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Volume 34 • Number 11

Marine News

NOVEMBER 2023

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Crowley

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MARAD

On the Cover

Empire State is the lead vessel in a series of five new ships purpose-built by Philly Shipyard for training cadets at America's state maritime academies. Delivered to the U.S. Department of Transportation's Maritime Administration (MARAD) under its National Security Multi-Mission Vessel (NSMV) program, Empire State will serve SUNY Maritime College.

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DEDICATED NAVAL ARCHITECTS

Editor's Note

Eric Haun, Editor,
haun@marinelink.com

Give credit where credit is due. MARAD, TOTE Services, Philly Shipyard and all parties involved in the National Security Multi-Mission Vessel (NSMV) build program have knocked it out of the park.

Officially handed over to MARAD in September, the series-leading NSMV, Empire State, was "delivered on time, as designed and at a fixed price for advancing the education of future merchant marine officers," MARAD said.

The purpose-built vessel gracing this issue's cover—built to serve SUNY Maritime College—and its four sister ships scheduled for delivery through 2026 for the other state maritime academies will provide a top-notch platform for training the nation's future mariners, replacing a fleet of aging training ships that are well beyond out of date. And, as an added benefit, the new vessels are designed to support humanitarian assistance and disaster relief missions when called upon.

Notably, the NSMVs are the first government ships built using the Vessel Construction Manager (VCM) contract model, which saw TOTE Servies hired as construction manager to take responsibility for shipyard selection and ensure that commercial best practices are utilized to deliver the ships on time and on budget. And it worked!

Following this success, interest is growing to apply this model to other U.S. government shipbuilding programs to reduce costs, accelerate delivery times and build more vessels. Here's to hoping it will be done.

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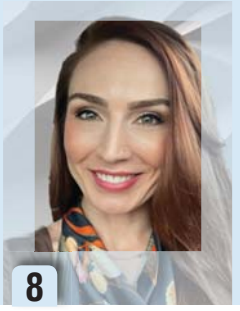
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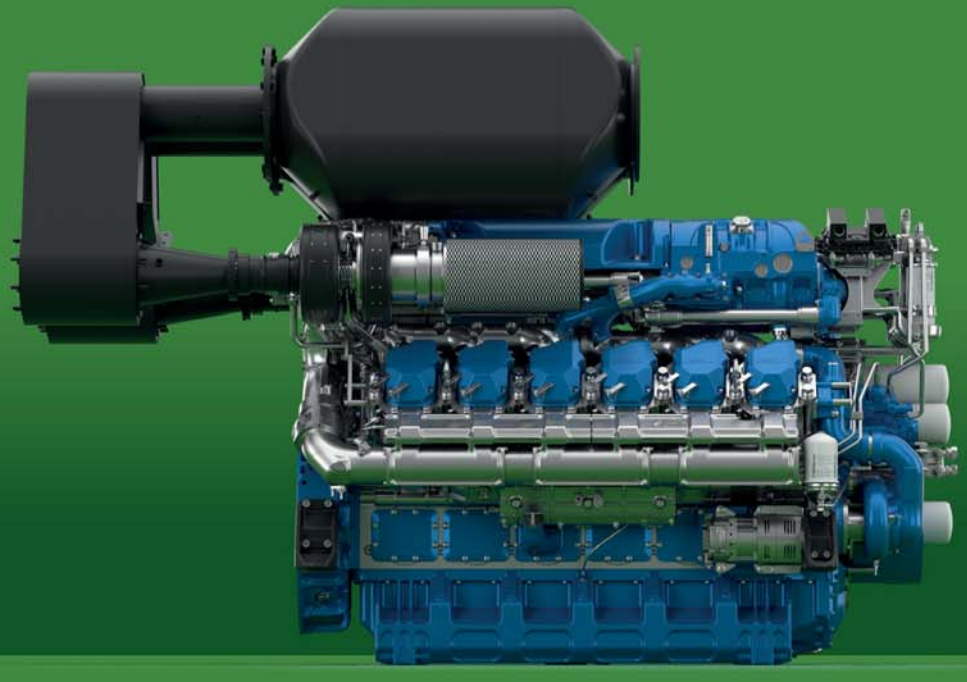

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By the Numbers

Dredge Construction Booming in Competitive US Market

A dredge building boom that has been underway in the United States for several years is still going strong as the market remains highly completive for solid project workloads in both the public and private sectors.

According The Mike Hooks Report, an analysis of the FY22 U.S. federal dredging market compiled in September 2023 by Michael Gerhardt, senior director of government affairs at Mike Hooks, LLC, 52 Jones Act dredging companies were awarded federal dredging contracts in FY2022. On average there were three bidders per project, with 20 projects receiving five or more bidders.

Seventy-two percent of the time, the private sector industry winning bid was lower than the Independent Government Estimate (IGE); and 95% of the time, the private sector industry winning bid was lower than the Government Estimated Awardable Range (GEAR), which is IGE + 25%. When compared to the IGE, 59 projects were lower by more than 10%, 27 projects were lower by more than 25% and 15 projects were lower by more than 40%.

"What does this mean? It means that the U.S. dredging industry (private sector dredging companies) is fiercely competitive and is delivering a service that saves the federal government, and therefore the taxpayer, hundreds of millions—$670 million in FY22 alone (when compared to the GEAR), and this trend happens year over year," Gerhardt said.

The U.S. federal dredging market bid out to U.S.-flag Jones Act private sector dredging contractors has grown 408% in value since 1993. In these 30 years the subset of hopper dredging contract awards has increased 620%, Gerhardt added.

"While there have been peaks and valleys over this time period due to funding and level of need, there has been a steady climb," Gerhardt said. "On average the hopper dredging market, which has fluctuated between $300 million and $700 million over the past seven years, annually accounts for approximately 30% of the total market."

Gerhardt noted that his report only details federal dredging projects, and that work in the private sector has also been solid.

To help meet the steady demand, the industry has invested heavily in new construction of U.S. owned, built and crewed Jones Act dredges: over $2.5 billion over the past five years. Newbuild dredges have been "rolling off the blocks", said William P. Doyle, CEO, Dredging Contractors of America. Doyle said he expects this trend will continue into the foreseeable future, noting dredging companies have also been investing in other equipment to support their activities, such as cranes, barges, tugs, scows, tender boats, survey vessels, boosters, pipelines, pontoons, etc.

"The U.S. Jones Act dredging industry is not just highly competitive and in the midst of the largest fleet capitalization ever, but it is reliable. The foreign entities have a tendency to overpromise and underperform— then walk away when times get tough," Doyle said.

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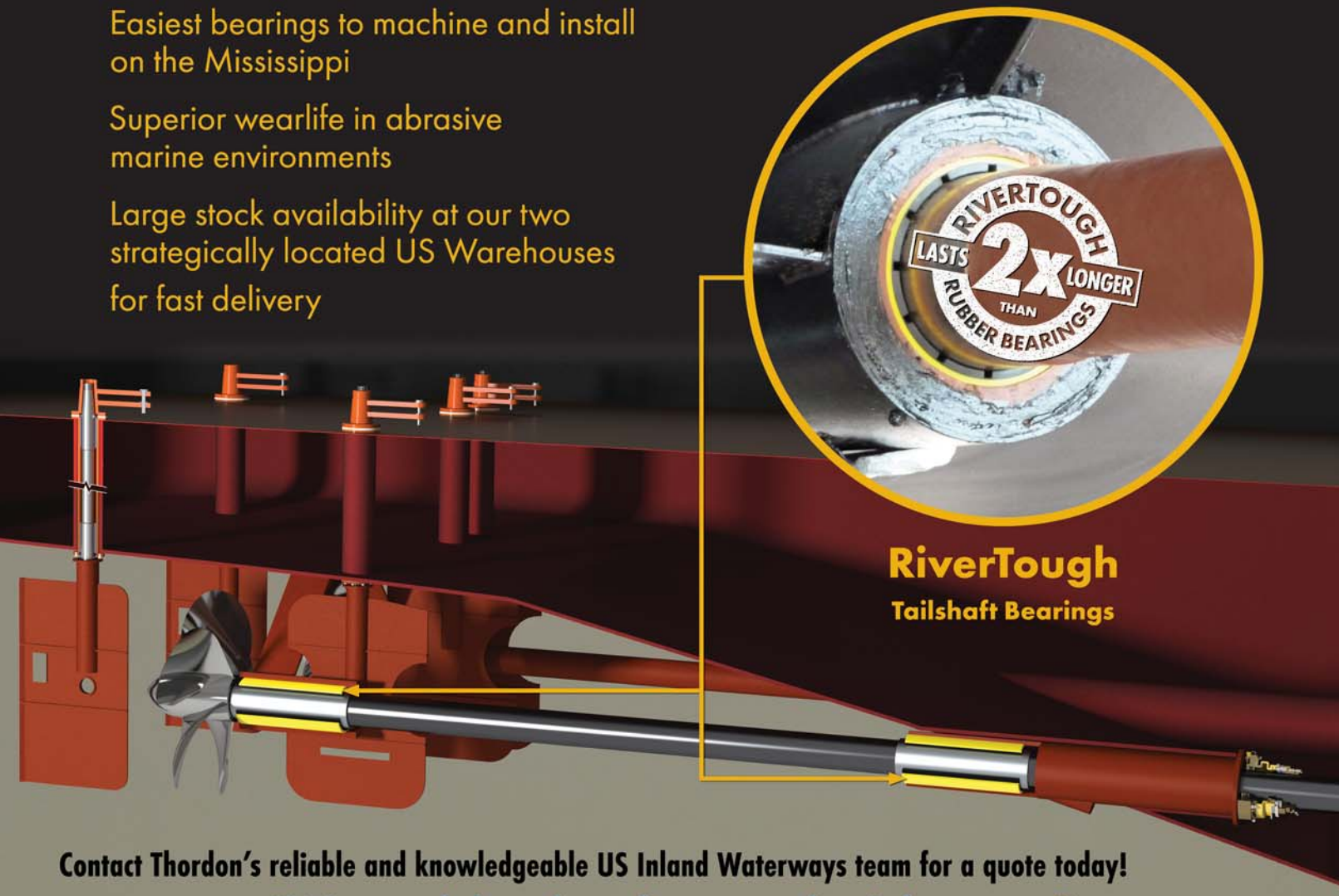

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By the Numbers

Jones Act Dredging Commercial Fleet Orderbook Over Past Five Years					
Company	**Dredge Name**	**Dredge Type**	**Capacity**	**Shipyard**	**Status**
Manson Construction	Frederick Paup	Hopper	15,000 cy	Keppel AmFELS (TX)	Expected delivery Q4 2023
Cashman Dredging	Mighty Quin	Hopper (T&B)	4,000 cy	Feeny's Shipyard (NY)	In service April 2023
Great Lakes Dredge & Dock	Amelia Island	Hopper	6,500 cy	Conrad (LA)	Expected delivery Q2 2025
Great Lakes Dredge & Dock	Galveston Island	Hopper	6,500 cy	Conrad (LA)	Expected delivery Q2 2024
Weeks Marine	RB Weeks	Hopper	8,550 cy	Eastern (FL)	In service May 2023
Callan Marine	General Bradley	Cutter Suction	28-inch	Halimar (LA)	In service April 2022
Callan Marine	General Arnold	Cutter Suction	32-inch	C&C (LA)	Expected delivery Q4 2023
Callan Marine	General Marshal	Cutter Suction	18-inch	DSC (LA)	In service April 2023
The Dutra Group	ES-15	Split Hull Dump Scow	6,000 cy	Corn Island (IN)	In service 2019
The Dutra Group	MS-16	Split Hull Dump Scow	6,000 cy	Gunderson (OR)	In service 2022
The Dutra Group	CB Harry S	Clamshell	-	Conrad (LA)	In service 2022
The Dutra Group	TBD	Hopper	10,464 cy	TBD	In final development
Callan Marine	Admiral Nimitz	Hopper	16,000 cy	TBD	Shipyard tender package released
Mike Hooks	Lorraine Hooks	Cutter Suction	27-inch	Mobile Pulley Works (AL)	In service June 2023
Curtin Maritime	DB Avalon	Clamshell	-	Conrad (LA)	In service 2022
Cashman Dredging	TBD	Hopper	6,500 cy	Curtin	Shipyard selection phase
Callan Marine	General MacArthur	Cutter Suction	32-inch	C&C (LA)	In Service 2020
Weeks Marine	JS Chatry	Cutter Suction	30-inch	C&C (LA)	In Service 2019
Great Lakes Dredge & Dock	Ellis Island	Hopper	16,800 cy	Eastern (LA)	In Service 2018
Weeks Marine	Magdalen	Hopper	8,550 cy	Eastern (FL)	In Service 2018
Manson Construction	Robert W White	Cutter Suction	30-inch	Halimar (LA)	In Service 2018
Curtin Maritime	Crown Point	Dump Scow	6,000 cy	Gunderson (OR)	In service 2022
Curtin Maritime	Inspiration Point	Dump Scow	6,000 cy	Gunderson (OR)	In service 2022
Curtin Maritime	Sand Point	Dump Scow	6,000 cy	Gunderson (OR)	In service 2022
Marinex Construction	Wadmalaw	Cutter Suction	30-inch	Detyens (SC)	In service 2021
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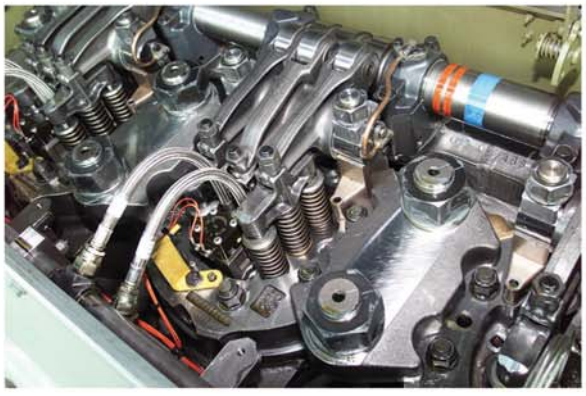

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Frank Manning

President & COO, Diversified Marine, Inc.

Frank Manning has quickly risen through the ranks during his eight years in the shipyard business, today serving as president and COO at Diversified Marine, Inc. (DMI) in Portland, Ore. Crucial along the way has been a passion for the business itself and the people that make it all possible.

Diversified Marine, Inc.

"The first day I walked in a shipyard I knew that I was in the right industry for me," Manning said. "DMI has always been a relationship-based business. All of our customers are close friends, and we have relationships that are second to none," he said. "Knowing the crew, the people that operate the boat, and getting feedback to try to develop a better product, this was all super attractive to me."

Manning said his attention to the relationships side of the business is a pillar to his leadership philosophy. "One thing that stuck out to me early on with [DMI CEO] Kurt Redd—and learning from Kurt was key—his father, Earl, had always told him relationships are the most important thing. And the way you maintain those is to do what you say you're going to do."

For Manning and the team at DMI, whose primary business is building tugboats for customers throughout the U.S., this can sometimes mean coming up with new ways to solve challenges bound to arise in the shipbuilding industry.

The yard is situated in what Manning described as "an odd location for building boats", nestled between a road and the Columbia River, with a relatively small amount of land to work with. "As far as I know, we're the only shipyard in the country that actually assembles a boat on a drydock," Manning said. "And throughout our history, there has been a lot of good one-off examples of fighting through challenges, figuring out whatever we have to do to deliver for our customer."

When DMI was contracted to build its first tractor tug–Wynema Spirit, delivered to Brusco Tug & Barge in 2000—the shipyard didn't have a drydock, so it built the vessel on a barge. Once completed, both the new tug and the barge were transferred onto a large drydock, and DMI cut holes in the barge in order to sink it with the drydock to float the new vessel.

"To me, that serves as a testament," Manning said. "If we have an opportunity to perform for a customer, we will do whatever it takes to overcome any challenges."

As president & COO, Manning leads business development for DMI as well as day-to-day operations and yard improvement strategies. "We've been investing a lot in new systems and processes to move our company and bring it up to speed with modern technology." he said. "Among my top priorities right now is developing our processes internally to be more organized. Lately, we've had issues with lead times and price increases, so we're making sure we have systems to purchase parts at the right times in the project. We've revamped our inventory and receiving processes as well as our QA/QC (quality assurance and quality control) processes."

At the end of October, DMI performed sea trials for Artemis, a new Robert Allan Ltd. RApport 2500 tug for Brusco, to be chartered by Crowley. It is also currently building two Robert Allan Ltd. RAscal 2000s for Brusco. "I'm really excited about that model. It's a 65-footer that should be a 45- to 50-ton-bollard-pull boat," said Manning, who is also heavily involved in design and engineering.

With new tests and ratings coming out for the Caterpillar C32, Manning said he's hopeful to get a 60-ton boat in a 65-foot hull. "It's two thirds of the cost of the bigger

model that we're building now. For ports where you don't need 95 tons, that makes a lot of sense. We're pretty bullish on [the RAscal] model."

After the Brusco builds, DMI will construct a RApport 2500 for Shaver Transportation, following the delivery of another tug, Shaver, to the company in 2022. The builder also very recently inked a deal to build a pair of RApports for Ursa Major Marine Holdings.

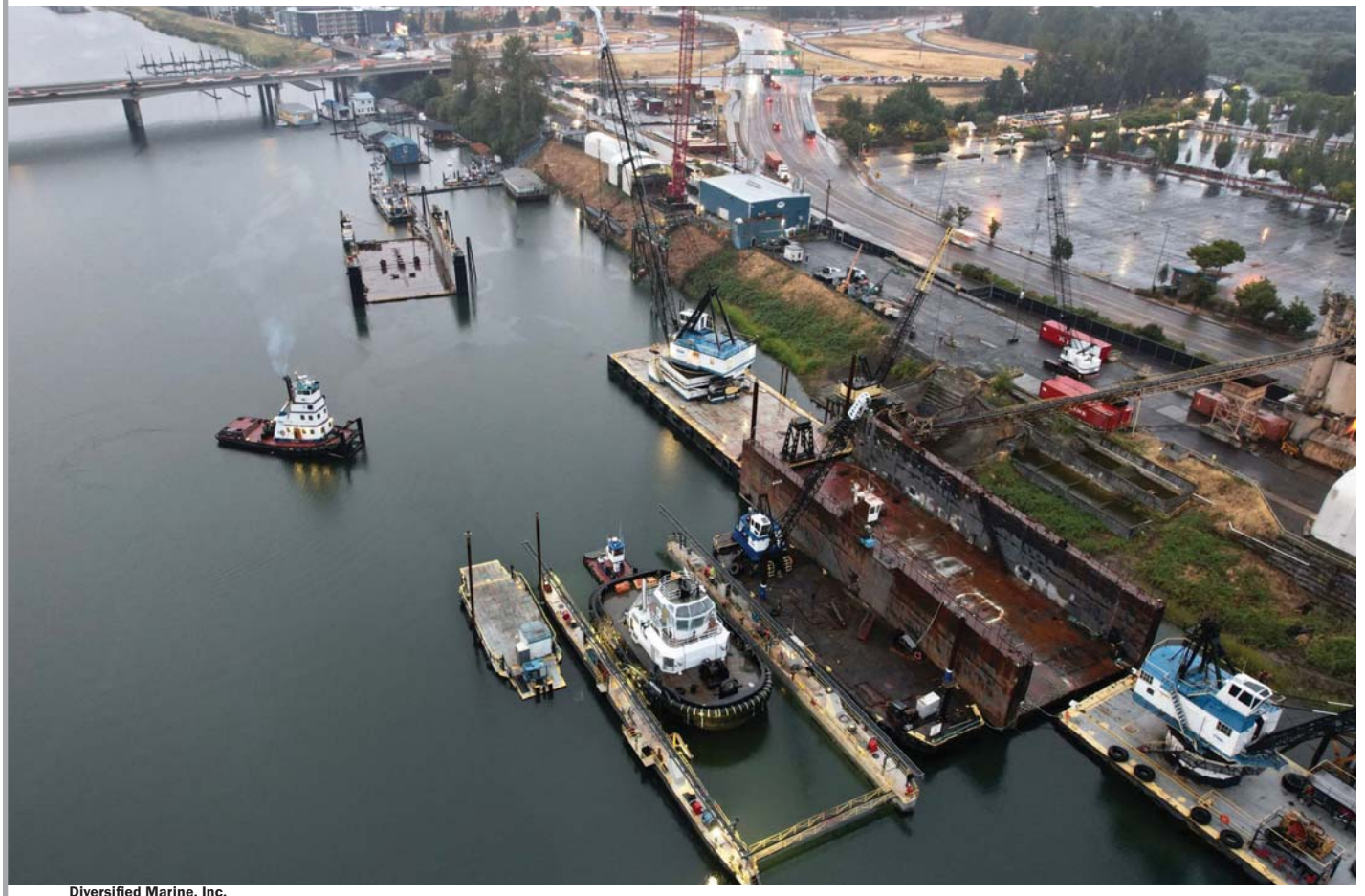
"We've had a lot of success with the RApport 2500," Manning said, noting a desire to continue building them, even looking at different hybrid options. "Once we get through our current backlog, we'll have built seven. . . We're working with Berg on a cool concept for a PTO (power take off) driven generator that charges battery, so you can remove a diesel generator from the tug."

In addition to its primary business building tugs, DMI also has a repair division as well as a marine services arm that runs a fleet of seven tugboats and a number of barges for salvage and other work on the river.

Not only do these segments help DMI ride out dips in the cyclical shipbuilding industry, they also enhance its main product offering. "The repair and operation side definitely helped us build better boats," Manning said. "Getting feedback and ideas from captains and crew, and bouncing them off customers, it all works really well. And obviously, repairing boats—seeing what works and what doesn't—gives another perspective."

Throughout the company, people are key. "Developing a strong team that's willing, committed and bought-in, and that we take care of, that's the core of what we do." Manning said.

"One thing that I'm big on here, just from my experience, and being in yards up and down the West Coast, is developing the next generation of shipyard workers," Man-



Diversified Marine, Inc.

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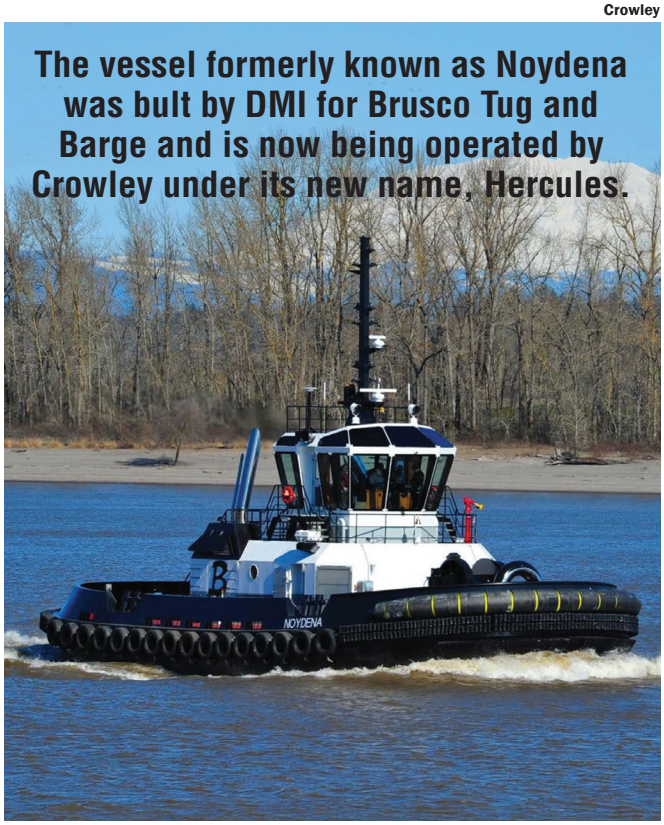
ning said. “Over my time here, we’ve dropped the average age of a worker by six years over three and a half years. So that’s including our workforce aging by three years over that time. We’re big on investing in attracting the right people from the next generation, and then developing them with skills and opportunities here.”

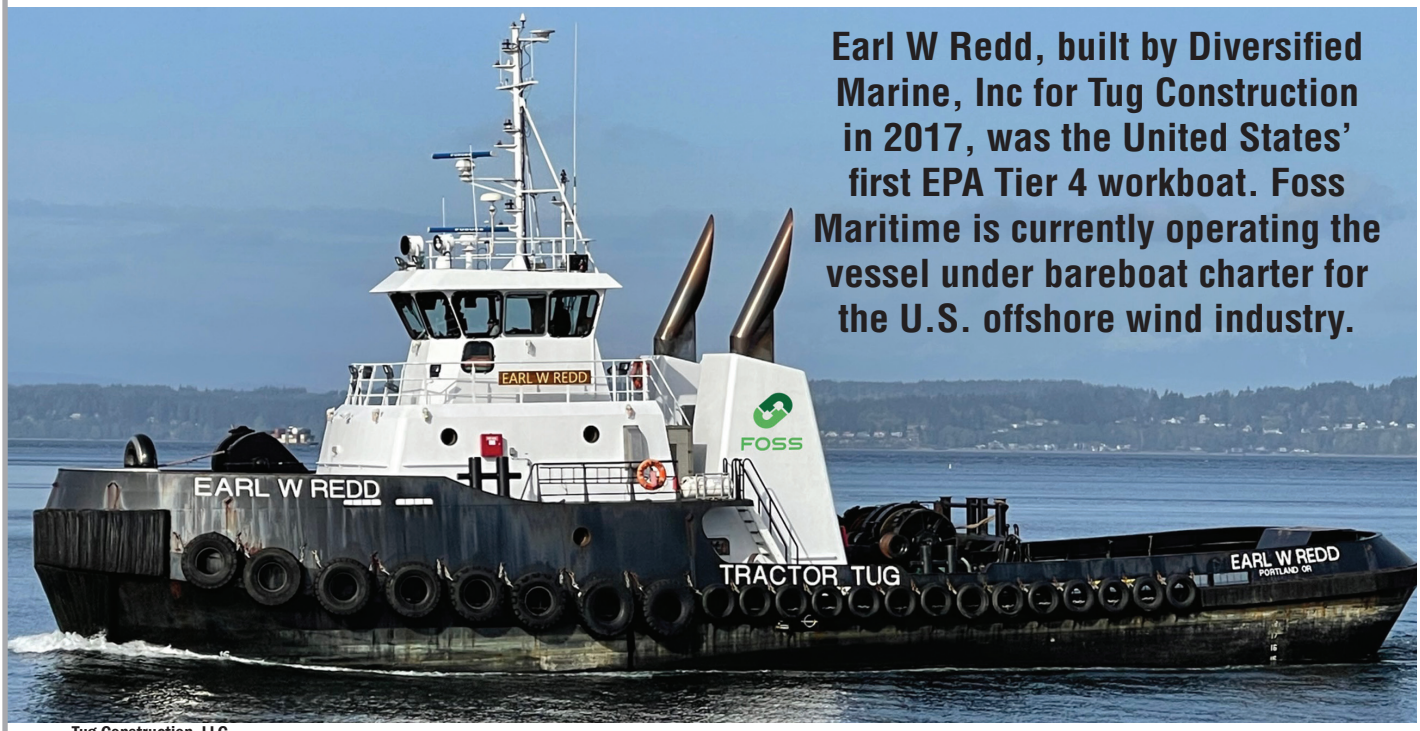
DMI has partnered with local schools including Portland Community College (PCC), giving feedback to help develop their maritime specific welding program. The relationship has led to the hiring of many PCC graduates. “Twenty-five percent of our workforce is under 25 right now. We’re getting a lot of younger people that like the culture here and want to learn a skill, and we’re developing them. That’s something I’m really excited about. We’ve got a great young group here,” Manning said. “It all clicks when a boat delivers, and they get to see that boat sail off the dock under his own power.”

As the company builds up its workforce, it is also looking to scale up production. “We want to get to four boats a year; we’re currently at two,” Manning said. “We’re going to have our larger hulls built at another yard in Portland, and we’ll do all the outfitting, piping systems and machinery installations here at Diversified.”

Crowley



The vessel formerly known as Noydena was built by DMI for Brusco Tug and Barge and is now being operated by Crowley under its new name, Hercules.



Earl W Redd, built by Diversified Marine, Inc for Tug Construction in 2017, was the United States’ first EPA Tier 4 workboat. Foss Maritime is currently operating the vessel under bareboat charter for the U.S. offshore wind industry.

Tug Construction, LLC

Column

Legal Beat

Bringing the Capital Construction Fund Program Ashore

By James Kearns, Special Council, Jones Walker LLP

On May 5, 2023, the White House announced that the Environmental Protection Agency (EPA) was "taking the next step to invest $3 billion in its Clean Ports Program to fund zero-emission port equipment and technology and to help ports develop climate action plans to reduce air pollutants, improve air quality and public health in neighboring communities, and advance environmental justice." That "next step" was the issuance of a Request for Information to inform EPA of the availability of zero-emission technologies in the heavy-duty vehicle and port sectors in the agency's development of funding programs under the Inflation Reduction Act of 2022. EPA has announced that it anticipates this new funding opportunity will become available for application through a notice of funding opportunity (NOFO) released in late winter 2024.

The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, substantially increased funding for the Ports Infrastructure Development Program (PIDP) that is administered by the U.S. Department of Transportation through its Maritime Administration (MARAD). Through the IIJA, $450 million was provided to the PIDP for each of five consecutive fiscal years (FYs) beginning with FY 2022. The Consolidated Appropriations Act, 2022, added more than $230 million to this amount for that fiscal year, and the Consolidated Appropriations Act, 2023, added more than $212 million to the base amount, providing a total of more than $662 million for FY 2023. The NOFOs that have been issued for this increased funding have emphasized the importance of demonstrating that a project for which funding is requested will mitigate the emission of greenhouse gases, including the cargo handling equipment to be purchased for the project.

While funding programs such as those of EPA and MARAD are important in furthering the policy goals they are intended to support, history has shown that the continued and regular authorization and appropriation of funds by Congress for such programs cannot be relied on, with recent developments on Capitol Hill being only the latest example of this. At the same time, it is reasonable to expect that the pressure on ports and marine terminals to achieve the policy objectives that gave rise to these programs will continue and even increase, even if the funding of grant programs does not keep pace.

To help address this situation and other funding needs of ports and marine terminals, in late July of this year, Representatives Mike Ezell (R-Miss.) and Troy Carter (D-La.) introduced in the U.S. House of Representatives H.R. 4993, a bill to extend the Capital Construction Fund (CCF) program administered by MARAD to landside marine facilities.

For those not already familiar with the CCF program, since its creation in the Merchant Marine Act of 1936, it has allowed owners and operators of eligible U.S.-flag vessels to defer federal taxes on income from vessel operations and

gains from vessel sales by excluding from taxable income any amounts from such sources that are deposited into a CCF account established through a contract with MARAD. Earnings from the investment of deposits in a CCF account are nontaxable while in the account. Until recently, withdrawals from a CCF account were tax-free only if they were used for the construction or reconstruction in the United States of U.S. flag vessels that are operated in the U.S. foreign, Great Lakes, noncontiguous domestic, or short-sea transportation trades. Even with these geographical restrictions, today there is more than $2.5 billion on deposit in CCF accounts held by more than 140 fundholders who own or operate vessels in those trades. The CCF program is also available to the owners and operators of vessels engaged in the fisheries of the United States, but this part of the CCF program is separately administered by the U.S. Department of Commerce.

Legislation passed in December 2022 removed the geographic trading restrictions so that qualified withdrawals may now be made from a CCF account for the construction or reconstruction of U.S.-flag vessels that engage in the "foreign or domestic trade of the United States," which would include vessels operated on U.S. inland waterways. This has the potential to benefit the owners and operators of vessels on the inland waterways in a number of ways, several of which have been discussed in this publication and elsewhere. More detailed discussions of the specific possibilities will be possible when MARAD develops the regulations to reflect the expanded CCF program.

As proposed in H.R. 4993, the CCF program would extend to cargo handling equipment and marine terminal operators tax treatment analogous to how the program currently applies it to vessels and their owners and operators. That is, the bill would allow the operator of a marine terminal in the United States to obtain the tax deferral benefits of a CCF account for the purpose of providing replacement, additional, or reconstructed cargo handling equipment at marine terminals in the United States.

The bill defines "marine terminals" to mean wharves, bulkheads, quays, piers, docks, and other berthing locations as well as adjacent storage or other adjacent areas and structures associated with the primary movement of cargo or materials from vessel to shore, or from shore to vessel. These include structures that are devoted to receiving, handling, consolidating, loading, or delivering waterborne shipments and areas devoted to the maintenance of the terminal equipment.

The bill defines "cargo handling equipment" to mean any vehicle or land-based equipment, and the associated marine terminal or port landside infrastructure, used at a marine terminal to lift or move cargo. The cargo handling equipment would need to be either manufactured in the United States or, if manufactured outside the United States, not produced in the United States in sufficient and reasonably available quantities of a satisfactory quality as determined by the marine terminal operator.

The maximum amount deposited in a CCF account in any taxable year would be the sum of (1) that portion of the fundholder's taxable income for that taxable year attributable to the operation of a marine terminal in the United States, (2) the amount allowable as a depreciation deduction for the taxable year for cargo handling equipment, (3) the net sales or insurance proceeds from the disposition of cargo handling equipment, and (4) the receipts from the investment of amounts held in the fund. The fundholder's taxable income for the taxable year would be reduced by amounts deposited under the first category. Gain from a transaction described in the third category would be excluded from taxable income if the net proceeds from the transaction are deposited into the fund. Gains or losses from the investment of amounts held in the fund would not be taken into account in determining the fundholder's taxable income.

Withdrawals from a CCF account would be "qualified" if made to acquire, construct, or reconstruct cargo handling equipment or to pay the principal of indebtedness incurred in the acquisition, construction, or reconstruction of cargo handling equipment. In general, qualified withdrawals would not be subject to tax, but the tax basis of the equipment so acquired would be reduced by the amounts of such qualified withdrawals.

The bill expressly prohibits withdrawals from a CCF account for fully automated cargo handling equipment that is remotely operated or monitored with or without the exercise of human intervention or control if the Secretary of Transportation determines that such equipment would cause a net loss of jobs within a marine terminal. The bill also expressly prohibits withdrawals from a CCF account to purchase cranes manufactured in the People's Republic of China.

The bill has been referred to the House Committee on Transportation and Infrastructure's Subcommittee on Coast Guard and Maritime Transportation. As a practical matter, the introduction of the bill will likely serve for now mainly as a way to get a conversation started about the concept of using the CCF program in this way. Articles such as this in other publications and endorsements from industry representatives such as the National Association of Waterfront Employers suggest that the bill is, in fact, serving this purpose. The proposal also offers another example of how a program can further policy goals without being dependent on the vicissitudes of politics on Capitol Hill. The success the program has had for nearly 90 years is evidence of the soundness of this approach.

Column

Sustainability

Navigating Sustainability: Charting a Way Forward

By Jennifer Carpenter, President & CEO, The American Waterways Operators

You can feel it in the air, and increasingly on the water: a steady increase in momentum toward a global economy that prioritizes sustainability. Government stakeholders at all levels, and shipping customers across industries, are setting ambitious goals and high expectations for environmental performance, and that includes the transportation of U.S. and global commerce on the waterways.

For the tugboat, towboat and barge industry, which moves nearly 700 million tons of cargo on America's rivers, coastal waters and Great Lakes annually, it's both an exciting and challenging time. How does an industry as geographically and operationally diverse as ours, made up of companies ranging from large, publicly traded corporations to family-owned multi-generation small businesses, navigate this profoundly disruptive sustainability landscape in a way that's good for the environment and for the bottom line?

It was this question that led AWO's Board of Directors to establish the CEO-level Sustainability Task Force, a group of leaders from across our industry focused on developing a strategy to address the various dimensions of this challenge. The Task Force's recommendations, approved by AWO's Board earlier this year, aim to ensure that the tugboat, towboat and barge industry has a prominent seat at the table in the ongoing national and global sustainability conversation, and that we are well positioned to advance positive outcomes and defend against proposals that would limit or disadvantage the industry.

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As an industry, we have an extremely positive sustainability story to tell policymakers, industry customers and the public today: the story of a single dry cargo barge that can move as much cargo as 16 rail cars or 70 trucks; of vessels that emit over 40% less carbon than rail and over 800% less than trucks; of our industry's substantial investment in repowering vessels to improve engine performance, which has slashed emissions by more than 15% since 2005; of our central role in the development of U.S. offshore wind energy; and of an industry embracing innovation by employing new technologies to reduce fuel consumption, improve vessel performance, and run on alternative fuels.

We need to tell this positive story far and wide, because our existing advantages over other modes, demonstrated commitment to continuous improvement, and unique position of having greater capacity for expansion than truck or rail, mean that waterways transport represents low-hanging fruit for shippers seeking to reduce their own environmental footprint. Public policies that support and encourage greater use of the most efficient and sustainable mode of freight transport would enable the U.S. to reduce transportation emissions overall, as the Biden Administration's interagency blueprint for transportation decarbonization has recognized.

We also need public policy – and investment – to maximize the efficiency, capacity and resiliency of the marine transportation system. That includes investing in mod-

ernized locks and dams and ensuring that the U.S. Army Corps of Engineers and Coast Guard have access to the dredgers, buoy tenders and other assets needed to keep navigation running safely and smoothly. It means exploiting the potential of digitization and data to optimize efficiency, reduce idling, and lower emissions.

And while it's critical to pursue policies that help vessel operators lead on sustainability by encouraging a shift toward waterways and maximizing efficiency, it's equally important to make sure policymakers do no harm to an industry so vital to a more sustainable future. That means eschewing policies that create inconsistent or duplicative regulatory patchworks, or impose infeasible requirements like we have regrettably seen with the California Air Resources Board's insistence on unsafe technologies and unworkable timelines.

Ours is a diverse industry of hundreds of companies and thousands of vessels, each with its own set of business drivers, operational needs and human and financial resources. We need public policies that support all vessel owners in taking the next steps on their sustainability journey – from removing bureaucratic impediments to technological innovation by early adopters, to helping companies that will never have a business case for an electric tug take meaningful steps toward reducing emissions from existing vessels. The collective impact of helping every vessel owner do better than they are today – rather than trying (impossibly) to make everyone do the same thing – will be transformative. Alongside our advocacy for enlightened public policy, AWO is committed to supporting members in their individual efforts to reduce their environmental impact by developing best practices; facilitating information-sharing; and increasing access to funding opportunities and other resources to support the adoption of sustainable technologies.

The tugboat, towboat and barge industry is a critical economic driver and indispensable security asset for the United States. By leveraging our collective strength and ingenuity to tell our story, advance supportive public policy, and empower companies across our industry in pursuing continuous environmental improvement, we will further establish ourselves as a proactive sustainability leader and partner for years to come.

Column

Nuclear

Will the Effort to Reach Zero Emissions Go Nuclear?

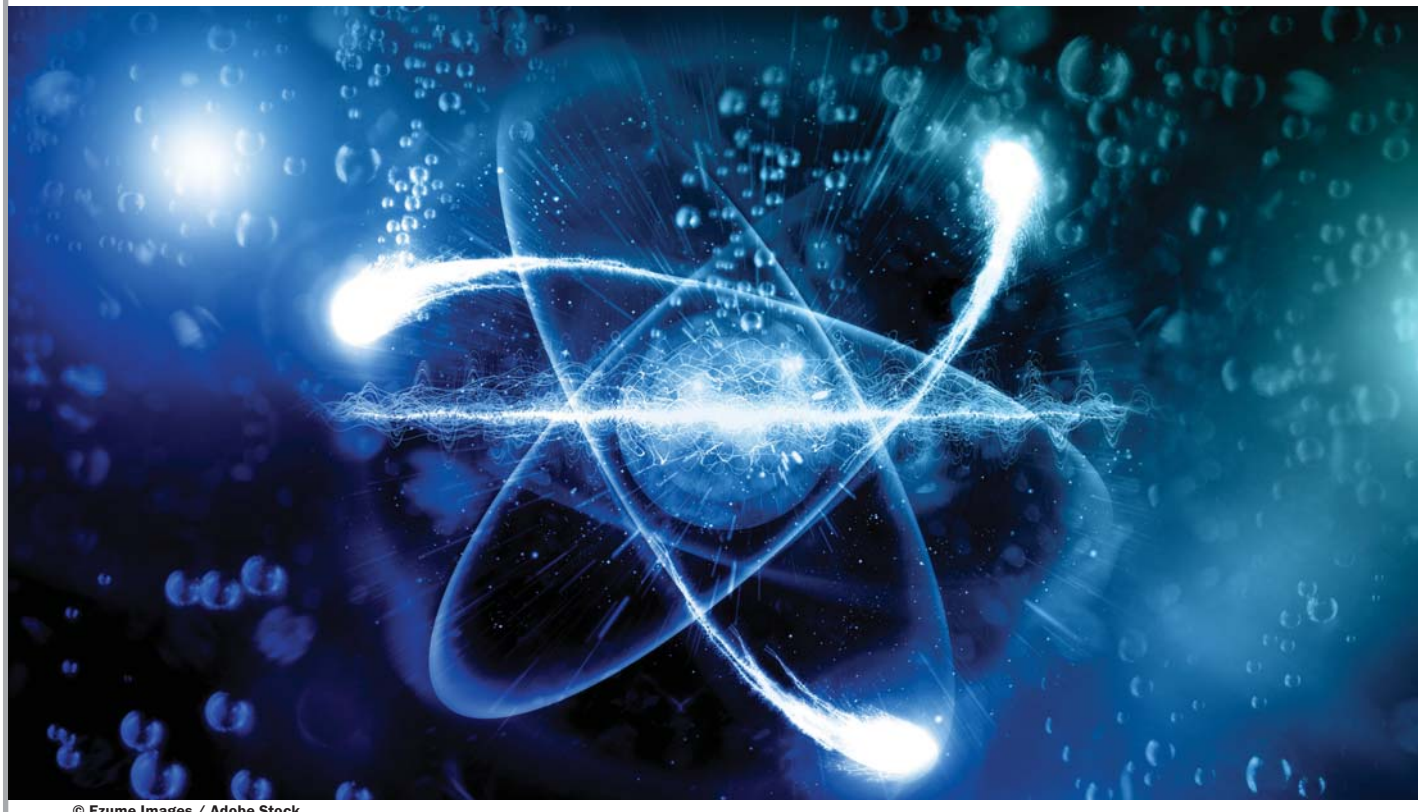
By Bob Kunkel, President, Alternative Marine Technologies

On December 8, 1953

President Dwight D. Eisenhower addressed the 470th Plenary Meeting of the United Nations General Assembly. The speech he delivered is often recognized as his effort to introduce "Atoms for Peace", a program to move nuclear fission and technology away from weapons development and into clean energy.

As a result of that effort and program, the NS Savannah was built and delivered as the first nuclear-powered merchant ship. She was built in the late 1950s at a cost of $46.9 million and launched on July 21, 1959. Despite rumors and industry scuttlebutt, the vessel actually traded and carried cargo and was deemed to have completed its mission as a technical success.

The Savannah has been moored in a Baltimore port since 2008. Last fall, its nuclear reactor was removed as part of its decommissioning. As we continue discussing the use of nuclear energy, keep in mind that the Savannah



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remains a recognized floating nuclear facility by the NRC. The decommissioning continues in capable hands with members of the U.S. Maritime Administration who have been associated with the vessel for many years.

The Savannah was not the only global merchant vessel that looked to employ nuclear propulsion. The Russian built LASH carrier Sevmorput continues to operate under government control to this day.

Move forward to current day requirements and regulations addressing alternative energy to power the national grid and the maritime industry's efforts to reach zero emissions, there is an indication that advanced nuclear technologies may be the path to achieve both goals and meet President Eisenhower's final statement in his Atoms for Peace speech:

> *"To hasten the day when fear of the atom will begin to disappear from the minds of the people and the governments of the East and West, there are certain steps that can be taken now".*

On September 28, 2023 we were invited to attend a Congressional Briefing on Advanced Nuclear Technology in the Maritime Industry in Washington DC. The meeting was well attended with congressional support, and the briefing was followed by an American Bureau of Shipping (ABS) Global Forum – The Role of Advanced Nuclear Technologies in the Maritime Energy Transition.

The ABS Forum gathered many maritime and energy sources to discuss the capability of new nuclear technologies. A well-orchestrated collection of shipowners, operators, port authorities, shipbuilders, designers, regulators and nuclear industry representatives were in attendance.

While many attendees may have been skeptical about where the forum discussions would lead, ABS Chairman and CEO Christopher J. Weirnicki's opening remark, "This is a generational moment," proved to be an understatement after listening to all of the panels. His quote could have well been included in Eisenhower's original address to the UN.

A driving force behind the ability to continue the research beyond the opening forum is the development of Small Module Reactors (SMR).

SMRs are a class smaller than conventional nuclear reactors, which can be built in one factory location, shipped, commissioned and operated at a separate site. The term

Column
Nuclear

SMR refers to the size, capacity and modular construction. It does not define the reactor type and the fission process applied. SMR types range from scaled down versions of exiting reactor designs to the latest Generation IV designs.

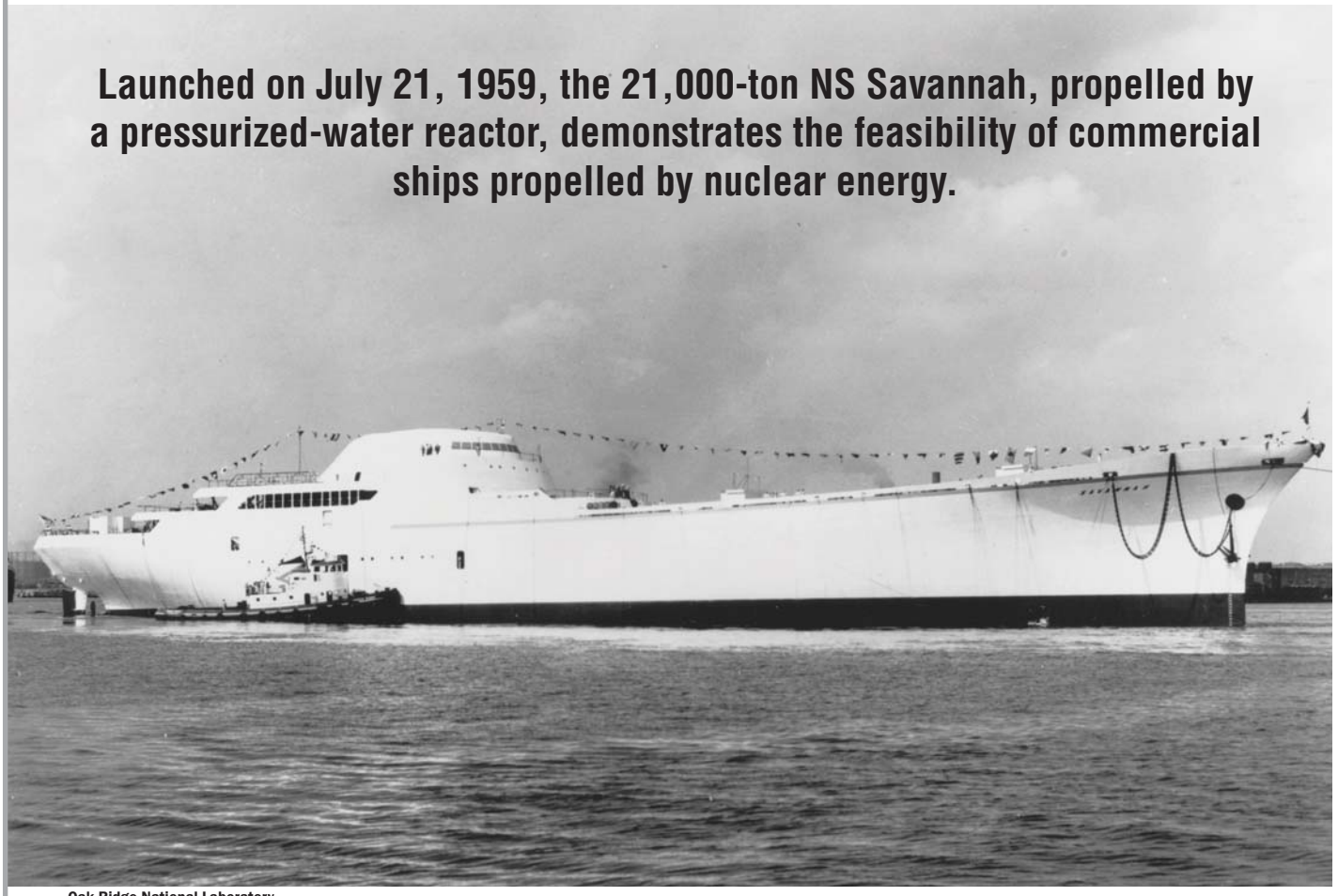
SMRs typically report an electrical output of less than 300 megawatts (MW) and/or less than 1,000 MWs of thermal energy. Many SMR proposals recommend stacking units to achieve the required energy output for each application.

To address the SMR for grid energy, the systems are developing to quickly replace coal fired power plants, diesel powered plants and natural gas. The modular design allows the energy source to be upgraded while retaining the remaining working platform of the power plant. The simple modular designs have fewer moving parts reducing failures that lead to current reactor accidents. SMRs use less radioactive material, significantly removing the risk of a nuclear disaster on the scale of Fukushima.

SMRs can be the solution to the U.S. energy problems as we worked toward mobility electrification. Offshore wind is facing huge economic issues and other headwinds on its path forward. Solar is experiencing similar problems. Both have actual efficiency issues when compared to current fossil fuel energy distribution. SMR nuclear energy does not have that problem; and with that said, getting that message across is easier said than done.

The global SMR market was reportedly valued at US$9.7 billion in 2021 and is projected to grow at a compound annual growth rate of 3.2% to reach US$11.3 bil-

Launched on July 21, 1959, the 21,000-ton NS Savannah, propelled by a pressurized-water reactor, demonstrates the feasibility of commercial ships propelled by nuclear energy.



Oak Ridge National Laboratory

lion by 2026. There are over 19 companies developing designs worldwide, and Russia & China report SMR systems in operation. The technology, no different than the Savannah, can be a technical success. The energy investment can lead to reduced costs for maritime applications. The issue moving forward will be defining the economics and moving past the perception of risk with regard to historical nuclear power: security, uranium fuel development, transportation and final storage of spent fuel material being paramount.

The economics goes beyond ship construction and propulsion costs. Imagine an industry that employs a fuel source that is good for 15 to 25 years. No need for the costs of developing the infrastructure to bunker ammonia, hydrogen or the proposed list of alternative fuels offered to meet IMO emission goals.

Building a financial model to address not only the capital costs required for new ship design, the SMR modular application, insurance, crew training and welfare, and the ability for the market and vessel type to save lost time for bunkering and repairs is, in our opinion, the next step to determine if the concept is viable. The propulsion application can actually allow us to reach zero emissions and successful sustainability within the IMO 2050 goal, while most of the current alternatives are merely temporary solutions. And with that, our financial and technical network intends to work closely with industry sources to analyze the economics and move this concept forward.

Crowley

Crowley's new electric tug eWolf is being built by Master Boat Builders for scheduled delivery in 2024.

WORKBOAT POWER

New Alternatives Join Diesel to Power Current—and Future—Vessels

By Barry Parker

Analysts and commentators are quick to point out that fossil fuels will power maritime equipment, and indeed dominate the fueling marketplace, well into the future. However, they will do so alongside new fuels, and new technologies, that will be introduced to the maritime sector in the coming years. In its September, 2023 report "Beyond the Horizon: View of the Emerging Energy Value Chains", the American Bureau of Shipping (ABS) explains that, "During the recent 80th meeting of the Marine Environment Protection Committee (MEPC 80), International Maritime Organization (IMO) members agreed on the revision of the Initial Strategy and approved the 2023 Strategy which prescribes more enhanced targets to tackle harmful emissions with the continued goal to reach net-zero GHG emissions by (or around) 2050." While many initiatives are underway, there is no definitive decarbonization path.

The U.S. Environmental Protection Administration (EPA), which participates in the United States delegation to the IMO, notes, "The international standards apply to both U.S. vessels and to foreign vessels Engines installed on U.S. vessels are also subject to fuel standards and engine emission standards that EPA has adopted under the Clean Air Act."

"Fuels and Propulsion Systems", a 2022 report by the Blue Sky Maritime Coalition (BSMC, promoting decarbonization for fleets serving North America—many of which are

not subject to specific IMO decarbonization measures such as the Carbon Intensity Index, or CII), stressed that "due to significant inherent differences in vessel categories and their operating conditions, there is no 'one-size-fits-all' approach to future low- and zero-carbon marine fuels." At the SHIPPINGInsight 2023 Conference, held in mid-October, Jennifer States, the VP and chief strategy officer of the BSMC, pointed to efforts in aviation, where carriers and government set a goal of creating one fuel for the industry. States, with a background that includes work at Class society DNV, noted that "The industry is working with government to help direct the research, development and deployment that's needed for sustainable aviation fuel [in an effort dubbed 'Grand Challenge']…I would say we need a sustainable maritime fuel."

EPA Tier 4

In the absence of a grand plan, the course will continue to be charted by rules and regulations. The movement to EPA Tier 4 engines had been slowed as manufacturers struggled to produce engines meeting EPA rules, promulgating further reductions of NOx and particulate emissions. Tier 4 plant technology is typically accomplished using a selective catalytic reduction (SCR) after-treatment to pull out NOx, or, alternatively, exhaust gas recirculation (EGR).

Recent deliveries of Tier 4 vessels have included McAllister Towing's Jane McAllister, a Washburn & Doughty-built tractor tug powered by a pair of Caterpillar 3516E engines (using the SCR process) that will be handling ship assists in the Norfolk, Va. Crowley Maritime recently took delivery under long-term charters of a trio of Tier 4 tugs, which will be serving the West Coast. The boats use a design from Vancouver, B.C.'s Robert Allan Ltd., and were built at Diversified Marine in Portland, Ore. for Brusco Tug, which then delivered them to Crowley. Summer 2023 saw the delivery of Artemis to Crowley, which will use the vessel (powered by a pair of Caterpillar 3156Es, putting out 7,000 hp) for ship assist and escort work. Earlier, sister vessels Athena, Apollo and Hercules had been delivered to Crowley under similar arrangements, and the vessels ate operating under long term charters.

Suderman & Young Towing, based in Houston, has also taken delivery of several Z-Drive tugs operating in Texas ports. The Eva, Brizo and Aurora are based on the Rapport 2600 design from Robert Allan Ltd., and built by Master Boat Builders Inc. in Coden, Ala. The tugs also are powered by a pair of Cat 3512E's, each rated at 2,213 bhp, driving a Schottel SRP 430FP Z-drive unit. The same yard has two tugs under construction for Moran Towing; also with a Robert Allan design, set for 2025 delivery. Most recently, Gulf LNG Tugs (a tie-up of Bay-Houston, Suderman & Young, and Moran Towing, announced that it would be ordering a quartet of Robert Allan designed escort tugs with Z-Drives and Cat Tier 4 3516e propulsion- two each from Master Boat Builders and two from the Sterling yard, in Port Neches, Texas.

The public sector is also moving to Tier 4 boats. In Summer, 2023, the Tennessee Valley Authority (TVA, which moves powerplant components by barge) took delivery of Freedom, a towboat built at the Vessel Repair yard in Port Arthur and powered by a pair of Tier 4 certified Caterpillar 3512E engines.

Alternatives to traditional diesel

Hybrid propulsion, where multiple drivers provide the power to turn the propeller, are also playing a role. In 2022, Master Boat Builders had delivered two ship escort tugs with a Robert Allan Ltd. design, Spartan and Titan, to Seabulk Towing. The vessels, with Berg Z Drive azimuth thrusters, can operate on either Tier 4 certified engines (2 x Cat 3512E) or on diesel generators (also from Caterpillar). The Lake Charles and Port Arthur operations of Seabulk Towing, where the two vessels have been operating, will be sold to Bay Houston Towing, in a deal expected to close in late 2023.

Electrification will be playing a big role in decarbonization. Kirby Corporation, a leading participant in the U.S. maritime sector, discussing its efforts, has said that: "Testing out alternative fuels, finding operational efficiencies, and investing in new technologies are a few initiatives the company is exploring to accomplish its [sustainability] targets" with a focus on "a 40% reduction of carbon emissions per barrel of capacity by 2040". In late August, Kirby christened its Green Diamond, which it described as "… the nation's first plug-in hybrid electric inland towing vessel," with battery power capability.

Kirby's Green Diamond is on time charter to a Shell USA subsidiary, operating locally in the Houston area. Another Shell entity, Shell Energy Solutions, installed a plug-in charging station utilizing kit from Zinus- well known for providing shore power in the passenger sector, at Kirby's Old River Fleet Dock, in Channelview, where the towboat

Seabulk Towing

Seabulk's first ever electric-hybrid tugboat, Spartan, was built by Master Boat Builders and delivered in 2022.

is based. Kirby's role goes beyond vessel operating. The vessel was built in Channelview by San Jac Marine, LLC, a Kirby-owned shipyard; and Stewart & Stevenson, another Kirby company, was responsible for the design and installation of the power management, control and propulsion systems. The actual propulsion is provided by a pair of 575 kW Danfoss motors, powered by a Corvus Orca series battery array providing 1243 kWh of power, or, if needed, a set of onboard Caterpillar generators.

"According to Kirby's modeling, when operating on shore supplied power, the fuel use can be reduced by almost 80%, resulting in an estimated 88-95% reduction in emissions of nitrous oxides, carbon monoxide and hydrocarbons," Kirby said. "When in hybrid mode with the generators running, the boat is expected to have an estimated 27% reduction in emissions compared to a conventional towing vessel."

Electrification through battery power works best for vessels not deployed continuously, to enable sufficient time for charging. Another BSMC publication, prepared by Vanderbilt University's Climate Change Initiative, "Pathways to Net-Zero 2050 in the North American Marine Shipping Industry", explained that "Some vessels, such as harbor assist vessels, operate for very short durations and remain in close proximity to port infrastructure when they are not working. Thus, these vessels may be candidates for electrification because they are frequently waiting at port where they could charge between assisting ocean-vessels into port."

Crowley is building a fully electric tug, Sea Wolf, for work around San Diego harbor. The battery powered boat (6 Mwh overall, two Corvus Orca BOBs—the containerized version the Corvus Orca, for energy storage), will use an onboard electrical package from ABB. Delivery, from Master Boat Builders, is anticipated in early 2024.

For longer runs on inland rivers, fuel cells are gaining traction for electricity production. The BSMC/ Vanderbilt report noted, "Longer term (15+ years) we expect the emerging investments being made today in hydrogen fuel technology to substantially transform the marine fuel landscape…" For the near term, electricity generated from hydrogen fuel cells is being explored, using methanol and ammonia as "carriers" for the hydrogen. Vessel owner Maritime Partners has invested in e1 Marine, building an electricity powered boat (with methanol input to the fuel cell) to be operated on the inland waterways by American Commercial Barge Line (ACBL).

In a project that will demonstrate the feasibility of ammonia for providing electricity, Amogy, based along the Brooklyn, N.Y. waterfront, is now fitting out a retired

Blue Sky Maritime Coalition

"We need a sustainable maritime fuel."

– Jennifer States, VP and chief strategy officer, Blue Sky Maritime Coalition

tugboat for a demonstration project along the Hudson River. Amogy's ammonia powerpack—an ammonia fed fuel cell, mountable in a container or on a skid—has seen successful trials powering tractors and trucks. At the SHIPPINGInsight event, Amogy's manager of strategy and business development, Gancheng Sun, stressed in her remarks that ammonia is widely available and traded with a well-developed infrastructure. Fellow panelist Captain Don Carroll, from chemical tanker owner MT Maritime, sought to dispel issues related to safe handling of ammonia, saying, "We handle it all time; we are very familiar with it."

Nuclear power is also a potential future fuel for zero emission shipping. On the SHIPPINGInsight fuels panel, Meg Dowling, the nuclear programs lead at ABS, talked about ongoing efforts to evaluate feasibility of reactors for vessels. She suggested that "micro-

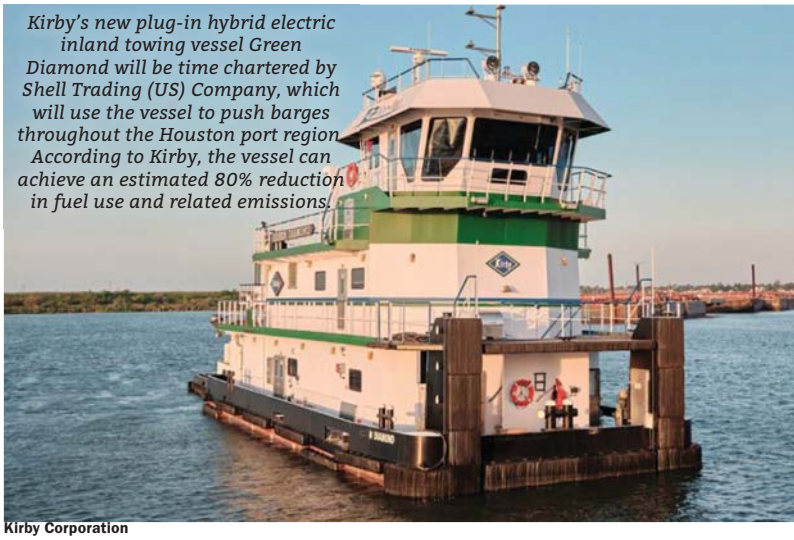
Rose Cay Maritime's tug Susan Rose is equipped with Tier 4 engines.

Rose Cay Maritime

reactors" putting out equivalent of up to 10 mWe electricity could be used on smaller vessels. A recent release from Crowley announced its cooperation with BWX Technologies—which provides reactors for U.S. military vessels and has recently been evaluating micro-reactors fitted in containers—on a conceptual design for a vessel with an onboard reactor to supply power to shoreside facilities. Core Power, a developer of Molten Salt Reactors (MSR) specifically for the maritime sectors, has been involved in successful testing alongside utility Southern Company, Terra Power, a business incubator tied to Bill Gates.

California's push for 'green'

Alex Parker, managing partner at Rose Cay Maritime, which currently operates a large tug and barge fleet, deployed primarily in the U.S. Gulf and along the East Coast, told ***Marine News***, "We now serve the U.S. West Coast and are consistently transiting the Panama Canal



Kirby's new plug-in hybrid electric inland towing vessel Green Diamond will be time chartered by Shell Trading (US) Company, which will use the vessel to push barges throughout the Houston port region. According to Kirby, the vessel can achieve an estimated 80% reduction in fuel use and related emissions.

Kirby Corporation

Artemis, built by Diversified Marine for Brusco Tug & Barge, is a tug with Tier 4 engines chartered by Crowley.

carrying renewable fuels. In our planning, we are monitoring the California Air Resources Board guidelines; as some of our vessels are equipped with Tier 4 engines, including the 4,000 HP Susan Rose built in 2019."

The California Air Resources Board (CARB) has implemented several regulations to reduce emissions from both oceangoing vessels and harbor craft, and they're not about fuels of the future; they're about the here and now. The regulations in California, which have begun to phase-in, may ultimately impose standards even tighter than the EPA's Tier 4.

Against the considerable hoopla surrounding new fuels, and demonstration projects, internal combustion engines are alive and well. In the international deepsea realm, methanol fueling for conventional engines has been gaining traction, notably with orders for large containerships by giants like Maersk and CMA CGM. Methanol may soon figure into larger vessels in the Jones Act landscape; Overseas Shipholding Group (OSG) recently announced the purchase of the laid-up tanker Alaskan Frontier, which will see extensive engine refurbishments including "[preparing] the engines for possible methanol fuel in the future."

Crowley Maritime

Accelerating US CTV Market Development with Hybrid Solutions

By Myra Shannon-Fuller, ABB

As the world looks to renewable energy sources to combat climate change and reduce reliance on fossil fuels, offshore wind has emerged as a promising frontier in the United States. A report by the University of California Berkeley released in August concluded that due to the nation's long coastlines with sustained winds in many areas and falling turbine costs, offshore wind could feasibly supply between 10% and 25% of the country's energy demand by 2050.

While that may paint a rosy picture of a cleaner, greener future, achieving that level of energy production hinges on overcoming a series of logistical and operational challenges, one of which is the efficient and sustainable transfer of personnel and equipment to and from offshore wind installations.

Crew transfer vessels (CTV) are considered a workhorse in the offshore wind industry, and one of the few ship types used throughout every phase of an offshore wind project. To support the expansion of U.S. offshore wind and to sustain it for the decades to come, a more robust U.S.-flagged fleet of CTVs is needed. Against the backdrop of the maritime industry on a mission to decarbonize, hybrid solutions can play a significant role in developing a U.S.-flagged CTV fleet that is fit for the future.

A fitting solution

Increasing commercial and regulatory pressures on shipping have shown a spotlight on the efficiency, flexibility, and reliability of hybrid and fully electric vessel designs. There is increased interest in electric solutions across the industry, including for CTVs, whose operating profile is well suited for the technology.

"Vessels operating on predictable routes are a good fit for electrification," said Ed Schwarz, vice president of sales marine systems at ABB Marine & Ports, noting that the exact operating profile of CTVs for U.S. offshore wind remains to be ironed out, but that CTVs will generally operate in near-coastal lease areas and on routine schedules. The uniqueness of these vessel's charter adds to the appeal for electrification. "The investment cost is still somewhat higher for electric propulsion versus diesel-mechanical, however, considering the daily operations of these vessels and the length of their charter, for CTVs the rate of return on that capital investment is much shorter."

The fuel cost generally falls on the energy company chartering the vessel, giving CTV owners vying for contracts a competitive advantage when implementing hybrid solutions that optimize fuel efficiency and reduce emissions. "That's how we look at it," said Jack Cammarota, director of marine operations at Blue Ocean Transfers. Blue Ocean Transfers (BOT) is a U.S. flag shipping company delivering Jones Act-compliant crew transport and transfer services to the U.S. offshore wind market and keeping a close eye on hybrid solutions for its fleet.

"There is currently a flurry of new construction happening along with existing vessels being retrofitted to enter the space and fill gaps in coverage," Cammarota said. He acknowledges that the limited availability of CTVs today leaves a runway open for modified assets, but that there will come a time when they won't pass muster anymore for a multitude of reasons. "We intend to bring a premier level of robust support and service to offshore wind, which leads us to take a longer view. It's not just about satisfying market demand between now and in 2030, but what technologies will make the most sense for a CTV in the market in 2030 and beyond."

The technology benefits

"There are several ways fuel efficiency improves with diesel-electric propulsion," Schwarz explained. "The ability of electrical motors to generate full torque at zero speed makes power available immediately for increased operational safety, and without the requirement to over-torque. Additionally, greater responsiveness due to variable frequency operations enhances maneuverability, and it offers greater overall fuel efficiency."

From an operational standpoint, at reduced propeller speeds, the number of supplying generators can be matched according to power demand, thereby reducing engine wear and tear, and lowering the maintenance cost for a diesel-electric system. If the vessel has only one engine type on board, there are additional operational savings to be had with the reduction in spare parts required.

"It isn't just lowering lifecycle cost or minimizing the standstill time required for maintenance and service," Schwarz noted. Configuration of a diesel-electric propulsion system offers better redundancy for more reliable operations. "Power can be distributed to either propulsion motor, minimizing the risk of single-point failure resulting in a total loss of propulsion. Undoubtedly, this enhances

ABB

"The investment cost is still somewhat higher for electric propulsion versus diesel-mechanical, however, considering the daily operations of these vessels and the length of their charter, for CTVs the rate of return on that capital investment is much shorter."

– Ed Schwarz, VP of Sales Marine Systems, ABB Marine & Ports

safety for the ship's crew and the personnel being transported. Meanwhile, it's also a more comfortable experience for those onboard due to lower noise levels and vibration."

Diesel-electric systems also provide greater flexibility in vessel design, as heavy equipment can be more evenly distributed throughout the vessel when configuring the propulsion system. The design of a hybrid CTV can be developed to allow for better utilization of the onboard space, enabling the vessel to better serve its operating duties. "This is key because weight is always an issue in the CTV world," Cammarota said. "To put more in you must take something away, reduce the carriage size, etc. That's the last thing you want when your goal is to create a workboat solution that's ready for any challenge it faces."

Hybrid propulsion provides a host of opportunities and benefits for new construction when looking into the future as well, Schwarz explained: "The increased connectivity of diesel-electric systems allows for new and future sources of energy to be introduced to optimize efficiency." This connectivity also improves efficiency by providing access to critical equipment and operational information, which enables ABB to support operators with guidance on predictive engine maintenance, insight into vessel performance, and even the ability to perform remote diagnostics.

Growth in shore power

Of course, shore charging infrastructure is essential to the viability of hybrid propulsion for CTVs, but according to

Blue Ocean Transfers is keeping a close eye on hybrid solutions for its fleet.

Blue Ocean Transfers

Schwarz, there is a promising outlook there. "Worldwide there is a growing imperative to reduce emissions," he explained. "Across the United States, we see more attention, action and investment to develop shore-based power installations as part of the overall effort of port decarbonization, which involves transitioning to cleaner energy sources and improving operational practices to reduce emissions."

Shore connection for vessels is a key innovation that will improve port operational practices. While in port, a vessel traditionally would draw from its diesel auxiliary engine power to generate electric power to maintain onboard essential functions, including lights, air-conditioning, etc. Shore power charging allows a vessel to instead, plug in and access electrical power from shore while docked, thereby enabling for the ship's auxiliary engines to be shut down. With access to connect to shore power in port, vessel emissions can be reduced significantly.

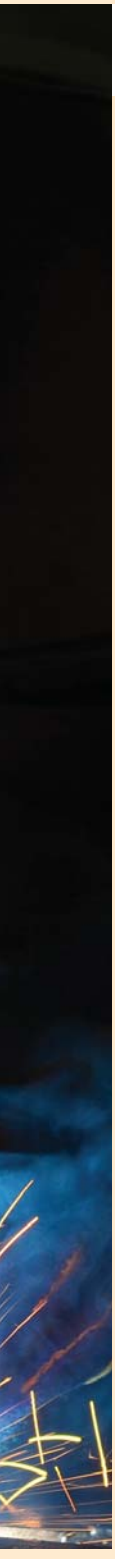
Notably, a significant percentage of U.S. offshore wind lease areas are near major population centers, which are also home to port communities that have been plagued by air and noise pollution that is largely attributed to vessels using heavy fuel oil in ports. The connection of offshore wind energy to the grid can have a major and positive impact on the ports' energy system. "Having a sustainable energy model behind electrification enables true decarbonization," Schwarz said.

Going the distance

What's been said about collaboration being key to achieving maritime decarbonization can be applied similarly to achieving the growth targets for U.S. offshore wind. While it may be a long shot, reaching the goal of 30 gigawatts (GW) of U.S. offshore wind by 2030 is only attainable through increased stakeholder engagement and the strengthening of cross-sector collaboration.

"A lot of things are siloed in the space right now, and I think that's hindering market development and, ultimately, industry growth," Cammarota noted. "More cooperation and engagement from stakeholders—both public and private—and more transparency across the board would help to mitigate delays and get things off the ground a little bit better. This industry is full of amazingly talented individuals, it's only a matter of bringing folks to the table to flush out the solutions we need to reach our goals."

SHIPBUILDING: POLICY AND PROGRESS



By Tom Ewing

When asked about the top issues facing shipbuilders, executives at the Shipbuilders Council of America (SCA) listed a number of topics and concerns. SCA is the only national trade association representing U.S. shipyards engaged in the building and repairing of military and other government and commercial vessels, and companies providing goods and services to the shipbuilding industry.

Shutdowns have consequences

Matthew Paxton and Paula Zorensky are, respectively, SCA President and Vice President. Their top federal concern at the end of September? A U.S. government shutdown.

Paxton and Zorensky said that even a brief shutdown would impact budgets, safety, agency oversight and, of course, construction schedules. And the longer it lasted, the worse it gets. "We want to get into the next fiscal year," Paxton commented, "to retain the strong momentum that underlies vessel construction programs."

Fortunately, events moved in the right direction when, at the last minute on September 30, Congress passed HB 5860, a continuing resolution (CR) to extend current FY23 funding. But this just kicked the can down the road since the CR only provides funding through November 17, when hopefully a final budget bill will be approved. If not, it's déjà vu all over again.

(The federal fiscal year runs from October 1 to September 30. Last minute budget dramas can make it easy to forget that the process starts on the first Monday in February. By November 17 it will be just a little over two months before Congress starts work on FY25 spending.)

The Jones Act and clarity

For SCA members, Jones Act rulings form another set of top issues. Clear policies are critical, particularly decisions from Customs and Border Protection (CBP). Offshore wind projects will require hundreds of new American built vessels but multimillion dollar investments won't happen if operating policies are murky.

As an example, Paxton and Zorensky cited a CBP ruling linked to the installation of wind tower monopiles (steel tubes driven into the seabed, forming a foundation for additional construction). In July, CBP was asked whether it was a Jones Act violation if a non-coastwise-qualified installation vessel worked, unanchored, to install monopiles at a pristine seabed site in U.S. waters.

In August, CBP replied: No - "The transportation of monopile foundations from a U.S. coastwise point to a pristine seabed site on the OCS by a non-coastwise-qualified vessel would not violate the Jones Act."

That was challenged, not just by SCA but by a broader coalition, the American Maritime Partnership (AMP). Consequently, in September, in a letter to Jennifer Carpenter, President & CEO of the American Waterways Operators (AWO) and a member of AMP's Board of Directors, CBP wrote that, upon review, it "modified" its ruling. AMP had raised an issue that wasn't addressed by CBP, i.e., whether it was a Jones Act violation if (1) a vessel anchored itself to the pristine seabed because of severe, inclement weather and (2) the anchored vessel engaged in work at that point.

CBP's September letter revised its earlier conclusion (or "holding," to use CBP's parlance). In the AMP letter CBP writes:

> *"Anchoring of the installation vessel to the seabed to aid its installation activity, even if due to inclement weather, would result in a violation of the Jones Act. Here, the installation vessel would be attached to the OCS via the anchor for the purposes of exploring for, developing, or producing resources, including non-mineral energy resources. Therefore, such anchoring would establish the installation vessel as a coastwise point while the attachment exists and result in a violation of the Jones Act once the monopiles are unladen at the vessel."*

CBP writes that "upon review, we have modified HQ H328718 (the document reference number) in part to clarify its holdings." That's a change just within two months, a policy vacillation with real impacts on markets

SCA

Matthew Paxton, President, Shipbuilders Council of America

SCA

Paula Zorensky, VP, Shipbuilders Council of America

and investments.

"We don't need everything to be in the weeds," Zorensky commented, "but consistent and predictable rulings are important for finance and for American shipbuilders."

Domestic/foreign parity in employment

Another top concern, and one still at play in Congress, is legislation impacting U.S. workers on new offshore energy projects. This effort was initiated by Sen. Bill Cassidy (R-La.) in February 2022 when he introduced the "American Offshore Worker Fairness Act (AOWFA)." Cassidy said the bill "provides a level playing field between U.S. flagged vessels and foreign-flagged vessels working in offshore energy activities in U.S. waters."

More than 100 maritime companies and organizations, including SCA's Matthew Paxton, signed a letter endorsing AOWFA. The letter provides insights into US business' concerns. It notes that all vessels, rigs, platforms, or other structures on the U.S. Outer Continental Shelf (OCS) are to be staffed by U.S. citizens or lawful permanent residents. However, there is an exemption for foreign owned vessels in order to be fair when American mariners are hired for foreign offshore projects.

But this fair play allowance needs review, the maritime organizations wrote to Sen. Cassidy. They explain:

"In practice, the exemption has not provided reciprocal access to foreign waters for U.S. mariners or companies but has allowed foreign vessels owned by foreign companies headquartered in some of the wealthiest countries to utilize mariners from low-wage nations. When employed in our waters, these mariners are not paid U.S. wages, but wages reflecting the rates paid in the international market."

Cassidy's bill is now part of HR 2741, the Coast Guard Authorization Act of 2023. In a background document SCA writes that AOWFA "is likely to result in more domestic shipbuilding for the U.S. offshore wind market." By closing domestic-foreign employment loopholes, SCA writes that "companies who wish to operate in the American offshore wind market will be compelled to make investments in U.S.-built vessels."

'Vessel Construction Manager (VCM)'

When asked about new industry trends and developments Paxton and Zorensky quickly referenced delivery, in September, of Philly Shipyard's Empire State, the new purpose-built training vessel for the SUNY Maritime College, the first of a number of such vessels to be built U.S.'s state maritime academies over the next few years.

Paxton and Zorensky's reference wasn't just to the ship, although the vessel itself and its dual capabilities for training and humanitarian missions surely deserves attention. Rather, their comments focused on a new business model. More specifically, a Vessel Construction Manager (VCM) contract model, a programmatic requirement set by Congress in the 2017 National Defense Authorization Act, directing MARAD to "provide for an entity other than the Maritime Administration to contract for the construction of the NSMV" (i.e., the National Security Multi-Mission Vessel, a broader descriptor for the new training ships.

The Empire State is the first vessel built within the VCM framework. Paxton and Zorensky commented emphatically: A success. Do it again. It was the VCM model that kept the NSMV on schedule and within budget, obviously significant attributes for shipbuilders, their customers and, in this case, U.S. taxpayers.

Readers may recognize a number of events aligning here. After Congress set the VCM demand MARAD announced in 2019 that it selected Tote Services, Inc., of Jacksonville, Fla., as NSMV Vessel Construction Manager. Tote's charge was to oversee and manage detailed design, construction, testing and delivery.

Significantly TOTE Services was also tasked with issuing a request-for-proposals to shipyards. In April 2020, TOTE Services awarded Philly Shipyard a contract to construct up to five NSMVs. Keel laying for the Empire State was in May 2021.

Ben Christian is TOTE Services' VP for Business Development and New Construction. John Bond is Project Director and NSMV Program Manager for Philly Shipyard, Inc. The two were asked for their insights and advisories about the VCM process and the Empire State project.

The Empire State required a new kind of commitment from the contract manager, the shipyard and MARAD, Christian said. "It took some time to get this right," he add-

TOTE

"It took some time to get [the VCM process] right," he added, "but the demand for success was important. All parties stayed in their lanes. This was make or break for industry."

– Ben Christian, VP for Business Development and New Construction, TOTE Services

ed, "but the demand for success was important. All parties stayed in their lanes. This was make or break for industry."

Both men commented that MARAD was not a distant partner, it stayed engaged. "They were good at making sure we were doing what we said," Bond said. But once a decision was made, it was respected by all. They noted that MARAD's project team was smaller than for past, similar government projects. Real world impact: fewer bosses for TOTE Services and Philly Shipyard.

Bond commented that the VCM model "helped us build vessels. That's what we do best." The VCM established an arms-length status among the parties, avoiding multiple layers of reviews, reporting and related bureaucracy.

As an example, Bond referenced the need to get design work done quickly. "We didn't want to redo any work," he commented. VCM allowed a faster process, one similar to private sector, commercial pacing, not traditional government timetables. "We wanted to minimize change," Christian said, "and we spent the time up front getting the design right."

Another example: the VCM avoided double sea trials – one undertaken by the shipyard and then another ordered by the government, a duplication with significant cost impacts, a duplication that could have happened "out of habit," Christian commented. He called the Empire State's integrated sea trial "groundbreaking."

Christian and Bond both hope that NSMV's success will lead to more VCM style contracts, and more ships being built to address U.S. maritime needs.

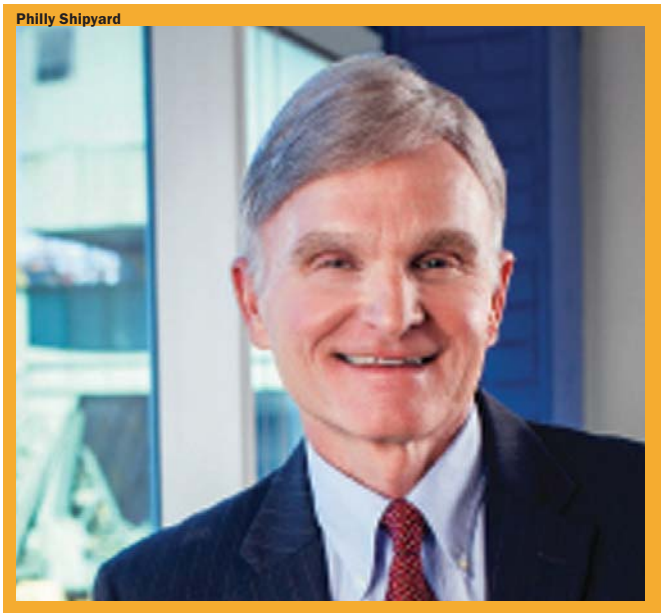
MARAD's Viewpoint

Laila Linares is MARAD's NSMV Senior Program Manager. She was asked about the VCM model and the important milestone with the delivery of the Empire State. In response to emailed questions, she provided extensive insights into the VCM model as well as her thoughts on lessons applicable to future projects.

Linares said that the VCM model saved the government hundreds of millions of dollars and several years in construction time. One critical reason was MARAD's extensive upfront work on vessel design, a focus that allowed TOTE Services and Philly Shipyard to quickly move to production.

She explained that MARAD used a "firm, fixed-price" contract, typical, she said, for commercial markets, one that reduced risk of cost overruns and delays. Another move was development of a single shipyard Indefinite Delivery/Indefinite Quantity (IDIQ) award, an approach that further protected the Government's contractual interests. MARAD wants five training vessels, but it doesn't have full funding available right now. The IDIQ capitalized on economies of scale not available with multiple shipyards.

Philly Shipyard



"[The VCM model] helped us build vessels. That's what we do best."

– John Bond, Project Director and NSMV Program Manager, Philly Shipyard, Inc.

"The IDIQ approach," Linares explained, "provided the right flexibility to support the initial funding/construction of the first two vessels and then later for the remaining vessels to complete the NSMV State-Class. By working with a single shipyard as opposed to multiple shipyards, we have been able to achieve greater efficiency and cost savings through configuration control, with vessels of an identical design and equipment."

Linares called the NSMV program "a new chapter in federal shipbuilding, a historic new commitment to maritime education, shipbuilding best practices, and the U.S. maritime industry." She said the government benefited from the ability to leverage commercial entities' acquisition processes to maximize competition and experience.

MARAD

"Through the VCM model, we've learned a lot about U.S. shipbuilding capabilities and gaps."
– Laila Linares, NSMV Senior Program Manager, MARAD

The VCM model, she added "created a highly competitive and streamlined approach that can be used in the future by other government entities to procure ships."

Indeed, Linares said the government has a unique opportunity to review and ask, "What worked well, what didn't work so well and what are some ways that the VCM model can be strengthened even further?"

She said there is already a shift in the federal shipbuilding sector because of this initial VCM success. She called this "a bold step" that minimized risk because of a solid design and sticking to that design – "meaning," she said, "don't change design requirements during construction" – and setting delivery and budget expectations. She added, "I think that there will be parts of government shipbuilding that will struggle with 'letting go' a little, but we stand ready to share our experiences."

Linares said that MARAD has received inquiries from other federal and state agencies about the VCM acquisition model. "This is a great time for us to share best practices," she commented. More specifically, she noted that

Empire State is the first of five new ships being built by Philly Shipyard under MARAD's NSMV program. The vessels will be used to train cadets at the country's state maritime academies.

MARAD

"Congress is interested in seeing us do it again" and she referenced building out the Ready Reserve Force or RRF vessels. This funding still needs to be cleared by the Office of Management and Budget, but when those projects are ready to move it's likely they will advance within the VMC framework.

Linares was asked about lessons that might transfer to or otherwise impact private sector shipyards.

The VCM concept, she said, is "really nothing more than a commercial approach to shipbuilding that utilizes private sector shipyards to build as designed on schedule and at a fixed price." This was championed by the maritime industry, she explained further, as the best model because "it improves the U.S. maritime industrial base, from steel to suppliers, ship managers to ship builders, and creates new jobs for the American workforce. Through the VCM model, we've learned a lot about U.S. shipbuilding capabilities and gaps."

In closing, Linares said MARAD will work with the Department of Transportation and Congress to strengthen U.S. shipbuilding and related manufacturing. Additionally, she said that MARAD is looking at ways to increase U.S. ship repair capabilities and skilled labor through grant programs and helping vocational and technical training institutions. She's hopeful that future MARAD shipbuilding projects like the NSMV will expand to additional shipyards.

"Nothing will support this critical industry more," she wrote in a final comment, "than a steady, predictable, long-term demand for commercial shipbuilding and repair capabilities."

Feature

Great Vessels of 2023

Length: 525 ft.
Breadth: 88.5 ft.
Depth: 55.1 ft.
Draft, design: 21.4 ft.
Range: 10,000+ miles @ 18 knots
Propulsion: Diesel Electric
Engines: Wabtec (4) separated in two engine rooms
Total installed power: 16,800 kW
Emergency generator: 900kW
Electric propulsion motors: 2 sets in series with an output of 9,000 kW
Full speed: 18 knots with 15% sea margin
Cruising speed: 12 knots with 15% sea margin
Bow thruster: 1800 kW, retractable
Stern thruster: 890 kW
Rudder: Flat type

MARAD

EMPIRE STATE

As the lead vessel in a series of five new training ships being constructed to serve America's state maritime academies, Empire State is easily one of the most important U.S.-built vessels delivered in recent memory.

Built by Philly Shipyard for the U.S. Department of Transportation's Maritime Administration (MARAD) under its National Security Multi-Mission Vessel (NSMV) program, Empire State arrived to the Bronx, N.Y. in September in preparation to help train the next generation of U.S. mariners attending SUNY Maritime College.

In 2015, MARAD engaged with the U.S. Department of Transportation's Volpe Center to make the business case for the recapitalization of the state maritime academy training fleet. The results of the study indicated that if the government failed to take action by 2025, three of the existing training vessels would be inoperable, spelling "long-term negative impact on national security, reducing the number of credentialed mariners available to operate U.S. vessels during war, national emergencies, and for domestic and international commerce."

That same year, MARAD began work with Herbert Engineering to develop a design for what would eventually become the NSMV. The demands on the design would be significant. In addition to have to physically fit in the berths available at the state maritime academies, and serve as a state-of-the-art training platform for up to 600 cadets at sea, the vessel design would also have to accommodate use as a humanitarian aid and disaster relief (HA/DR) platform. State maritime academy vessels being used to support HA/DR missions was, of course, not a new concept. For example, in 2012, the Kennedy from the Massachusetts Maritime Academy and the previous Empire State from SUNY Maritime College were used to house disaster relief workers during the Hurricane Sandy clean-up effort. The difference, of course, is that the NSMV was designed to specifically support HA/DR operations, incorporating a roll-on/roll-off side ramp, container space, onboard cargo handling equipment, a helipad and berthing for up to a 1,000 people.

The result was a mature design, which together with the business case from Volpe, allowed MARAD to receive Congressional funding to begin the NSMV program in earnest. However, Congress saw the value of partnering with private industry to efficiently construct these next generation dual-purpose vessels. Accordingly, the National Defense Authorization Act for Fiscal Year 2017, required "an entity other than the Maritime Administration to contract for the construction of" the NSMVs. The stated Congressional goal was to "leverage the ship construction expertise of… a commercial operator when contracting for

the construction of the vessel."

This Congressional direction led to a MARAD Vessel Construction Manager (VCM) contract award to TOTE Services in 2019, leveraging their deep experience in commercial vessel construction. In turn, TOTE Services awarded the initial vessel construction contract in April 2020 to Philly Shipyard to build the first two vessels. The next two vessels in the NSMV program were ordered in 2021, followed by the fifth and final vessel in 2022.

The government sponsored shipbuilding program is the U.S.' first to utilize the VCM model, which places the responsibility for the selection and oversight of the shipyard on a government contractor that utilizes commercial best practices to manage the project. By all accounts, the program has been heralded as a success.

The new Empire State represents a radical technological upgrade for SUNY Maritime, as it replaces a ship that is more than 60 years old.

Starting in the machinery space, Empire State has a modern diesel-electric power plant, built with redundancy in that there are two separate engine rooms with a pair of diesel generators in each, both feeding dual high voltage switchboards and dual propulsion motors.

Power onboard consists of Wabtec Corporation's 16V250MDC, EPA Tier 4, IMO Tier III marine diesel engines designed to provide the power generation for the ships' electric grid, including the power and propulsion system which is supplied and integrated by GE Power Conversion. For the NSMV series, Wabtec will deliver a total of 20 x 16V250MDC Wabtec EPA T4 marine diesel engines plus accessories to its channel partner, Cummins Sales & Service, who has the job of packaging the engines into marine gensets for the five vessels.

The NSMV series and all of its modern technology will help to prepare the coming generation for real world sailing and the tech they will enter on working vessels.

The second vessel of the NSMV series, Patriot State, is destined for the Massachusetts Maritime Academy and scheduled for delivery in 2024. Philly Shipyard recently laid the keel for State of Maine (Maine Maritime Academy) and cut first steel for Lone Star State (Texas A&M Maritime Academy), and the yard is slated to begin construction for the fifth NSMV (California Maritime Academy) later this year for delivery in 2026.

Feature

Great Vessels of 2023

Corvus Energy

The United States' first plug-in hybrid electric inland towing vessel, christened at a ceremony in Houston in August, arrives as the commercial marine industry continues to implement new technologies to reduce its environmental footprint.

Kirby Inland Marine's Green Diamond will be time chartered by Shell Trading (US) Company, which will use the vessel to push barges throughout the Houston port region. According to Kirby, the vessel can achieve an estimated 80% reduction in fuel use and related emissions.

"We are excited to be the first to market with a plug-in hybrid inland towing vessel," said Christian O'Neil, president of Kirby Inland Marine, a subsidiary of Houston-based Kirby Corporation. "Barge transportation is already the cleanest and greenest way to move a wide variety of cargoes in America, and we are working to make it cleaner and greener. Our customers who are focused on reducing their emissions want more efficient options. This solution is available today."

Green Diamond's hybrid electric propulsion system leverages the advantages of proven diesel-electric plants with the enhancement of new battery technology, O'Neil told Marine News. "Each inland towing vessel voyage is different, with stops at various ports and terminals, such that the vessel cannot depend upon returning to a known dock within a given timeframe. This rules out battery-only inland vessels for most trades, but the hybrid electric concept fits perfectly."

"Hybrid electric plants have the added benefits of quieter operations enhancing crew comfort as well as enjoying the operational benefits of electric motors with their broad torque curves and responsiveness to throttle inputs," O'Neil added.

Kirby leveraged in-house expertise to design and build the new vessel. Green Diamond was constructed by San Jac Marine, Kirby's shipyard in Channelview, Texas. Another Kirby company Stewart & Stevenson Manufacturing Technologies designed and installed the power management, control and propulsion systems.

Chad Joost, executive vice president at Stewart & Stevenson, said the firm brought to the project power management expertise and a track record working with high horsepower electric systems in the oilfield. "We were able to adapt that patented technology to the marine environment and enable this vessel to operate on shore power and charge the batteries while on dock, then get underway on battery power. On extended trips, the generators will be used to supply power to the motors and charge the bat-

teries. All of this happens seamlessly through Stewart and Stevenson's power management system."

Propulsion is provided by two 575 KW Danfoss electric motors that can be driven either by the Corvus Orca E2250V energy storage system, which provides 1,243 KWH of power, or, if needed, onboard Caterpillar C18 generators.

Norway-based Corvus Energy earlier this year opened a new factory Bellingham, Wash. in response to a "significant uptake in opportunities for maritime batteries from the U.S. market".

"Inland towboats and tugs are ideal candidates for electrification with batteries because their routes are often shorter and closer to shore [where access to charging is available]," said Erik Larsen, Corvus Energy VP sales, Americas. "Recent electric vessel projects in the North American market include HaiSea Marine's new battery powered escort and harbor tugs for a liquefied natural gas (LNG) export facility in Kitimat, and the Crowley eWolf tug currently under construction at Master Boat Builders."

While designing and building a first-of-its-kind vessel such as Green Diamond can be difficult, a limited regulatory guidance for Sub-Chapter M hybrid-electric vessels and how to work that guidance into the design of a vessel presented its own set of challenges, O'Neil said. "Supplier partnership and collaboration was critical was early and proactive engagement with the U.S. Coast Guard and ABS. Given the breadth of 'new territory,' all stakeholders in this project took a significantly more involved approach than is typically required with established, conventional vessel types."

A Shell-owned Zinus charging system will be used for dockside charging of the battery system, allowing the vessel to complete trips within the Houston area without using its generators, Kirby said. Shell Energy Solutions will provide electrical power matched 100% by Green-e certified renewable energy certificates to charge the vessel's battery system.

"This really puts the 'green' in Green Diamond," O'Neil said. "Operationally, the vessel can and will operate in any and all areas and types of service as a conventional inland towing vessel. It is not restricted if shore charging infrastructure is not available. Even without shore-charging, it will see a greater level of fuel efficiency and emissions reductions than a conventional vessel."

According to Kirby's modeling, when operating on shore supplied power, the fuel use can be reduced by almost 80%, resulting in an estimated 88-95% reduction in emissions of nitrous oxides, carbon monoxide and hydrocarbons. Engine run time can be reduced between 93 and 98% compared to a conventional inland towing vessel, Kirby said. When in hybrid mode with the generators running, the towboat is expected to have an estimated 27% reduction in emissions compared to a conventional towing vessel, the company added.

Maarten Poort, Shell's general manager for shipping and maritime in the Americas, said, "The Green Diamond demonstrates how industry can collaborate to make strides towards profitable decarbonization in the shipping sector. It's concrete action in the right direction—with recognition by those involved that leveraging innovation for lower-carbon outcomes is critically important for our industry, for our companies, for our communities."

"The plug-in hybrid design offers numerous advantages for towboats in certain trades," said Mitch Jones, vice president of San Jac Marine. "We are already looking at building follow-on vessels."

Asked whether Green Diamond will lead the way for more plug-in hybrid electric towboats in Kirby's fleet, O'Neil said, "Green Diamond has been an incredible project of which we are extremely proud. There are operational and environmental benefits to the design, and we are exploring future possibilities across a range of options."

Feature

Great Vessels of 2023

Great Lakes Dredge & Dock Corporation

GALVESTON ISLAND

Delivered this year amid an ongoing dredge building boom in the United States, Galveston Island is the first in a series of two new 6,500-cubic-yard-capacity trailing suction hopper dredges (TSHD) designed by C-Job and constructed by Conrad Shipyard for Great Lakes Dredge & Dock Corporation as part of the Houston-based dredging contractor's fleet renewal program.

Chris Gunsten, SVP of project services and fleet engineering, Great Lakes Dredge & Dock, said the hopper dredge excels at working in offshore conditions and is particularly suited for coastal restoration and beach nourishment. "One really important factor of that type of work is being close to shore to limit your pumping distances," he said, noting the dredge's relative shallow draft for its capacity allows it to get closer to the beach, to be more efficient and to use less energy to get the work done.

Central to Galveston Island's efficiency are its Wabtec EPA Tier 4 powerplants, engines that achieve performance without the need for urea. "We wanted to get as efficient as possible without the need for the urea after treatments that are at costly and cumbersome to manage at times," Gunsten explained. "These engines also have the biofuel capacity. That's not widely available in a lot of markets [now] but they have that option."

The removal of aftertreatment, according to Patrick Webb, senior director sales - global marine and stationary at Wabtec, makes the system smaller and simpler for the customer. "So we reduce that cost, that operation complexity and make it much simpler to operate with a plug-and-play medium speed 900 RPM engine system," he said. "We've tried to make build and design this engine to fit in a lot of our competitor's footprints from the last 50 years of legacy engines."

Urea tanks can range up to 10,000 gallons, compounded by a USCG requirement for crawl spaces around the tanks in the event of a leak, Webb noted. "[Urea tanks are] big structures that are very expensive to build; that goes away with the Wabtec Tier 4. We don't have those tanks, so designers can use that space for carrying capacity. If it's a hopper dredge, they can have larger hoppers," Webb said.

In confirming the engine choice, Gunsten said, "In essence, the hopper dredge is a cargo vessel and it works on a cyclical basis multiple times per day. So, the more sand we can carry, the better off we are. Minimizing weight is an important consideration for that type of vessel and it links right into the reduced weight of the engine as well as the lack of the after treatment (weight)."

The dredge is equipped with a direct high-power pump-ashore installation, dredging system automation, dynamic positioning and tracking. Gunsten reckons that more than ever software and cloud computing are central to dredging efficiency. "Having a new modern vessel with a modern dredge control and monitoring system (DCMS) allows us to optimize," he said. "Bridging on that and working into this new cloud-based world, she can broadcast that data and we can access that anywhere in the world, specifically here at our headquarters in Houston, where we plan to set up a data center to look at that information and have our experts analyze that real time. [This means] there's no lag in those optimizations [and we] get the most out of the investment in this new vessel."

The newbuild will replace one of the older hopper dredges in the Great Lakes fleet, Terrapin Island, which is scheduled to has been taken out of service following a 42-year working history. A sister-ship to Galveston Island is currently under construction at Conrad, with steel cut in late 2022 and expected delivery in 2025.

Eastern Shipbuilding Group

Florida shipbuilder Eastern Shipbuilding Group (ESG) this Spring delivered R.B. Weeks, a 8,550 cubic yard capacity trailing suction hopper dredge constructed for Weeks Marine, based in Cranford, N.J.

"It's our pleasure to once again deliver a quality vessel on time and on budget to our valued customers at Weeks Marine, Inc.," said ESG's CEO and chairman of the board, Joey D'Isernia. "The R.B. Weeks joins an impressive fleet that works alongside the Army Corps of Engineers to preserve our treasured waterways."

Despite building the vessel through the height of the COVID-19 pandemic, ESG's workforce was able to deliver the vessel on schedule. The Royal IHC-designed R.B. Weeks was constructed at ESG's Allanton Shipyard and was launched on June 17, 2022. The vessel outfitting and trials were conducted at ESG's Port St. Joe Shipyard.

According to Weeks Marine president and CEO Eric Ellefsen, the delivery of R.B. Weeks is a significant milestone for the company and the largest capital investment in Weeks Marine history, which spans over a century. "We look forward to putting the R.B. Weeks to work deepening and maintaining navigation channels, restoring storm-damaged coastal barrier islands and nourishing beaches lost to erosion, aiding the U.S. Army Corps of Engineers and other key clients," he said at the time of delivery.

The R.B. Weeks is named in honor of Richard B. Weeks, a co-founder of Weeks Marine and married to Magdalen Weeks, the namesake of the nearly identical sister vessel Magdalen (ESG 256), built by ESG and delivered in 2017.

Like the Magdalen, R.B. Weeks includes a top-tier dredging machinery package by Royal IHC which includes dynamic positioning and powerful dredge and jet pumps that will efficiently load and unload the vessel. R.B. Weeks has a hopper capacity of 8,550 cubic yards and includes an electrical power, propulsion, and dredge machinery package by Royal IHC. It is equipped with twin Wabtec (GE) 16V250 MDC IMOIII/EPA Tier 4 engines driving a pair of Wartsila controllable pitch propellers (CPP) in nozzles through Siemens (Flender) reduction gears, as well as a Wartsila fixed pitch tunnel unit bow thruster, two Hyundai main generators, GE 6L250 MDC IMOIII/EPA Tier 4 / Hyundai auxiliary generator and Caterpillar C18 IMOII/EPA Tier 3 emergency generator.

With capacity for 26 persons on board, the dredge boasts several accommodation and crew comfort upgrades. It is classed by Lloyd's Register (+100A1 Hopper Dredger, +LMC, UMS).

Feature

Great Vessels of 2023

Great Lakes Dredge & Dock Corporation

CAPE HATTERAS & CAPE CANAVERAL

Damen's Multi Cat multipurpose workboat design, well proven in European markets, has made its entry into the U.S. Jones Act market with the construction of two new workboats—Cape Hatteras and Cape Canaveral—for Houston-based dredging contractor Great Lakes Dredge & Dock.

While the Netherlands-based Damen does not physically build for the Jones Act market, it commonly licenses its designs for U.S. yards to build. Earlier this year, Conrad Shipyard in Morgan City, La. delivered Great Lakes' two new Damen 3013 Multi Cats under this arrangement.

Offered in several configurations and sizes ranging from roughly 41 feet to 120 feet, the Multi Cat can be categorized as a utility/support vessel, often described as a "Swiss Army Knife" type of workboat, engineered for heavy-duty work in inland and nearshore shallow water settings, or deeper waters farther from shore.

"The Multi Cats are designed as multifunctional tools for maritime construction and dredging support," a Damen spokesperson told ***Marine News*** when the vessels were ordered in 2021. "The barge-like hull shape provides a lot of deck space for the works on deck, and also enhance the stability that these vessels need for their lifting capabilities, with their massive deck cranes that will be placed on board."

Great Lakes' new vessels measure approximately 99 feet in length and are each powered by three EPA Tier III Caterpillar C32 TTA engines capable of meeting speeds of 10.2 knots and will have maximum bollard pull of approximately 32 short tons.

For Great Lakes Dredge & Dock, which gained previous experience working with Damen Multi Cats over the course of several international projects, the newbuilds will be used as dredge support vessels, equipped with two large winches and two deck cranes to perform a wide range of tasks including handling submerged and floating pipelines as well as anchor handling and logistics supply.

Cape Hatteras and Cape Canaveral boost efficiency by allowing additional floating support equipment to be removed from the picture, said David Johanson, senior vice president for project acquisition and operations at Great Lakes Dredge & Dock. "For decades, dredging pipelines have been installed and maintained with an assortment of

floating equipment, such as derricks, anchor barges, tugboats and pontoon tanks," he explained. "The Multi Cats will improve our operating efficiencies by eliminating the need for multiple vessels to perform these tasks."

Improved safety is another benefit. "The Multi Cat brings step change safety improvements to Great Lakes' dredge pipeline operations, which was a prime driver for the investment," said Chris Gunsten, Great Lakes' senior vice president of project services and fleet engineering. "Pipe handling and connection work can now take place securely on deck, which will greatly reduce the risk of man overboards."

"These vessels will also enhance and improve Great Lakes' pipe and anchor operations. Further, the Multi Cats' two crane and multiple winch and wire tugger arrangements will significantly reduce manual work and the risk of soft tissues injuries. These vessels support our strong safety culture and gives us the ability to dredge with enhanced operating efficiencies needed to maintain our shorelines and waterways."

Damen vessels are often built to a stock design with options for modifications or enhancements. Being the first-of-their-kind U.S.-flag Multi Cats, Great Lakes' new Damen workboats have been modified to meet regulatory requirements such as ABS Load Line, U.S. Coast Guard Subchapter M, Jones Act and U.S. Army Corps of Engineers requirements, Johanson said. "Our internal team of mechanical engineers and naval architects collaborated with Damen and Conrad Shipyards to meet all regulatory requirements, and also to improve the workability and safety of the vessels."

Feature

Great Vessels of 2023

San Francisco Bar Pilots

The San Francisco Bar Pilots provide pilotage service in the San Francisco Bay and tributaries. When it came time to build a new launch to replace one of their older vessels, they sought a design that's proven, safe and heavy weather capable. They also needed a vessel that could live up to their operational speed and endurance demands while also complying with U.S. EPA Tier 4 and California Air Resources Board (CARB) emissions requirements.

What they ended up with was Golden Gate, a 67-foot-long, all-aluminum pilot boat with a double chine hull, designed by Camarc Design in the U.K. and built by Seattle's Snow & Company. The vessel entered service in September, and based off pilot feedback, it's safe to say the new launch has met their demands.

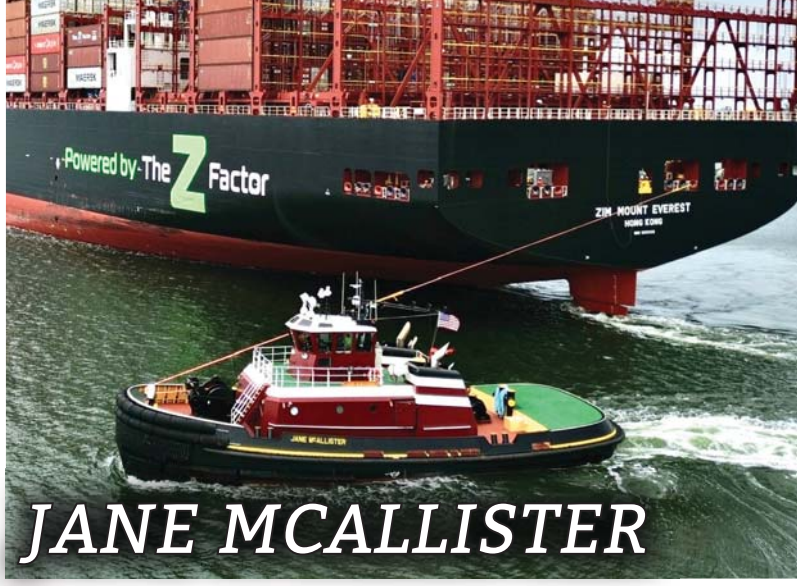
"Camarc Design is a well-known pilot boat architect, and the new Refined Hull model is an excellent pilot transfer platform," said San Francisco Bar Pilots' Capt. David McCloy, who was integral in the design and construction processes of the new vessel. "The builder, Snow & Company, has been a great partner in the project, and they have provided our group with a high-quality pilot vessel,"

Powered by a pair of MAN D2862 LE 438 1,200HP U.S. EPA Tier 4 engines that drive Hamilton HTX52 waterjets through Twin Disc MGX 6599 SC gearboxes, Golden Gate is capable of hitting 32 knots at top speed and cruises at 25 knots at 85% MCR. The vessel is also equipped with two Northern Lights M944T3F 38kW generators.

With onboard capacity for two crew and up to 12 pilots, the new Golden Gate—which replaces a 30-year-old vessel of the same name—is a quiet, comfortable work platform, McCloy said. The boat, at 73 feet LOA including jets and platform, with a 20-foot beam and 4-foot draft, features Humphree interceptors for a smoother ride, and sound levels at full throttle are 64dBA. A robust HVAC system provides fresh air and humidity control in the wheelhouse. For safety, Golden gate is equipped with an improved hydraulic man overboard recovery system.

"The pilot's reactions have been very positive. Fit and finish of the vessel, comfort, ride quality, low noise and vibration and excellent visibility are the biggest highlights," McCloy said. "One of the main priorities of the project was noise reduction, comfort and ergonomics for the crew. Our boat crews work long shifts for years on our vessels, and there are negative long-term effects of high noise and vibration environments."

The vessel features Furuno FR 2228BB/NXT radar, Furuno FA170 AIS, Furuno SC70 GPS, Furuno SC70 GPS compass and Ritchie mag compass, Furuno FM8900S radar, Rotheta RT-500-M integrated radio direction finder with Luminell CLITE2 IR LED searchlight and FLIR camera for MOB, Boning command and control system with flat panel touch screens for systems operation, alarm monitoring, Rose Point ECS electronic navigation and CCTV/FLIR cameras.



McAllister Towing's new tug Jane McAllister entered service this summer as one of the most advanced and powerful shipdocking tractor tugs operating in the Port of Virginia.

Constructed by Washburn & Doughty Associates, Inc. in East Boothbay, Maine, the 6,770-horsepower vessel packs a punch, equipped with 3516E Tier IV Caterpillar engines powering twin Schottel SRP 490 Z-drive units. The 93- by 38-foot tug features Markey winches on the bow and stern and achieved over 91 short tons during its ABS bollard pull certification.

McAllister president and CEO, B. Buckley McAllister, said, "We are proud that the Jane is the 10th tug in our fleet with over 80 metric tons of bollard pull and escort capability, making our fleet one of the best in the country for the larger ships entering into service."

When the Port of Virginia's dredging and widening program is complete in 2024, the Norfolk Harbor will offer the deepest, widest channels on the U.S. East Coast and commercial channels will allow safe, two-way traffic for fully laden ultra large container vessels.

"The Jane will not only meet, but exceed the needs, handling the ever-increasing size of vessels calling Virginia. This tug is joining our fleet of six other tractor tugs, and will enable us to continue safely handling the gentle giants calling the Port of Virginia," said Captain J. Elliott Westall, McAllister Towing of Virginia's vice president and general manager. "Having exceptional control and power, the Jane is the new 'Queen of Hampton Roads', and everyone that works on or with her can be confident in her abilities to deliver unsurpassed service for our customers."

Feature

Great Vessels of 2023

All American Marine

SHACKLEFORD

Built to service the growing offshore wind market as well as accomplish many other scientific survey missions, Shackleford is a 73- by 26.7-foot aluminum research and hydrographic survey vessel constructed by Bellingham, Wash. shipbuilder All American Marine (AAM) for the growing fleet of Geodynamics, an NV5 company.

Designed by Nic de Waal of Teknicraft Design in Auckland, New Zealand specifically for site development and cable surveys for offshore wind and telecommunications for extended 12- or limited 24-hour operations, the newbuild leverages fundamental design elements of the Duke University Marine Lab's Shearwater and Blue Tide Puerto Rico's Blue Manta—both built by All American Marine for operations in near-coastal research environments. The Shackleford integrates Teknicraft's signature symmetrical and asymmetrical combined hull shape, bow wave piercer and a patented hydrofoil-assisted hull design. The hull and hull components are designed to break up wave action and ensure reduced drag while enhancing passenger comfort and survey conditions.

From its homeport of Beaufort, N.C., Shackleford will serve an integral role in Geodynamics' mission of providing turnkey single pass offshore surveys and has been specifically customized to perform specialized nearshore and mid-shelf hydrographic and geophysical survey operations for the burgeoning offshore wind sector on the U.S. Eastern Seaboard.

To reduce survey mobilization costs, Shackleford is outfitted with fully dedicated and redundant survey systems, including a Kongsberg EM 2040 MKII multibeam echosounder deployed through the vessel's moonpool via retractable strut. Dimensional Control (DimCon) surveys utilizing applied metrology techniques orient the Shackleford's primary IMU/multibeam reference systems, and a network of discrete benchmarks set within the vessel's reference frame allowing accurate and repeatable lever arm calculations to all survey sensors. Coordinate Uncertainty Analysis of the final DimCon survey establishes an overall RMS of 0.0001 meters between all established points within the network.

"To achieve the highest level of data accuracy day in and day out, our model over the last two decades is simple: we consider the boat as a precision survey instrument, purpose built for the specific survey environment and then wrapped around the ideal sensors for a specific set of missions," said Chris Freeman, SVP at Geodynamics. "This new best-in-class vessel will provide an unmatched platform for our continued focus performing to the most stringent offshore survey specifications in the world, whether that is for nautical charting or for subsea exploration to support offshore wind development."

Capable of 18- to 24-knot cruising speeds, Shackleford is equipped with twin EPA Tier 3 Caterpillar C-18 diesel engines rated at 803 hp at 2,100 RPM that drive two fixed pitch propellers through ZF 665V remote mounted gearboxes. The vessel has two 21 kW Northern Lights generators.

With a large fuel capacity of 1,500 gallons, this fuel-efficient design is licensed for up to 16 day passengers and has live-aboard accommodations of up 10 passengers. On board the vessel, passengers and crew have comfortable quarters, large state-of-the-art lab spaces, and a full range of hydrographic and marine geophysical instrumentation. Shackleford offers five dedicated computer stations, three bunkrooms, two heads and a full galley.

Ron Wille, All American Marine president & COO, said, "This vessel will enable Geodynamics to take their business to the next level, provide unmatched services and expand their scientific activities on the east coast significantly. The vessel will also help advance the rapidly growing windfarm industry on the East Coast and beyond."

Derecktor Shipyards

MARCELLE MELOSIRA

Marcelle Melosira is a research and teaching vessel operated by the Rubenstein School of Environment and Natural Resources at the University of Vermont (UVM). The 64-foot-long aluminum catamaran was designed by Chartwell Marine in the U.K. and built by Derecktor Shipyards in Mamaroneck, N.Y. to serve as a floating classroom and laboratory on Lake Champlain.

Notably, the boat runs on a Hybrigen propulsion system engineered by BAE Systems for lower emissions and reduced fuel burn. The diesel-electric hybrid system features two electric motors, lithium-ion batteries and two 306-horsepower Cummins diesel generators. For added efficiency, the vessel boasts a custom catamaran hull construction designed to minimize resistance on the hull and ensure stability in windy conditions. The vessel is also equipped with dual control stations to maximize operability, and offers a large interior space and an expansive exterior aft deck area.

"The new hybrid electric vessel is one of the first of its kind for research and teaching, fully equipped to expand UVM's cutting-edge world-class research, deliver hands-on education programs to students of all ages, and welcome the public to learn about the mysteries, wonders and significance of our great Lake Champlain," said Jason Stockwell, director of the Rubenstein Ecosystem Science Laboratory.

While the vessel will be used for limnological, fisheries and geophysical research, it will also host public outreach trips with partner organizations, including many hands-on educational trips for regional K-12 schools. The vessel can accommodate up to 29 passengers and three crewmembers, a 10-person capacity upgrade over the previous vessel.

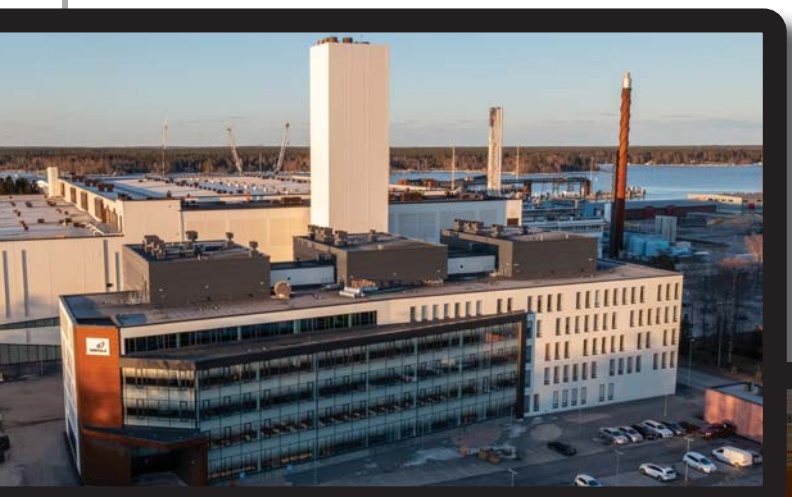
Marcelle Melosira features a modular laboratory classroom that can easily be reconfigured to support evolving scientific and teaching needs. A first-of-its-kind electric winch, designed by engineers at the Woods Hole Oceanographic Institution, is located on the topside deck and is essential for deploying scientific instrumentation such as water column profilers, camera systems and plankton nets. The vessel will also facilitate the launch and recovery of small remotely operated vehicles (ROV).

Stockwell described the vessel as an incredible resource for students, community partners and researchers. "With increased capacity, state-of-the-art equipment, and an improved classroom environment onboard, the Marcelle Melosira greatly enhances our ability to do impactful research and education."

Tech File

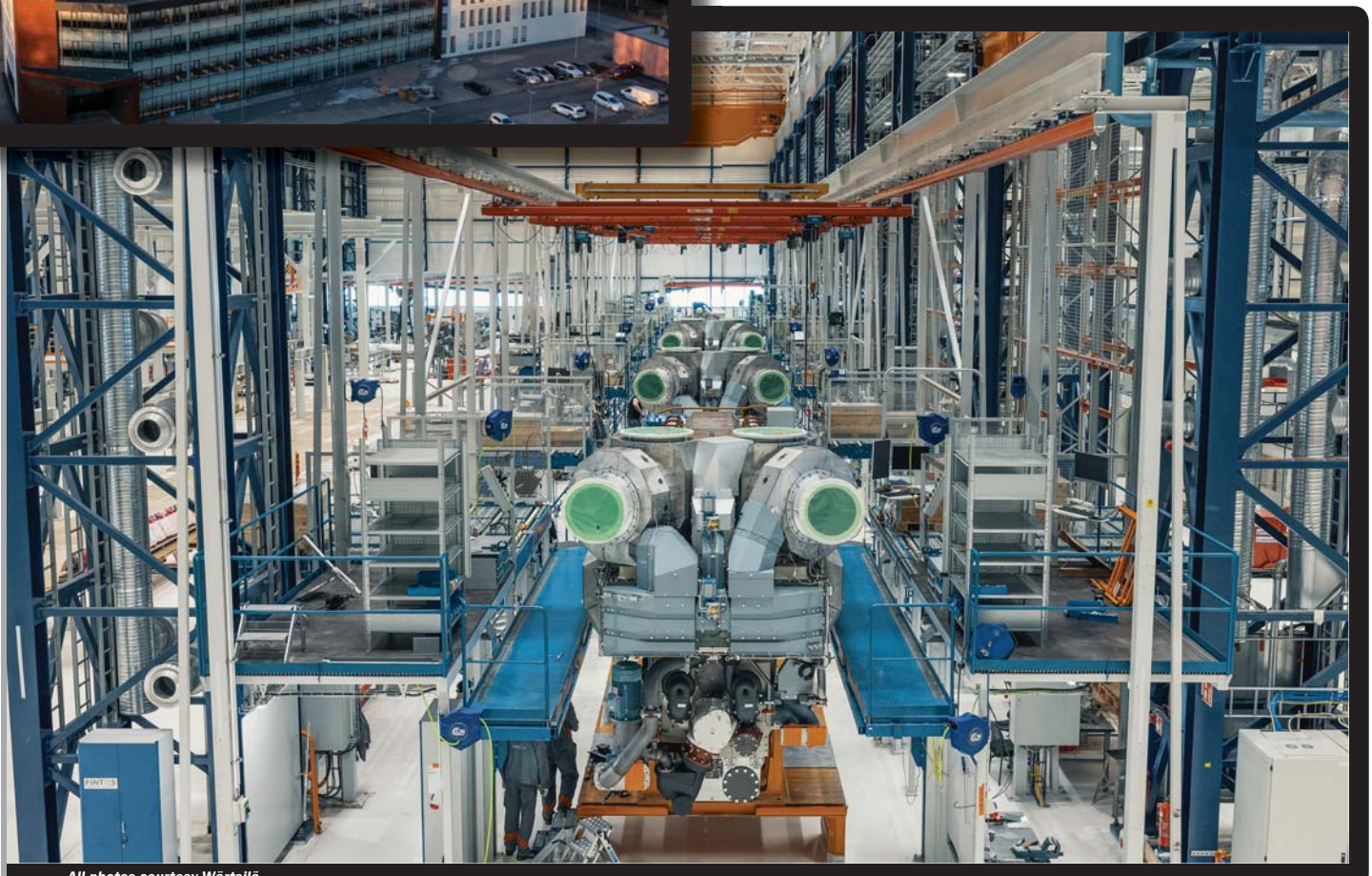
Inside Wärtsilä's Sustainable Technology Hub

By Eric Haun



"If we are to state our strategy in one word, it's decarbonization," said Juha Kytölä, director of R&D and engineering at Finnish tech company Wärtsilä. "What we are going toward is to supply the market with a portfolio of products that are ready for zero-carbon fuels."

In order to achieve its sustainability goals—including a 2030 target for carbon neutrality in its own operations—Wärtsilä has been taking big strides in research and development, having ramped up its investment on this front in



All photos courtesy Wärtsilä

recent years, Kytölä said. In 2022, the company dedicated €241 million (about $255 million) to R&D expenditure, or 4.1% of its net sales, up from €165 million (about $175 million) and 3.2% in 2018.

In particular, the company has been working to maximize the efficiency of its portfolio of gas, diesel and dual-fuel engines, while also developing its next wave of products capable of running on carbon neutral and carbon free fuels. In 2022, it introduced the Wärtsilä 32 methanol engine, and an ammonia concept is slated to be ready by the end of this year, followed by a hydrogen concept expected in 2025.

To help reach its decarbonization objectives, Wärtsilä invested €250 million in the creation of its state-of-the-art Sustainable Technology Hub (STH) in Vaasa, Finland, officially opened in June 2022 to foster innovation, collaboration and production of green technologies.

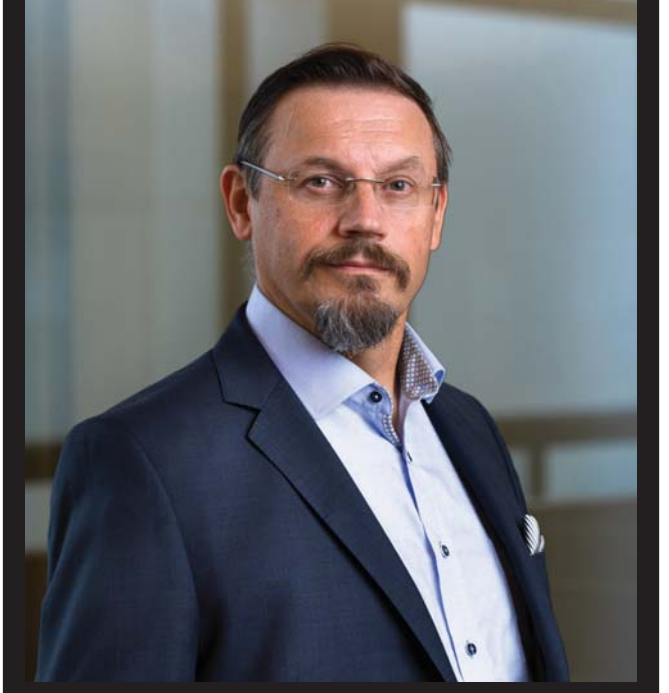
The facility features a modern fuel laboratory, technology and engine testing facilities, remote monitoring center, as well as a state-of-the-art production system with high levels of automation and flexibility for meeting tomorrow's evolving technologies. The center itself, which employs about 1,500 people, is also energy efficient, with advanced energy recovery systems that enable self-sufficiency for heat energy. Electricity produced while testing is used in the hub's own processes, while remaining power is fed to the grid, and residue heat is stored and used.

Juha Päivike, Wärtsilä's director of logistics chain management and STH facility stream, said the first element of the STH to be launched was its partner campus, which serves as an "ecosystem of collaboration" by bringing groups of experts together to drive meaningful innovation.

"What we want to see is that we accelerate this [shift to green technologies]. We want to be in the driver's seat. We need to then have the proper facilities for our experts to be close to the innovation, to collaborate with other companies, other bid partners, customers, even universities and academia, research institutes," he said. "The innovation cycle is getting faster and faster, so you need to adapt to new ways of how you tap onto these possibilities—and not always using your own efforts to develop something uniquely for yourself, but looking at partnerships where you can jointly benefit from the innovation."

An example of the type of collaborative work underway is the Wasaline dual-fuel LNG ro-pax ferry Aurora Botnia, which makes daily transits between Umeå, in Sweden, and Vaasa, docking a short distance from the STH facility.

The 150-meter-long vessel, touted by its operator as one of the world's greenest, features an integrated package of Wärtsilä solutions, including four Wärtsilä 31 engines; exhaust treatment; LNGPac technology for LNG storage, supply control and monitoring; tunnel thrusters; catalysators; integrated electrical and automation systems; and NACOS Platinum combined control system for navigation, automation and dynamic positioning as well as power and propulsion. All the Wärtsilä equipment and systems aboard the Aurora Botnia are covered by a 10-year Wärtsilä Optimized Maintenance agreement, and through an additional agreement with Wasaline, Wärtsilä is able to utilize the vessel as an R&D test platform and technology demonstrator—"a floating test lab" Päivike said.



Juha Kytölä,
Director of R&D and Engineering, Wärtsilä

Another important element of the STH is its unique manufacturing and logistics set up, which can be quickly adapted to meet new demands as technologies evolve and new products are created. "Flexibility has been a cornerstone for everything we do," Päivike said. "Instead of having product specific assembly lines, we are actually having assembly based on size of products and also having a lot of focus on new product introduction so that the manufacturability, quality, also the safe operations, etc., are all considered in the launch of any new product."

Wärtsilä is looking more at how it can link from product design and engineering all the way through manufacturing and operations, Päivike said, opening up new opportunities in areas such as 3D-based assembly simulations. "We are creating a more solid line from planning to manufacturing operations. This means that all the way from the design level we are directly linked to the shop floor, which means that there are more ways to improve efficiency."

People & Companies

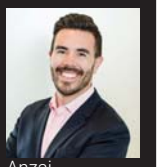

Mueller


Bukoski


Peakes


Dunsford


Merlino


Anzai


Gunderson


Powers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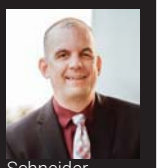
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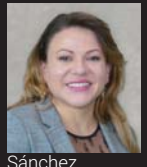
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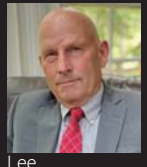
Lee


Norton

Mueller Elected Next SNAME President

NETSCo president and CEO Richard Mueller has been elected to become the next president of the Society of Naval Architects and Marine Engineers (SNAME).

USMMA Honors Bukoski

Jeffery Bukoski, president of St. Johns Ship Building, has been awarded the RADM Lauren S. McCready Award, which recognizes graduates of the U.S. Merchant Marine Academy (USMMA) who have made significant technical achievements in the marine industry or who have contributed organizational or managerial support to making such technical achievements possible.

Hornblower Makes Leadership Promotions

Hornblower Group has made several leadership changes: Adam Peakes has been promoted to president; Frank Dunsford rejoined the group as CFO; Francesca Merlino has been promoted to chief marketing officer; Phil Anzai has been named SVP of strategy and business development; and Melissa Gunderson has been promoted to SVP, global communications and brand.

Silver Ships Names Powers COO

Silver Ships promoted longtime employee Jason Powers from director of business development to chief operating officer.

Stoik Joins Ascot US

Pat Stoik has joined insurer Ascot Group as executive VP and head of marine, Ascot U.S.

Newport News' Horne Promoted to VP

David Horne has been promoted to vice president of trades at HII's Newport News Shipbuilding division.

Austal USA Hires Orlowski as VP

Austal USA has hired Chris Orlowski as vice president of engineering.

Schneider Joins Bollinger Mississippi

Bollinger Shipyards has hired Nathan Schneider as director of engineering for its Bollinger Mississippi Shipyard (BMS).

Port of Oakland Promotes Sánchez

The Port of Oakland has appointed Emilia Sánchez as its new director of engineering.

SAFE Boats' Board Adds New Members

William "Dean" Lee and Tom Norton have joined SAFE Boats International's board of directors.

Products

1 **VETUS Maxwell**

2 **In-Mar Solutions**

3 **CMB.TECH**

4 **TECO 2030**

5 **Honda Marine**

1. HPW Series Waterlocks from VETUS

The heavy-duty HPW series of waterlocks from VETUS can handle extreme conditions above 500 °F. A cost-effective option, these waterlocks feature rotating bodies and hose connections, a high-capacity water lift design, and excellent sound attenuation.

https://vetus.com/usa/exhaust-systems

2. In-Mar Solutions: Wynn Marine Pantograph Heavy Duty Window Wipers

Wynn Marine Pantograph window wipers are the ultimate solution for applications where complex window shapes need to be wiped effectively and economically. The wipers can be applied to anything from large commercial vessels to small and military vessels on land and at sea.

Pantograph wipers are available in a range of sizes from 2Nm of torque up to 110Nm with a wide variety of control systems and switch options. In addition, they can be supplied with heated arms and spray-jets.

www.inmarsystems.com

3. Dual Fuel Hydrogen Genset

CMB.TECH and DBR have developed a dual fuel hydrogen gensets for marine applications. The core of the dual fuel hydrogen genset is formed by the MAN V12-24l engine. The genset has a maximum output of 940kVA / 752 kWe at 60Hz (1800 rpm) and can operate on diesel or in dual fuel mode, sashing emissions by up to 83%. In a typical D2 duty cycle, 53% of diesel consumption and 12% of AdBlue consumption is saved. The genset is also available in 50Hz (1500rpm) which can deliver 822kVA of power. Damen Shipyards has ordered the first three hydrogen gensets that will be operated on Windcat's CSOVs.

4. FCM400 Fuel Cell Module

TECO 2030 has launched what it claims to be the world's most power dense marine and heavy-duty fuel cell module, the FCM400, which has approval in principle from DNV and is currently undergoing type approval process for maritime and heavy-duty applications. TECO 2030 says the modular 400kW fuel cell system includes industry leading energy efficiency, inherent safety concept, leading dimensions and component design and rapid dynamic load response. Its inherent safety concept includes a separate and independent safety system, venting arrangement, certified and field proven components, and robust containment systems.

5. Honda BF350 Outboard

Honda Marine has unveiled its first V8 outboard engine, the 350-horsepower BF350, powered by a 60-degree five-liter V8 engine with VTEC (Variable Valve Timing and Lift Electronic Control) technology. The BF350 will start off in BLAST (Boosted Low Speed Torque) mode, providing instant and powerful acceleration. At constant speeds ECOmo, will be engaged, where the engine's fuel optimization system will reduce fuel consumption whenever possible. When extra power is required, VTEC will boost peak power, providing a positive surge of acceleration. The BF350 also boasts a number of smart features, including Cruise Control, Tilt Limit and Trim Support. Accompanying the V8 outboard is the all-new BF350 controller.

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Kathleen Hickey	9/25/2023

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Marine News

January 2024

E-Magazine Edition

Design & Construction: Advances in Naval Architecture, Marine Engineering & Shipbuilding

February 2024

U.S. Offshore Wind

- Passenger Vessels
- Mariner Training & Education
- Safety Equipment

Event Distribution:
CMA: Mar 12-14, Stamford, CT

March 2024

E-Magazine Edition

U.S. Inland Waterways Transport: Operations, Infrastructure & Dredging

April 2024

Towboats, Tugs & Barges

- 2024 Shipbuilding Report
- Navigation Technology
- Power & Propulsion

Event Distribution:
OTC: May 6-9, Houston, TX

May 2024

E-Magazine Edition

U.S. Maritime Workforce: From Offshore to Inland Waterways & Shipyards

June 2024

Combat & Patrol Craft

- Navy & Coast Guard Shipbuilding
- Autonomous Vessels
- Workboat Communications Wind

Event Distribution:
Multi-Agency Combat Craft (MACC)
Marine Money Week, New York, NY

July 2024

E-Magazine Edition

The Green Marine Annual: Improving Environmental Performance & Efficiency

August 2024

Boatbuilding & Repair

- Naval Architecture & Marine Engineering
- Shipyard Equipment
- Dredging

Event Distribution:
SMM 2024, Hamburg, Germany

September 2024

E-Magazine Edition

Fast Craft: Patrol, Fire, Police, Pilot Boats & Ferries

October 2024

Vessel Repair & Conversion

- Offshore Energy
- Electrification & Alternative Fuels
- Deck Machinery & Cranes Autonomous

Event Distribution:

November 2024

Workboat Edition

- Top Vessels of 2024
- Top Tech & Service Innovations of 2024
- U.S. Shipyards

Event Distribution:
Int'l Workboat Show: Dec, New Orleans, LA

December 2024

E-Magazine Edition

Power & Propulsion: Technology Spotlight

Marine Marketplace

VESSELS FOR SALE / BARGES FOR RENT

NEW PRODUCTS

NEW PRODUCTS

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