiler

PARAT Halvorsen designed and developed a new MCS Combined Exhaust Gas / Fuel-Fired / Electrical Boiler with a focus on reducing emissions. PARAT Halvorsen added up to 600kW electrical elements to its combined boiler, and now three different heat sources gives the vessel the possibility to produce steam from shore power to reduce emissions at harbor, optimize the power generator load during transit and burn fish oil. The new boiler will give the vessel great flexibility to switch between heat sources when needed.

NSF 61 Certified Valves

Asahi/America, Inc. announces the NSF 61 certification of its CPVC Type-21 ball valves and CPVC ball check valves in sizes 1/2" through 4". Type-21 ball valves with CPVC bodies and EPDM or FKM seats and seals, as well as ball check valves with CPVC bodies and EPDM or FKM seats and seals meet the requirements of NSF/ANSI/CAN Standard 61 – Drinking Water Components.

Diverter Y Valve

Many polymer marine valves will only accept unique fittings. Not so with the new full-flow Diverter Y Valve from Raritan Engineering. It'll take any standard 1-1/2" NPT fitting commonly available, reducing costs and installation time. The body of the Raritan Diverter Y Valve is made from durable, high-strength ABS plastic. A removable handle satisfies No Discharge Zone requirements. Available with or without 1-1/2" barb fittings, any port of the Raritan Diverter Y Valve is easily configured as the input.

Rivertrace

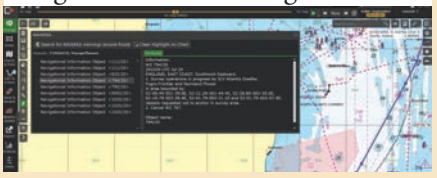
Water quality monitoring technology developer Rivertrace established a new, web-based calibration portal that will enable complete transparency of compliance and inspection paperwork related to water monitoring equipment. The free-to-access digital portal was developed by Rivertrace in conjunction with development partner Intellore. Hosted on the AWS (Amazon Web Services) cloud, the portal can be retrieved at any time via desktop and mobile browsers, allowing Rivertrace's network of staff, customers, OEMs and agents to access information relating to the entire range of Rivertrace monitoring products, including calibration forms, product manuals and certification.

FuelNet 'Gen 6'

FUELTRAX launched the latest features of its cloud-based portal, FUELNET 'GEN-6', as its sixth major release. FUELNET delivers decision-ready reports that can be utilized to make quick decisions during operations. The company reports a +/-0.15% accuracy and remote troubleshooting available 24/7 from Houston, FUELTRAX consumption tracking provides a complete picture of operations minute-by-minute. FUELNET GEN-6 will also include all-new dashboards; new interactive charts, graphs, plots and map views; and performance improvements.

NAVAREA Warning Service for C-MAP IMS

C-MAP announced a new service, along with a number of improvements and features to its existing, back-of-bridge voyage planning station. The addition of NAVAREA Warnings is one of many new features and improvements that are available with the IMS 2.2.2 release. Compared to the standard, manual process for working with the World-Wide Navigational Warning Service (WWNWS) data, C-MAP's NAVAREA Warnings Service delivers a convenient, automated and continually updated data set fully integrated with the crew's existing voyage planning and weather routing workflow.



Optimus 5000 EPS

Dometic's Vancouver facility received RINA Approval and Certification for its Optimus 5000 Electronic Power Steering System (EPS), engineered for inboard vessels ranging from 40 to 100-plus feet in length. While typical steering systems use 380-volt AC power supplies with continuously running three-phase electric motors, Dometic's 24-volt DC system delivers on-demand hydraulic power, providing shipbuilders with significant savings in cost, complexity and weight. The system's design and CAN bus communication network simplify the wiring requirements.

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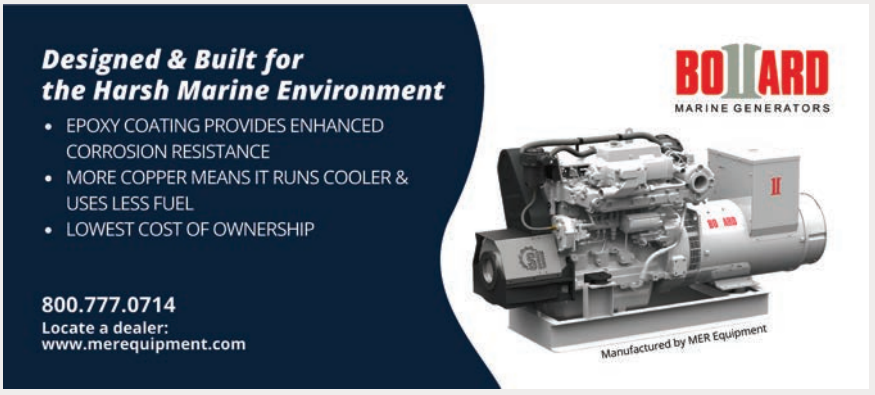

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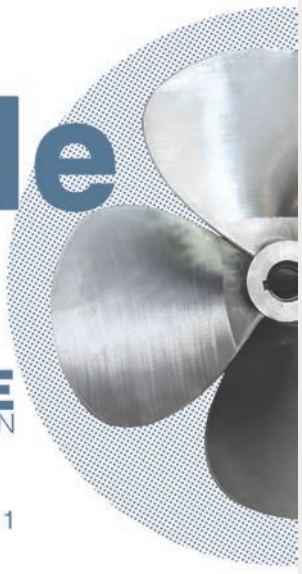

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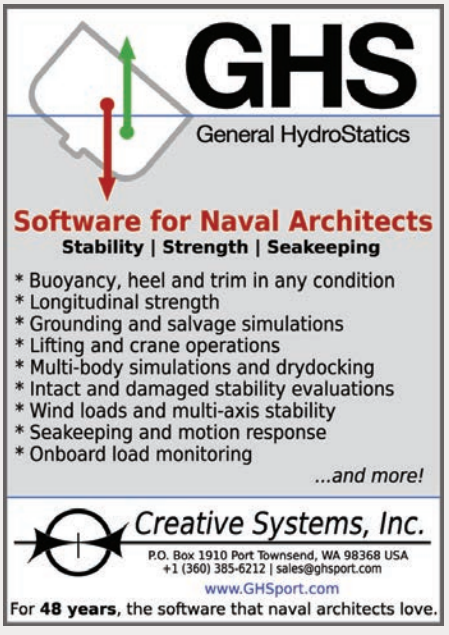

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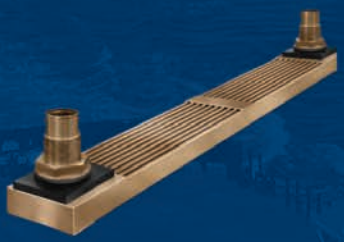

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