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Marine News

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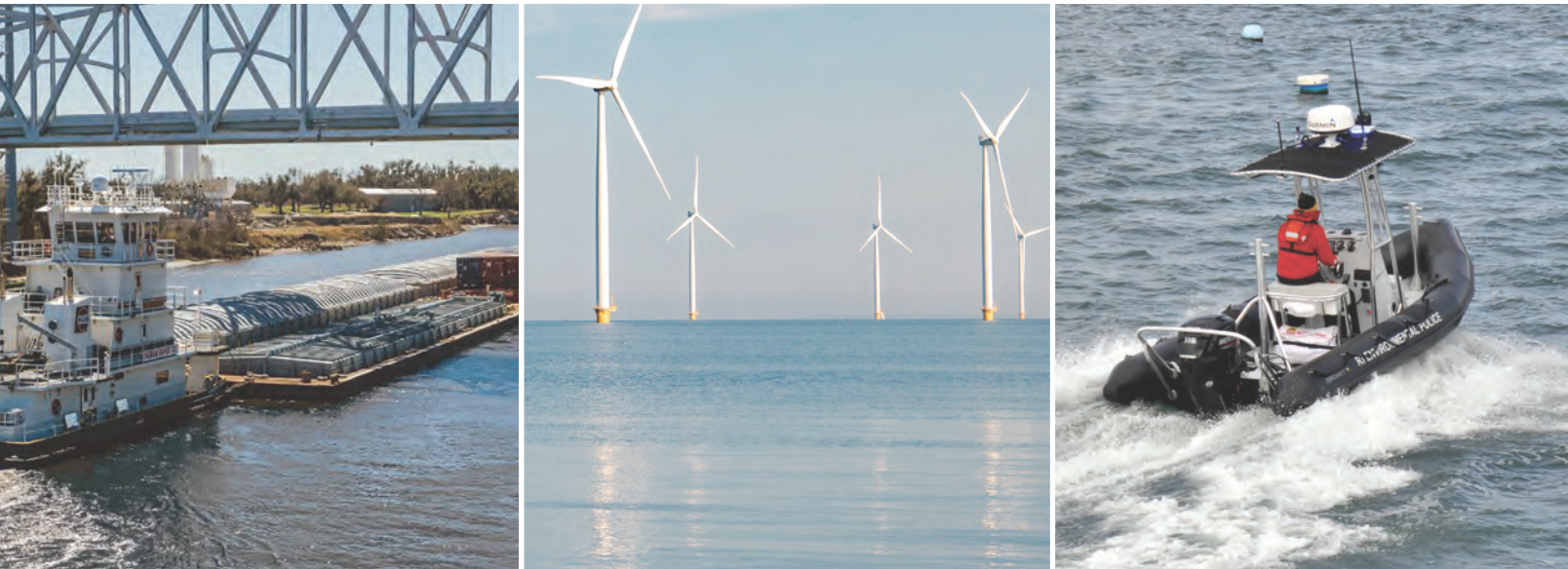
MN 100



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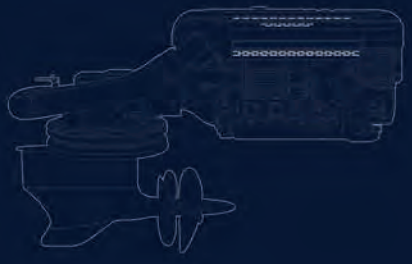

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Editor's Note

Eric Haun, Editor,
haun@marinelink.com

It's hard to believe that another year has passed and we're putting to press another installment of the MN100 edition. This special issue shines a spotlight on some of the leaders in the North American workboat market, from innovate tech startups to the most venerable firms that have been serving this vital industry for a century or more. As you know, the marine industry is in the midst of a considerable shakeup, with stakeholders exploring new technologies to drive efficiency gains and reduce emissions. Significant shifts are being led by new market entrants and well-established players alike—many of them featured in this issue.

Meanwhile, a newly forming offshore wind industry here in the States is creating massive opportunities up and down the marine supply chain, creating project and revenue streams for maritime, offshore, subsea, ports and logistics businesses and beyond for decades to come. This edition provides a look at a number of the firms that are making moves to become involved.

In addition, ***Marine News*** is honored to present this month an interview with one of the most high-profile leaders in the industry, Admiral Linda Fagan, the 27th Commandant of the U.S. Coast Guard and the first woman to lead a U.S. military service. Admiral Fagan discusses some of her top goals and priorities as she settles into the Commandant role, including ongoing efforts to maintain national security and facilitate global trade.

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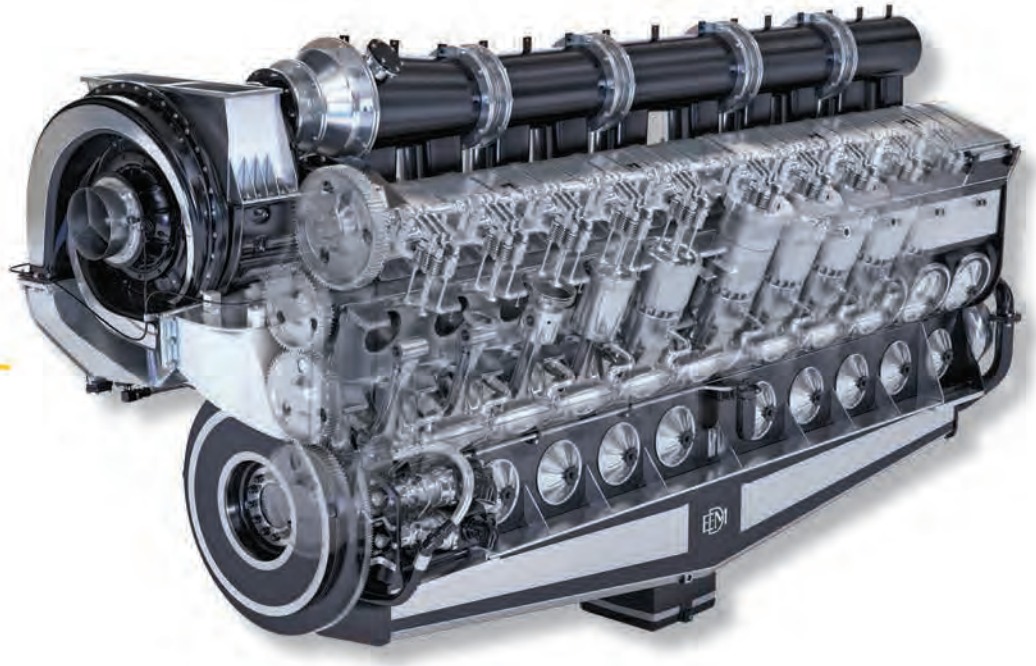

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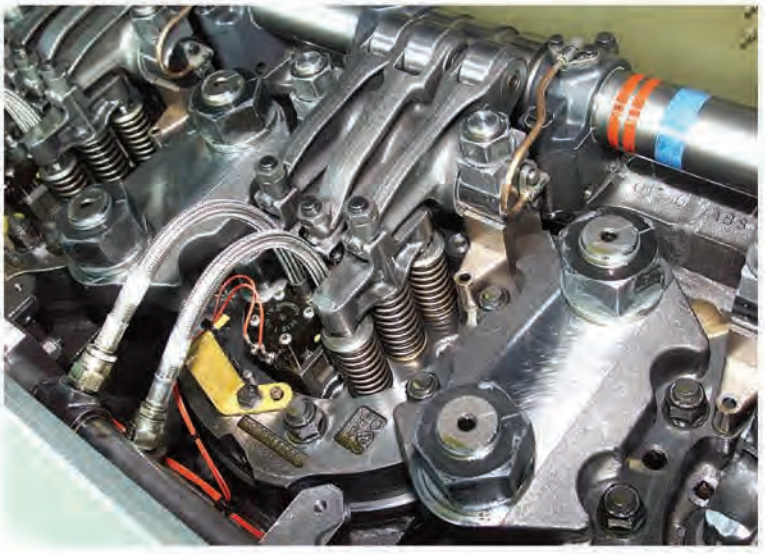

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Admiral Linda Fagan

27th Commandant of the U.S. Coast Guard

Admiral Linda Fagan *made history this year when she took over as the first female Commandant of the U.S. Coast Guard. In doing so, she also became the first woman to lead a U.S. military service. This month, Adm. Fagan discusses some of her top priorities as leader of the USCG, including ongoing efforts to maintain national security and facilitate global trade.*

U.S. Coast Guard

Much has been written of you being a pioneer, the first female commandant of the U.S. Coast Guard. What does it mean to you personally to break through this glass ceiling?

LF: I get asked that question a lot. I, frankly, am still kind of digesting just the significance of the job. I've been in the job about three months now. Really, where I kind of come down on it is just what a privilege it is to be leading the workforce that is the United States Coast Guard and my role to advocate for the service and the workforce. It really is a privilege to be able to do that for this incredibly talented group of people. It's what keeps me excited about coming to work. I'm really excited about where we are right now as a service and the opportunity in front of us. So while I may be the first, I can't wait to celebrate the next. In the meantime, really, I'm just focused on making sure that we've got the resourcing and advocacy that we need to serve the nation as the United States Coast Guard.

I know you're still relatively fresh to the commandant seat, but I'll assume you've been preparing for this job for some time. So with that in mind, what do you believe will be the most noticeable differences in your commands compared to your predecessors? And what are your top overriding priorities for the next 12 to 24 months?

LF: My priority, it's out publicly, my Commandant's Intent, [includes] three tenants and focus areas around the workforce and how we're executing mission, both from a feeling of capability standpoint and just our operating CONOPS and procedures. We're in the process of putting together a much more detailed strategy. Really, all three of the tenants are critical, but the work around our workforce and how we manage our talent is absolutely the most critical work that is in front of us.

We, like the other military services, are an off or an out organization. People come in at the entry point as either an officer or enlisted member, and then are forced forward on some fairly rigid timeframes with regard to assignments and moving and promotions. One of the things I've asked the team to do is to unpack those assumptions and seek opportunity for allowing people to lateral into the service, to change that sort of forced flow forward in a way that is more responsive to the reality of the workforce that we have today. That system was put in place, it's kind of a post-World War II system. It has served us well, and there are aspects of it that we'll need to retain, but we definitely need to lose the rigidity around it because there's nothing but opportunity in the service, and we need to make it easy for people to join and then to see themselves serving and staying as we move into the future with all the new assets and capabilities that we're bringing online.

You mentioned your 2022 Commandant's Intent. Under the section, "Sharpen Our Competitive Edge", is the priority to leverage data as the catalyst to transform the Coast Guard strategic advantage. Can you put some meat on the bone here with examples? In what areas are leveraging data most urgent?

LF: One of the first things that we need to do around data—and we've got what we're calling a Data Readiness Task Force stood up—is create the governance framework around the data that we create every day. Most organizations do. And whether it's doing an entry in the MISLE after having done a cruise ship inspection or a barge inspection or the search and rescue data with regard to cases, getting that into a framework and structure so that we understand where it is, what it is. And then allowing it to be analyzed, whether it's through artificial intelligence or machine learning or other filters in technology that's out there—all key tools that we need to bring into, and overlay with the data that we're creating right now. I'd like to be in a position where we've been able to analyze every counter-narcotics interdiction that we've done, say, for the last six years, and then apply predictive analytics to where are you likely to experience the next interdiction.

In the maritime migration flows and realms, similar kind of opportunity there. In the commercial vessel and commercial safety realm, right now we drive inspections and requirements based on rigid timeframes. If we've got the data governance correctly and are able to run the analytics, you can get to the point where you can predict where you may have a higher risk vessel based on the entirety of its operating parameters and safety history, as opposed to the very rigid time-based systems that we use now. Well, I'd say step one is getting the data into a coherent framework and governance so that we can begin getting insight from it in

Benjamin Applebaum / DHS

Adm. Linda Fagan relieves Adm. Karl Schultz as the 27th commandant of the Coast Guard during a change of command ceremony at Coast Guard headquarters June 1, 2022.

a way that then is more responsive to the actual risk that we're trying to mitigate and buy down.

The economic value of a well-running maritime system has come to the fore recently with logistical snarls jamming ports globally. Viewing this problem through the Coast Guard lens, what do you consider to be the biggest problem, and what is the status today? What could or should the Coast Guard be doing to help facilitate a solution?

LF: $5.4 trillion in annual economic activity and 30.8 million jobs across marine transportation system; our well-being, economic prosperity as a nation rides on the marine transportation system. This is about global competition. It begins at home, and our ports play an absolute critical role in not just the U.S. economy but the global economy. We've certainly seen some of the fragility in the system as we've gone to just in time deliveries. So as consumer demand has ebbed and flowed as labor shortages have played out and overseas manufacturing's delayed rate, we've seen all of the shocks to the global economic system that has occurred.

The Coast Guard's focus is in ensuring that all the elements of the marine transportation system here in the U.S., that they are reliable, resilient, that it's operating in a safe manner. So whether it's our work, our aids to navigation work to ensure that the harbors and waterways are marked that those ships can come in safely, or the vessel traffic services (VTS) that we run in a number of harbors around the country, the rain inspector work that we do to inspect ships to ensure that they're compliant with U.S. regulations and law, and any number of other things is work that the Coast Guard has done for a while and will continue to do so that the system, again, operates resiliently and safely. And we certainly don't take that for granted. It is work that we do every day in the ports and the harbors in the country.

I think some of the other external surges will continue to be a challenge, but we will remain postured with all of the diverse waterway users and operators to ensure that we've got an optimized system here in the U.S. because, like I say, our very economic prosperity is tied to those critical waterways, not just the major ports along the coast, but we've got an incredible inland waterway system that drives considerable economic advantage. And we are committed to that work as well.

For the commercial maritime industry, this is a transcendent time with significant advances in areas such as automation, decarbonization and digitalization. In some cases, new vessel technology may be ahead of rules and regulations. How is the Coast Guard working with the industry to advance these in a timely, and more importantly, in a safe manner?

LF: You highlight this is always a tension point. In addition to being a military service and a law enforcement agency, a first response agency, we are also a regulatory agency, and we were committed to facilitating safe and secure elements of the marine transportation system, like I've just been talking about, but we do that through a proven regulatory regime. So as technology changes and the question of vessel autonomy, we remain focused on ensuring that we've got a safe, secure and resilient system. The way we do our regulatory rule making is obviously with significant consultation with those industries that we are regulating. I know it is not a fast process, but I do think it helps create the dialogue for informed regulations in a way that meets, again, the desire and the need to have a safe, secure and resilient system.

We engage with key stakeholders through a number of the different federal advisory committees and some of the Area Maritime Security Committees, and others that are captain of ports engage in regularly around the country. I think we have just a great process for having those conversations, and ensure that we've got the right insights and advocacy as we look at what and how there might be a regulatory need, particularly as it comes to just changing technology. The reality is, there's always a lag there. This is not new news, industry has always led the way.

When I was a new marine inspector back 35 years ago, the big thing was moving to automated engine rooms. We weren't even talking about unmanned vessels, but just a level of automation and the process to get to allowing for automated engine rooms, that just has continued to play on time. And now we're at the point we're talking about fully autonomous ships, new fuels. There'll be something else that in a couple years' time we'll be talking about, and we'll continue to work that collaborative process to ensure that regulation is informed and in responsive to both the system and the users.

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Lisa Ferdinando / U.S. Coast Guard

Coast Guard Commandant Adm. Linda L. Fagan provides testimony to the Homeland Security Subcommittee on Transportation and Maritime Security, on the state of the Coast Guard and her vision for the service, Washington, D.C., July 14, 2022.

What are the Coast Guard's priorities in the Arctic and how has recent Russian aggression impacted these?

LF: I get asked this question a lot too. And I always start with, we are an Arctic nation because of Alaska, and we have national security interest in the Arctic, which is why bringing the Polar Security Cutters online are so critical to us as a nation. Halter Marine has been contracted to build the Polar Security Cutters for us. We're building them through a joint program office with the Navy, but the Coast Guard will operate those vessels for the nation. Polar Security Cutter is my top acquisition priority. We've not fielded a brand new Polar Security Cutter or icebreaker since the mid '70s. I was on the Polar Stars as a young ensign, the ship was not new then. And then she is still in operation and it'll sail south for us here a little bit later this summer.

But just as the Russians have interest in their side of the Arctic, we have interest in our side of the Arctic, and you need to generate actual presence with a ship to ensure that we are enforcing and maintaining our own national sovereignty, particularly as it pertains to the exclusive economic zone. The high latitudes are increasingly of interest. China has declared interest as well in the Arctic. So having on the water presence to counter that is critical to our sovereignty as a nation. And like I say, we're pretty excited about getting those Polar Security Cutters fielded.

We also sometimes get asked about, obviously Russia has invaded Ukraine, and that's put on pause a number of multilateral engagement opportunities like the Arctic Coast Guard Forum, Arctic Council, North Pacific Coast Guard Forum. But when it pertains to the maritime boundary line that runs through the bearing, and the interaction that we as a Coast Guard have with our Russian counterparts along the MBL, that interaction, almost a daily interaction occasionally, a Russian fishing vessel will come right up to the maritime boundary line, or maybe just a little over. We have contact with our Russian counterparts who go out and bring that fishing vessel, ensure that it's back over the line. And so to the extent that it's important to maintain sovereignty and enforce along that maritime boundary line. I was just speaking with our D-17 commander who's based in June. In fact, just last week, we're having this conver-

sation. So those communications do continue as it pertains specifically to maritime domain there in the bearing.

Earlier you mentioned the importance of the U.S. port system, as well as inland waterway system. How close are we to the first Waterways Commerce Cutter construction award and what are the remaining steps before a contract is announced? Can you please describe the importance of these new vessels for the Coast Guard and for the maritime industry?

LF: The Waterway Commerce Cutters are absolutely critical to, again, ensuring the safety and resiliency of our inland waterways system in the Western rivers. They are as vital as our major seaports are to the movement of commerce and creating economic security and prosperity. We anticipate awarding the detailed design and construction contract for the first Waterway Commerce Cutter very soon. It'll be done as a small business set aside, and we are anticipating delivery of that first WCC as early as FY 2025. We're really excited about where we are with regard to soon awarding that contract.

We'll recapitalize 35 of the legacy inland tenders. To give you an idea on age on these, they were commissioned between 1944 and 1990. We'll price those 35 legacy cutters with 30 WCCs. There'll be three variants on it, 16 river buoy tenders, 11 inland construction tenders, and then three inland buoy tenders to ensure that we continue to meet, again, our obligations to the resiliency and reliability and safe navigation of those inland waterways. We're pretty excited about where we are. I've been here long enough. I can remember a time when we weren't even talking about the Waterways Commerce Cutters, and here we are with hopefully an announcement very, very soon.

Photo by Paul C. LaMarre III

Making the Waterways Work:

Five Profiles

This report profiles five U.S. tug and barge operators, highlighting each companies' operations, successes and challenges.

BY TOM EWING

Carlisle & Bray

"Our mission is to provide the safest most value added service to our customers whatever they may need," said Rob Carlisle, President, Carlisle & Bray.

Carlisle & Bray Enterprises is headquartered in Covington, Ky., directly across from Cincinnati, an interstate region with one of the busiest ports on the inland waterway system. C&B was established in 2011, but it has a deep history. C&B resulted from the merger of two long-standing Ohio River marine operations – Greater Cincinnati Marine and Bray Marine. C&B Enterprises LLC is parent company to C&B Marine, C&B Energy Services and C&B Repair and Maintenance.

Rob Carlisle, President; Scott Bray, CFO; and Dave Orme, COO; make up C&B's leadership team. Top concerns: safety and customer service.

C&B provides a full array of marine- and land-based services, as well as consulting and inspection capabilities. Ohio River operations extend from Pittsburgh to Cairo with four 3,000 HP main line vessels supporting carriers needing assistance or full towing capabilities for specialized moves. The towing fleet ranges from 1,200 to 3,000

Carlisle & Bray

HP vessels. The company also has a 160x60 1,600 ton dry dock at Ohio River MM 482.5. Services include complete design-build-construction and repair as well as dredging, barge loading/unloading and salvage.

C&B Marine operates four fleeting areas on the Ohio River and a heavy-lifting dock on the Licking River. C&B Energy Services serves utility and aggregate customers across the Midwest and southern states. It provides marine and shore-side services including byproduct movement and management, heavy-lift crane services, barge cleaning and waterway and shore-side construction.

One recent unusual assignment included helping the American Queen cruise ship after it encountered power failures. C&B's Enterprise pushed the vessel from Maysville, Ky. to Pittsburgh. On another occasion C&B Energy Services responded to an emergency in which a 300x54 foot barge broke in half. C&B used two large A frames to transfer 1,000 tons of equipment and product to a new barge. The customer was back in business in six days. C&B's motto: "Whatever it takes."

Looking ahead, C&B is pursuing partnerships with national transporters in which C&B would provide service on part of a river segment, say from Cairo to Louisville, thereby allowing its partner company to keep its focus, and equipment, on New Orleans, for example, or Memphis. C&B calls this its "express business," a service for which it believes it can provide greater efficiencies.

C&B expects an expanding business environment and accelerating growth. The company is involved in a new heavy lift dock project in Gallatin, Ky., at the Nucor steel plant site. Related site work includes energy infrastructure and dredging. Somewhat farther in the future Ohio and Kentucky, between Cincinnati and Covington, are close to building a new Interstate 75/71 Brent Spence Bridge, a massive project that will actually involve three bridges, at least. That work could start in 2023. C&B expects barges and large cranes will be in high demand.

Shaver Transportation

Shaver Transportation, headquartered in Portland, Ore. is a sixth-generation family-owned tug and barge line serving the Columbia-Snake River system in Washington, Oregon and Idaho. President: Steve Shaver.

Shaver provides ship assist, escort and rescue services for

deep draft vessels and dry bulk grain transport with its fleet of self-unloading covered barges. The company provides customized harbor and general marine services. It has managed break-bulk transport of over-sized North Slope drilling modules from Vancouver WA to the Pacific. Shaver was the first carrier to provide emergency river-to-ocean transport for juvenile salmon and other fish, established in response to summer river conditions. Currently 12 of Shaver's 16 tugs are constructed with Tier III and IV propulsion or were repowered from non-tiered to Tier II and III powerplants, greatly reducing fuel consumption and lowering emissions. A priority: "Constantly innovating with our fleet to be the most efficient and environmentally respectful carrier we can be."

A core Shaver strength: its employees, described as "incredibly stable and invested." Shaver has been able to attract top-tier, career minded professionals "whether multigenerational or straight from the hawsepipe or Academy." Shaver's team understands the company's central position in the northwest maritime environment, a commitment clearly demonstrated, for example, during the pandemic.

Shaver has two new tugs under construction. The company operates 20 dry bulk grain barges ranging from 2,500- to 4,200-short-ton capacity. In September two new 3,600-ton grain barges joined the fleet. The company operates four flat deck barges for inland assignments. It stands ready for vessel rescues, high, wide and heavy transport and just about any customized program.

One new operating initiative includes a move to paperless log sheets. Another is a virtual vessel maintenance and repair program (MobileOps), a move already benefitting vessel and shop crews and Shaver's operations team.

On the regulatory side, Shaver is keeping a close eye on volatile fuel costs, challenged by shifts in federal and state energy priorities. The company notes: "fuel stability means customer stability, a win-win for all." Shaver points out: "Waterborne transport in the United States is the only mode of transportation that has significant room to expand its volumes without adding a single piece of infrastructure."

Shaver Transportation

Vane Brothers

Vane Brothers, established in 1898, is headquartered in Baltimore. Its mission is to "provide customers with preferred, quality service that consistently meets or exceeds their expectations. We are committed to developing the safest possible marine transportation system achievable, with emphasis on preventing injury, loss of life, and damage to the marine environment and property."

Vane's 750 employees provide marine services at major US coastal ports and Great Lakes and Caribbean ports. It is a full-service, Jones Act compliant company specializing in petroleum transport. Services include ship bunkering, lightering, and heating oil and asphalt transport. The fleet consists of 49 tugboats and 80 barges. In 2022, Vane closed-out an aggressive 20-year newbuild program that delivered dozens of purpose-built tugboats and barges, including twenty 3,000-horsepower tugs built in Maryland. Vane can customize its IT and transportation services to address any customer needs.

By May of this year, 100% of Vane's tugs had a valid Subchapter M Certificate of Inspection - hitting this important goal nearly two months ahead of the Coast Guard's July 19 deadline. Safety is a high priority: preparing for inspections, audits and vettings is a regular focus for Vane's crews and personnel.

The company closely tracks its environmental profile, seeking ways to lower energy-related impacts. Some of Vane's tugs are using biofuel now. The company has started remote monitoring to track vessel fuel consumption and engine performance. This will allow real-time operational adjustments. Earlier this year, Vane donated a retired, 120-foot barge to the Ocean City Reef Foundation so that the vessel could be sunk to create a marine habitat at the bottom of the Atlantic. The foundation called this "a fabulous donation from Vane Brothers."

Some of Vane's unique operations include assisting with Deepwater Horizon clean-up efforts in 2010. Vane sent six tugs and six 50,000-barrel barges to the Gulf of Mexico to store and transport recovered crude. In 2018, four tugs and four barges completed Vane's first Panama Canal transit to launch West Coast operations. In late 2020, Great Lakes service started, operating a barge specially equipped to handle asphalt.

Looking ahead at challenges, Vane cited the patchwork of regulations that differ from state to state. Vane would prefer to respond to a single, federal regulatory body for consistency. Another critical issue: recruitment. Vane writes: "We need to be especially creative with our fleet recruiting practices." Vane cites terrific pay and benefits and a favorable schedule – most Vane Brothers crews work two weeks on the vessel and then get two weeks off.

On the opportunity side, Vane is closely watching the market for renewable fuels and other alt-energy developments. "The renewable fuel concept is a growth market for us," Vane writes. It will be ready when supply and demand turn into real business.

Ingram Marine Group

The Ingram Marine Group is headquartered in Nashville. The company includes the Ingram Barge Company, Custom Fuel Services and Ingram Logistics Services. Top officials are: Orrin Ingram, Chairman; John Roberts, President and CEO and Crystal Taylor CFO.

Ingram Barge operates throughout the U.S. inland river system. Custom Fuel Services has 10 locations along the Mississippi, Ohio and Illinois Rivers. Ingram Logistics

transports cargo anywhere, worldwide. The company's focus is on setting the river industry standard of excellence for quality, service and safety.

Ingram's roots are in the barge industry. The company currently has 140 towboats and approximately 4,000 barges for liquid and dry cargo and six fleeting locations. Custom Fuel Services provides dockside and midstream fueling, water, lubes and other supplies/services. The name is part of its mission: providing custom solutions in response to customers' individual needs. With its Logistics service, Ingram writes that it offers "endless customized solutions."

Ingram added three new towboats since 2020: Adrienne Moore, Tom Cornwell and Debbie L. Owen. Two more are expected in 2022: Captain Roy Daniels and Steve Alley. These vessels are named after long-time Ingram associates.

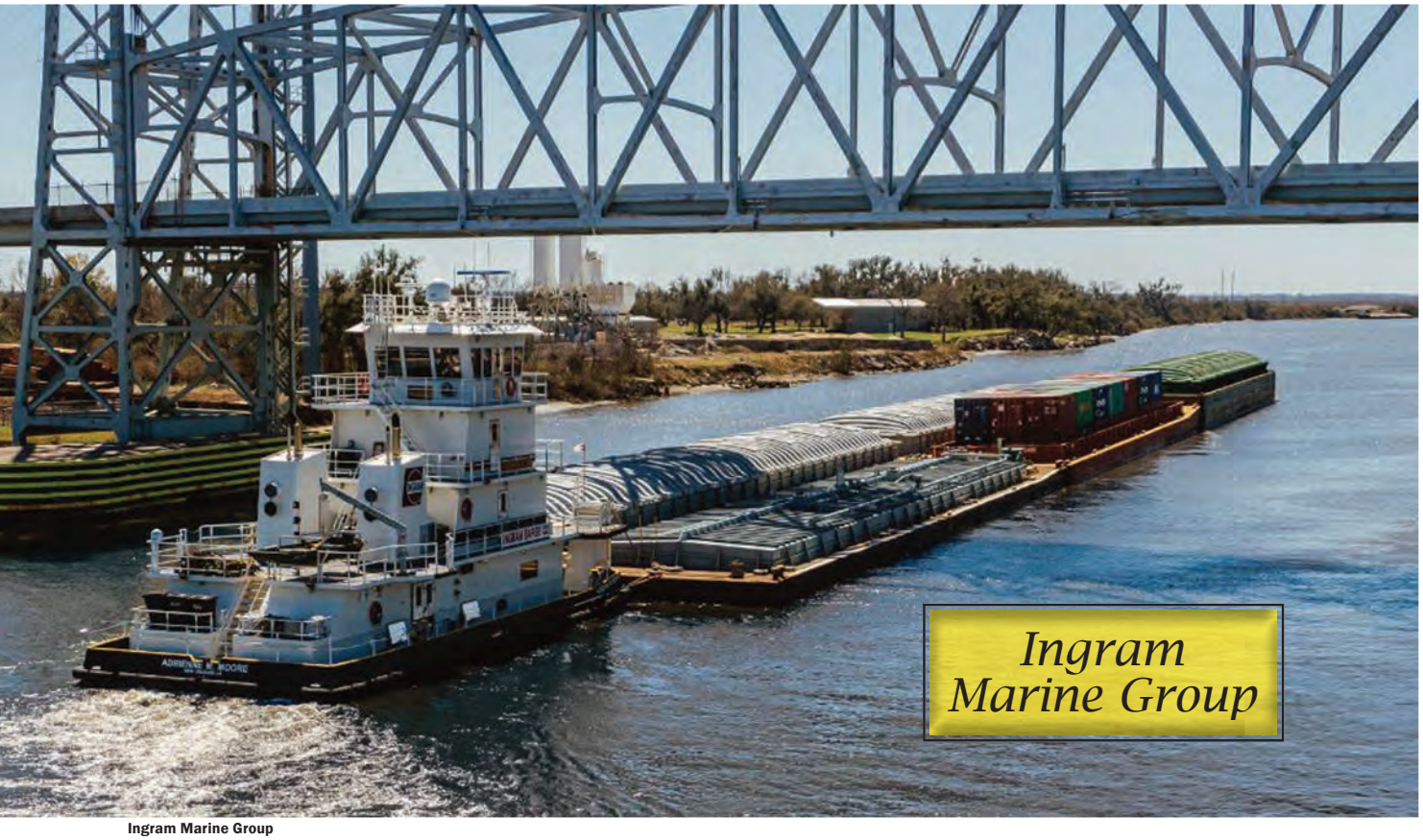
Ingram is upfront about its number one strength: its people, on board with the company's mission. "From the newest deckhand to our most experienced Captain," Ingram proudly declares, "we strive to provide the safest and most reliable cargo transportation with the best customer experience." Ingram strives for associates who are honorable, empowered accountable and driven.

Regarding environmental issues, Ingram has an intentional focus, across its businesses, on environmental, social and governance (ESG) practices. "We are always looking for ways to do things better and greener," the company writes. When replacing equipment, for example, from LED lighting to new engines to the company's scrap program, current performance is evaluated with an eye towards changes that will be greener in impacts and outcomes. Alternative fuels are being evaluated as well as dual and multiple engine technologies and applications.

As it looks to the future Ingram is closely monitoring Jones Act developments. Infrastructure planning and funding are top policy priorities. "We move cargo to and from 38 states and we have the least expensive, safest and lowest-carbon (transport) footprint," Ingram emphasizes, and adds: "Maintaining our waterways is critical to what we do and critical for our nation."

The Great Lakes Towing Company

Great Lakes Towing, headquartered in Cleveland, Ohio, and founded in 1899, is the parent company for three



Ingram Marine Group

divisions: Great Lakes Shipyard, Sarter Marine and Plotz Machine. Joe Stark is President, Gregg Thauvette is Vice President, Operations and Tom Rigolo is Vice President and Shipyard General Manager. The company strives to "serve the Great Lakes maritime community to the highest standards possible."

The Towing Company, as it's commonly known, has two business segments: harbor towing and ship assist and ship repair and construction. The company also provides long lake towing services, including dead boat towing and barge service, as well as groundings, and it provides ice-breaking, line handling and chartering.

GLT has 36 tugs in 13 ports between Duluth, Minn. and Buffalo, N.Y. Shipyard operations are based in Cleveland. The Company started a fleet renewal program in 2016 with construction of ten Damen-designed Model 1907 ICE, twin screw, EPA compliant 2,000 HP harbor tugs. The first tug was completed in 2017. Great Lakes Shipyard recently launched the seventh tug in the series and has started on construction of hull #8. This rebuild should be complete in 2025.

Sarter Marine and Plotz Machine are new acquisitions. Sarter Towing, along with six tugs, was purchased in March. Sarter is based in Sturgeon Bay, Wis. and serves regional shipbuilding operations. Last fall, GLT purchased Plotz Machine & Forage Co., a Cleveland machine shop established in 1888.

Central to the Shipyard's operation is the 820 metric ton marine Travelift, deliberately sized to lift the USCG's 140-foot "Bay Class" ice breaking tugs as well as barges with a beam of up to 54-feet. The Travelift is the largest on the Great Lakes and one of the largest in the world.

Looking ahead, GLT execs note evolving Great Lakes trade. Coal was once a primary cargo. Now, other energy markets are emerging. Wind turbine parts, for example, are regularly shipped on the Lakes and Seaway. Container transport is becoming more common—from Europe and from traffic diverted from backed-up coastal ports. Grain exports have increased due to the Ukraine war.

GLT notes that decreasing Lake water levels will likely boost the need for dredging, further likely to increase the need for shipyard repair services. Because the dollar is strong, GLT expects increased foreign vessel traffic on the Great Lakes.

The Great Lakes Towing Company

MN 100

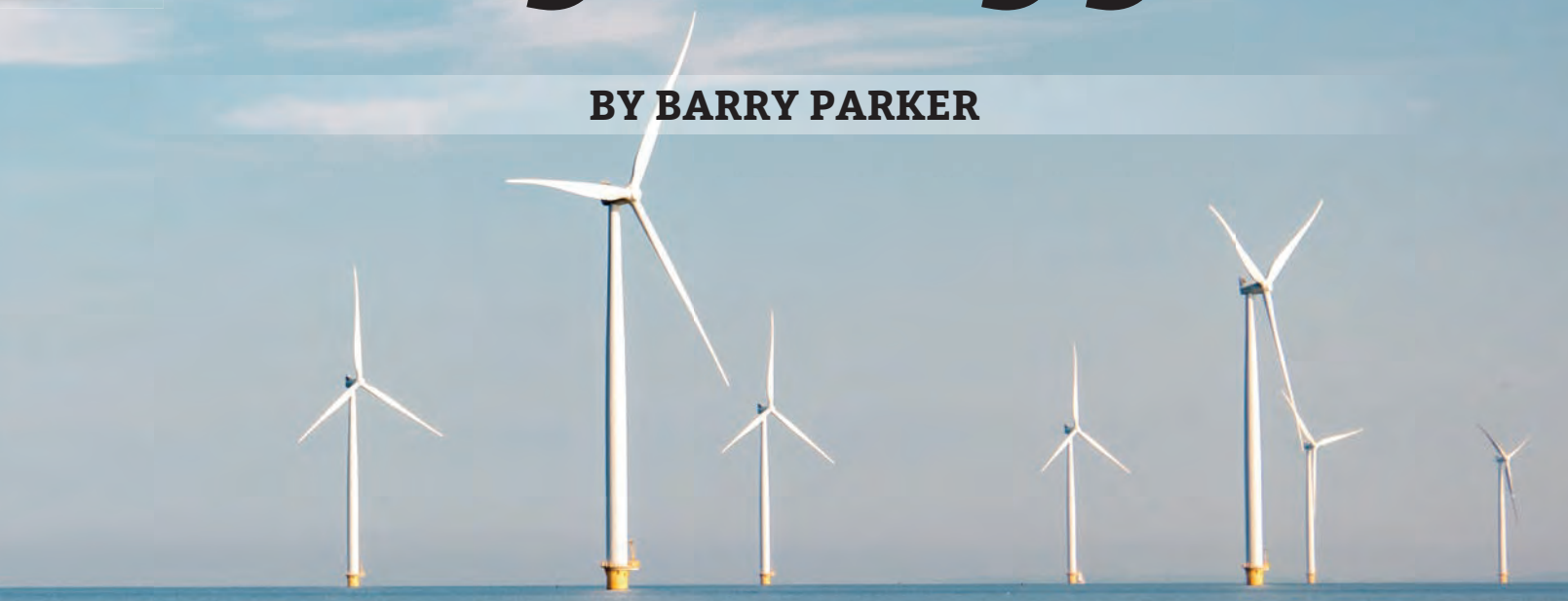
US Offshore Wind:

During 2022, U.S. offshore wind has morphed from a futuristic aspiration into something approaching "business as usual" for the maritime industry. With goals of expanding electricity generation from renewable sources, new offshore leasing initiatives by the Bureau of Ocean Energy Management (BOEM, part of the U.S. Department of the Interior), and, where leases have already been awarded- further progress in the chain of environmental and other approvals, have created a pipeline of real projects along the U.S. East Coast. "Getting to yes" is complicated, with leases in Federal waters awarded by BOEM, and purchases of electric power handled by individual states, with many stakeholders participating in reviews of environmental impacts and construction plans.

Two commercial scale projects are now moving ahead; with work on electrical interfaces already underway. The first phase of the Vineyard Wind project (owned by **Avangrid Renewables** and **Copenhagen Infrastructure Partners**), 15 miles south of Martha's Vineyard and Nantucket, will see 62 GE Haliade-X turbines (each 13 MW), producing 800 MW of electricity. With a cable interface at Barnstable (on Cape Cod), it will be tied into the electric grid. Farther south, the smaller South Fork project (to be developed by **Ørsted** and **Eversource**) in waters east of Montauk will see 130 MW produced by 12 **Siemens Gamesa** 11 MW turbines. (with an interface near Wainscott, Long Island, N.Y.). Projects moving along in the requisite approvals process include Ocean Wind 1 (Ørsted and **PSEG**), in waters off New Jersey, and an initial phase of US Wind

Preparing for *Lift Off*

BY BARRY PARKER



(backed by Italian renewables specialist **Renexia SpA**, with participation from **Apollo Global Management**), off the Maryland coast. Following up on multiple leases awarded in February, 2022, BOEM now intends to undertake a regional review of multiple lease areas in the New York Bight

Projects require a diverse complement of equipment, ranging from behemoth wind turbine installation vessels (WTIV) down to more agile crew transport vessels (CTV), with service operation vessels (SOV) and others in between. The electrical side of projects requires cable installation vessels. Presently, in the U.S. market, numerous survey vessels are active in advance of the actual installation of turbines, substations and underwater cabling. On the land side, ports from New England through the mid-Atlantic are already ramping up to support development of fields (and, ultimately, routine operations). Codified law (along with regulatory rulings) related to the Jones Act, which requires compliant assets for transporting people and equipment between U.S. points (a WTIV jacked-up on the seabed is so defined), will continue to exert a powerful influence on operating practices, and equipment choices.

WTIVs, for installing the turbines, are tremendously expensive. The two small fields currently operating in U.S. waters (Block Island Wind- with five 6 MW turbines, and a pair of similarly sized turbines operated off Virginia Beach by Ørsted for **Dominion Energy's** Coastal Virginia Offshore Wind, or CVOW) have utilized non Jones Act WTIVs in conjunction with barging of components out from the landside. Presently, one Jones Act compliant WTIV said to cost around $550 million, Charybdis, is un-

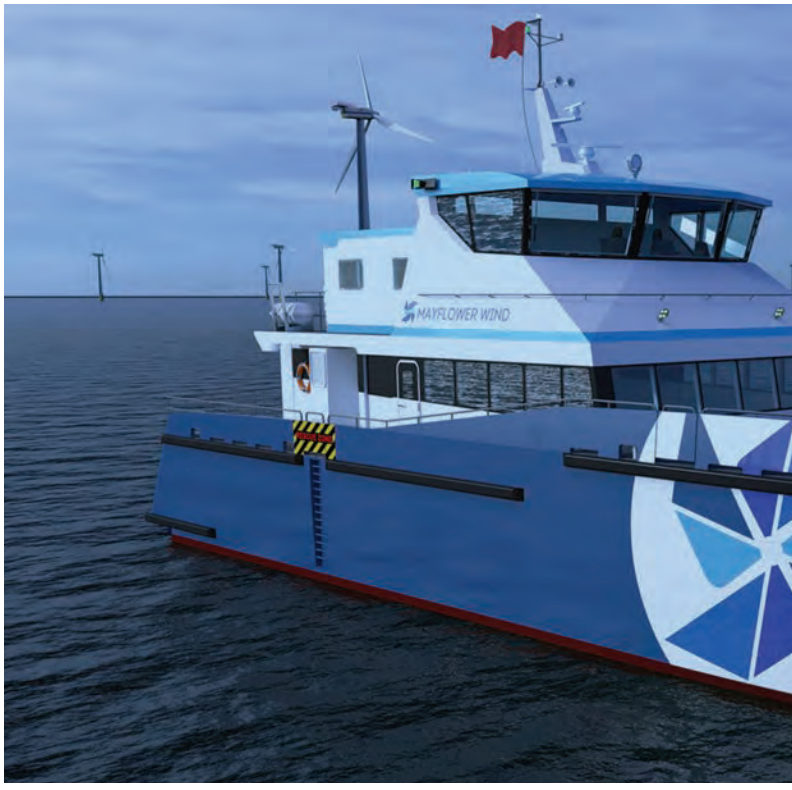
der construction at the **Keppel AmFELS** yard in Brownsville, Texas, to be deployed by Dominion Energy as it builds out CVOW, with components to be transported out from a revamped container terminal at Portsmouth, Va.

The WTIV, set for delivery in late 2023 (well in advance of work at CVOW), will be chartered to Ørsted-Eversource for installation work (based out of New London, Conn.) at two other projects in the Northeast, Revolution Wind and Sunrise Wind, expected to commence in late 2023 -2024. However, the feeder barge model (with non Jones Act WTIVs being supplied from U.S. hubs by compliant barges) may be dominating plans for future turbine installation. **Eneti**, a leading owner of internationally flagged WTIVs (and an advisor in the Charybdis project), had been unsuccessful in negotiations with U.S. yards in efforts to build another Jones Act compliant installation vessel. Vessel finance lawyers **Watson Farley Williams** highlight one important challenge in building WTIVs for the offshore trades. In a recent advisory, they note that "… As the sector evolves, while ideally shipowners and financiers would want to see long-term employment, we have not seen this so far and it raises the question as to how any financier can get comfortable with re-marketing risk on vessels…" In contrast, where vessel newbuild are tied to servicing offshore fields over multiple years, longer term contracts can support longer duration financings.

Recent announcements have seen U.S. maritime stalwarts teaming up with European partners, with decades of experience gained primarily in the North Sea, and crafting innovative approaches for building out and then servicing fields in U.S. waters.

The Vineyard Wind project, where ongoing survey work is being done from **Hornbeck Offshore's** HOS Mystique (working out of southern Massachusetts) will see an WTIV from **DEME** (a Belgian company) supplied from shore by **Foss Maritime** tugs and barges. Illustrative of the new solutions being brought to the sector, the U.S. office of DEME is bringing in **Barge Master** (Dutch, with market penetration in the oil patch), to incorporate motion compensation platforms on "smart" barges to be built by Foss. Foss, part of privately held **Saltchuk** is revitalizing a one-time oil products terminal in New Bedford, Mass, which will serve as a laydown area for components. Part of the funding will come from a U.S. Department of Transportation Port Infrastructure grant.

The Ørsted-Eversource partnership developing Revolution Wind and Sunrise Wind has hired the Dutch con-



Mayflower Wind

Ørsted

struction giant **Boskalis** to assist with transport, via U.S. tugs and barges, and installation (utilizing Jones Act compliant PSVs) of three offshore substations and the monopiles which will support turbines.

Equinor and **BP**, developing the Empire Wind project (in the New York Bight) turned to **Maersk Supply Service** in March 2022, ordering an WTIV to be built in Singapore at **Sembcorp Marine**. In July, 2022, Maersk said that it would be ordering a second WTIV, to serve the partners' Beacon Wind project (in waters near Nantucket). Maersk pegs the delivery date as 2025. The tugs and barges, to be **ABS**-classed, would be provided by an offshore wind division of **Kirby Corporation**, operating out of a terminal in Brooklyn, N.Y. (the South Brooklyn Marine Terminal, or SBMT, which- similar to the case in Virginia, had handled conventional cargo at one time). According to a Kirby announcement, "Kirby will be investing in two new ABS-classed feeder barge and diesel-electric hybrid tugboat units which will be constructed in U.S. shipyards for a total combined cost of between $80 million to $100 million. Each feeder barge will have the capacity to transport next-generation turbines of 15 MW and higher as turbine technology advances." Delivery of the diesel fueled tugs, with the capability to burn unspecified "alternative fuels", is set for late 2025/early 2026, according to Kirby.

Construction began in March 2022, on an **Edison Chouest** SOV, to be named Eco Edison, to be delivered in 2024 for work on the Eversource/Ørsted offshore wind farms in New England waters. Its diesel electric configuration will utilize **Voith** Schneider Propellers, powered by **Caterpillar** generators.

Empire Wind will also be seeing a Jones Act compliant SOV, to be chartered for ten years in a deal with Edison Chouest. Equinor (a partner with BP), in a release, said: "The plug-in hybrid vessel will be the first in the US capable of sailing on battery power for portions of the route. The SOV will sail into the port of SBMT on battery power, recharge the battery using shore power and sail out of New York Harbor."

Equinor and BP have chosen a partnership of **Great Lakes Dredge & Dock Corp.** (GLDD, with a Houston headquarters) and Netherlands-based **Van Oord** to perform the subsea rock installation work for the Empire Wind. Great Lakes has contracted the first Jones Act-compliant subsea rock installation vessel (with capability to run on biofuel, with auxiliary battery power). The vessel, priced at just under $200 million and currently under construction at the **Philly Shipyard**, will install rocks to protect and stabilize monopile foundations, electrical substructures and export cables, starting with the Empire Wind I array in the mid-2020s and then continue with Empire Wind II. Prior to the installation of foundations, Van Oord will mobilize its fallpipe vessel, Stornes, to install scour protection rock.

Smaller CTVs will be provide a stream of business for U.S. yards with a history of building aluminum passenger

vessels as well as crewboats for the oil patch. The Eversource/Ørsted windfarms will be served by crewboats built at **Senesco Marine** in Quonset Point, R.I. and **Blount Boats** in nearby Warren R.I. will build CTVs for a pair of vessel operators that have contracts the joint venture partners. Senesco (which built a vessel serving the offshore Virginia project) has lined up a deal with **WindServe Marine**, a company tied to coastal behemoth **Reinauer Transportation** (which owns Senesco) to build three 88-foot CTVs. **American Offshore Services**, with links to **Northern Offshore Services**, has contracted with **Blount Boats** (also a CTV veteran- having built a boat for A**tlantic Wind Transfers** serving Block Island Wind) to build two 100-foot CTVs. In a different version of European expertise coming to U.S. shores, **St. Johns Ship Building**, in Palatka, Fla. (recently purchased by **Americraft Marine**, a

Atlantic Wind Transfers

maritime subsidiary of the **Libra Group**, companies tied to the Logothetis family, a Greek shipping dynasty) has laid the keel on a CTV (based on an **Incat Crowther** catamaran design) that will be operated by **Windea**, where passenger ship operator **Hornblower** has partnered with **MidOcean Wind** (whose principals have experience in LNG barging and other innovative Jones Act projects).

The **Gladding Hearn** / Duclos yard, in southern Massachusetts has signed a deal with newcomer **Patriot Offshore Marine Service**, to build a CTV (also with Incat Crowther specs) which will serve Vineyard Wind. Waiting in the wings is Mayflower Wind, another project in Atlantic waters (south of Martha's Vineyard and Nantucket), being developed by **Shell Renewables** in conjunction with two European utilities. The developers, with an office in Fall River, are still working out details of a deal with Massachusetts. If everything falls into place, they are set to contract with Gladding Hearn / Duclos to build a hybrid battery diesel electric CTV.

As noted, finance for offshore wind differs from conventional shipping (where the mega-assets often see longer term charters). There are other contrasts as well; vessel propulsion almost always has a "clean" component (contrasted with heavy fuel consumption by scrubber-fitted vessels). Another difference from other maritime trades is the nature of power purchases tied to individual states; this frequently comes with "local content" provisions, which give rise to regional ports, in contrast to the major hubs seen in commercial shipping.

New leasing areas are also on the horizon. BOEM is soliciting comments regarding two sites in the Gulf of Mexico (one to the southeast of Galveston, and the other south of Lake Charles). In California, where deeper waters will require floating turbines, the agency is moving toward a lease

Great Lakes Dredge & Dock

auction on two areas- offshore Humboldt and Morro Bay, respectively. BOEM is also taking early steps in the deep waters of the Gulf of Maine, where it has issued a "Request for Interest" (RFI), the first step towards eventual leasing.

Clearly the winds are blowing in the right direction for what will become a vibrant U.S. maritime sector. The law firm **Vinson & Elkins**, in a commentary on the Inflation Reduction Act (signed into law in mid-August 2022), noted, "Several provisions related to offshore wind and related transmission infrastructure stand out, and the incentives they provide may succeed in spurring necessary infrastructure development." The legislation includes provisions to provide tax incentives to developers of offshore wind facilities (with vessels serving such facilities considered to be "offshore wind components"). Other sections of the bill include funding for cables linking offshore turbines to the landside electrical grid.

Atlantic Wind Transfers

OWNERS & OPERATORS

Atlantic Wind Transfers

Callan Marine

Callan Marine

Atlantic Wind Transfers

Atlantic Wind Transfers, led by Charles A. Donadio, Jr., is an American leader—quite literally. In 2016, it became the first crew transfer vessel owner and operator in the U.S. with the launch of Atlantic Pioneer, the country's first purpose-built vessel for offshore wind. Today, the company owns and operates two CTVs, serving the Block Island and Coastal Virginia Offshore wind farms on long-term charters, and the firm is well-positioned to capitalize on the enormous opportunities presented by an industry that is only just starting to take off.

In August, it was announced that AWT's plans and fleet were set to expand, with news that the Rhode Island-based company had ordered an additional six CTVs from Florida builder St. Johns Ship Building. These vessels will operate up and down the East Coast as the U.S.'s still new offshore wind industry continues to build up in the years ahead.

Callan Marine

Galveston-based Callan Marine possesses one of the youngest, most powerful dredge fleets in America. "Our oldest dredge is 11 years old, so we have a nice modern, new fleet, which really helps us in our performance," said the company's president, Maxie McGuire. "I'm very proud that we have one of the newest fleets in the industry."

McGuire and Callan Marine have plenty to be proud of. McGuire, a U.S. Air Force veteran with an Operation Desert Storm tour under his belt, took a job with the U.S. Army Corps of Engineers after discharge before eventually finding his way into the private sector. In his current role as Callan Marine president, he's helped the family-owned dredging and marine construction contractor prosper, growing from 14 employees a decade ago to 250 today—many of them "hand-picked".

"All of our staff comes from seasoned positions, and about 75% of our management team, we've worked together somewhere along the line in my career. Behind the walls here where we are family-oriented, we are people-centric and that makes chasing the vision that much easier."

Today, Callan operates four cutter suction dredges, including the recently launched 28-inch General Bradley, with two more newbuild CSDs—the 18-inch General Marshall and 32-inch General Arnold—and a trailing suction hopper dredge Admiral Nimitz on the way. "We also have a host of support equipment, tugboats, barges and the like under construction to support the dredges," McGuire said.

Cape May Lewes Ferry

Launched in 1964, the Cape May-Lewes Ferry operates 365 days a year, connecting Cape May, N.J., with Lewes, Del., with a minimum of eight crossings per day. Each year, the ferries carry 800,000 passengers and close to 300,000 vehicles across the 17 miles of the Delaware Bay. It currently operates three 350ft vessels: Cape Henlopen, Delaware and New Jersey. Uniquely, all three of the company's permanent captains are female.

"We at the Cape May Lewes Ferry like to consider ourselves the greatest ferry service in America," said Jennifer Shivers, Assistant Director of Ferry Operations. "We are not only a way for guests to get to and from their destination but we think we provide an experience."

There's something to like for all passengers, whether it's those travelling for work, business, vacation, shopping, snowbirds or folks just passing through the Eastern Shore. "On board we give out first time sailor certificates, captain and boat cards as well as wildlife cards of all of the different animals you can see during your crossing which includes dolphins, whales, ospreys and seals. During the peak season we provide onboard entertainment as well as trolley shuttle service into the local resort towns."

Cape May Lewes Ferry

OWNERS & OPERATORS

Crowley

Crowley

Harvey Gulf International Marine

Harvey Gulf International Marine

Crowley

Anyone reading up on some of the latest trends in the U.S. maritime industry—decarbonization, alternative fuels and electrification, autonomous vessels, offshore wind, etc.—will surely come across the name of one of the nation's largest and highly regarded shipping and logistics companies: Crowley Maritime Corporation. The 130-year-old company is helping to drive change within the industry as it aims to become the most sustainable and innovative maritime and logistics company in the Americas.

As part of this ambitious goal, Crowley recently announced its aim to achieve net-zero emissions by 2050. Other priority areas for the company include adopting low- to zero-carbon fuels and supporting new energy development; increasing talent diversity, growth and retention; and supporting people and communities. Among recent highlights, Crowley is working to advanceme alternative power technology and vessels such as the fully electric, battery-powered tugboat eWolf — the first of its kind in the U.S. — and a public-private partnership to develop an offshore wind services terminal in Salem, Mass.

"The needs of our planet and people are changing, and alongside our partners, we are working each day with customers to reduce the environmental footprint of their supply chain utilizing ocean transport, which continues to be the greenest way to transport goods," Tom Crowley, Crowley's chairman and CEO, said when the company released its sustainability report earlier this year. "We are proud of our accomplishments and initiatives . . . Our commitments are deliberately ambitious, and we are establishing partnerships and standards to ensure success – matching our commitments with measurable action and year-over-year progress."

Harvey Gulf International Marine

Harvey Gulf International Marine, founded in 1949, is a privately owned and operated marine transportation company that specializes in providing fast supply vessels, offshore supply and multipurpose support vessels for deepwater operations.

As a leader in the supply boat industry supporting U.S. oil oroduction, Harvey Gulf has always strove to set the standards for finding ways to improve the U.S. economy by performing with top efficiency, while exceeding safety expectations. "We have risen to every challenge to show not only the industry fore-front but to succeed even in challenging times," the company said in its MN100 application. "Our leadership has navigated economical changes, a pandemic and numerous literal storms, always finding ways to succeed despite, and even often because of, the way we have encountered these opportunities."

Harvey Gulf is well known for its strides in alternative fuels, batteries and vessel emissions reduction. Asked about the business case for "going green" and why doing so is important and beneficial to Harvey Gulf, Shane Guidry, Chairman of the Board and CEO, Harvey Gulf, said, "Back in 2011, we saw this as the future of our business as we planned ahead for drastic emissions standard changes due to occur in 2016 and 2020. We wanted to build for the future."

The Interlake Steamship Company

The Interlake Steamship Company

The Interlake Steamship Company is one of the biggest names in Great Lakes shipping. And while the privately held, family-owned company has roots that go back over 100 years, it also has its sights set on the future. This year, the Ohio-based company launched the Mark W. Barker, the first newbuild Jones Act laker in nearly four decades.

"This is truly a historic celebration for our company and for the United States maritime industry as we proudly christen the newest vessel to join the U.S. flag fleet on the Great Lakes and our first new build in 41 years," Mark W. Barker, President of The Interlake Steamship Company and the vessel's namesake, said during the vessel's christening ceremony. "While this ship may bear my name, it is a testament to the innovation, skill and grit of our employees who have powered our industry and propelled our company for more than 130 years."

Built by Fincantieri Bay Shipbuilding in Wisconsin, the vessel measures 639 feet in length, 78 feet in beam, 45 feet in molded depth and 28,000 dead weight tons. It will transport raw materials such as salt, iron ore and stone to support manufacturing throughout the Great Lakes region. The ship will also be capable of transporting specialty cargoes such as steel coils and windmill towers and blades.

Maritime Partners

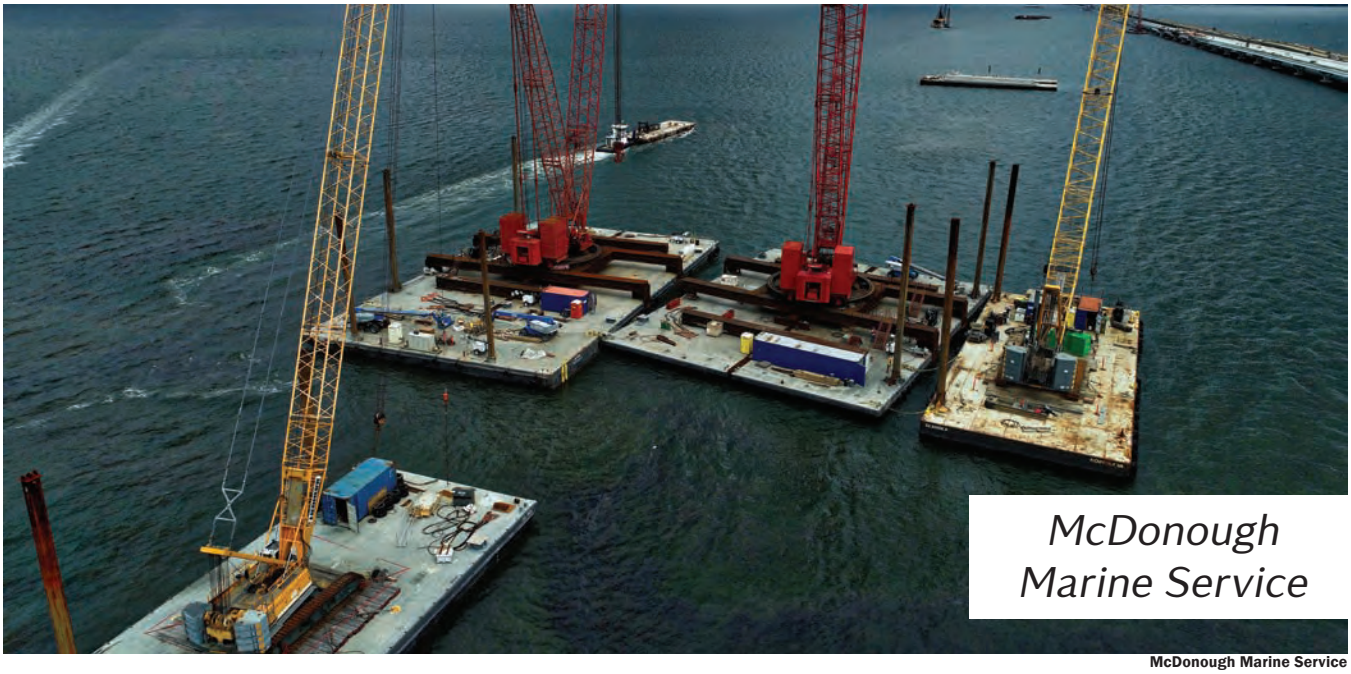
Louisiana-based Maritime Partners, LLC is a privately held company leading the way in maritime assets, vessel leasing solutions and construction financing in the United States. With a fleet of more than 1,600 vessels—including a broad range of push boats, tugs, barges dredges and other assets, and with an estimated fair market value of $1.2 billion—Maritime Partners is the nation's largest lessor of marine vessels and equipment, working with some of the biggest names in the business. Its assets transport the commodities that comprise the building blocks of the domestic economy, including agricultural products, chemicals, aggregates, crude oil and refined petroleum products.

Among recent growth highlights, Maritime Partners at the end of 2021 acquired the portfolio of J. Russell Flowers, Inc., and this summer it agreed to acquire M/G Transport Holdings LLC.

The company is also working to develop the innovative Hydrogen One towboat, the first of its kind globally to run on emissions-reducing methanol-to-hydrogen generator technology—no diesel propulsion on board—as the maritime industry continues to plot its course toward cleaner vessel operations. The groundbreaking vessel was designed by Seattle-based Elliott Bay Design Group and will be built at Intracoastal Iron Works in

Elliott Bay Design Group

Maritime Partners



McDonough Marine Service

McDonough Marine Service

Bourg, La. Other key partners in the project include technology providers e1 Marine, based in Bend, Ore., and multinational ABB. Once completed, the vessel will be operated by Jeffersonville, Ind.-headquartered marine transportation company American Commercial Barge Line, likely to move petroleum products in and around Louisiana and Texas.

McDonough Marine Service

In business for more than three quarters of a century, McDonough Marine Service is one of the largest charterers of deck barges in the United States, having supported countless maritime civil construction and offshore oilfield construction projects. Working in several markets to service civil construction, project cargo, oil and gas and general transportation, McDonough Marine Service is a 77-year-old leader in the marine transportation and logistics industry. As a complete solution provider, the company specializes in the charter of barges and tugs, and the coordination and management of cargo moves to support the successful execution of its customers' projects. Its fleet of deck and spud barges range from a 400'x100' oceangoing deck barge all the way down to a 35'x12' work float. The company operates three major fleeting locations out of Belle Chasse, La.; Channelview, Texas; and Chesapeake, Va. These fleets are able to offer minor shipyard services including barge repair as well as prepping and cleaning. McDonough also operates 14 other fleeting locations including St. Louis, Mo.; Parkersburg, W. Va.; Chicago, Ill.; Staten Island, N.Y.; Charleston, S.C.; Savanah, Ga.; Jacksonville, Fla.; Port Manatee, Fla.; and several in Louisiana.

All American Marine

All American Marine

All American Marine

All American Marine got its start more than 30 years ago specializing in the construction of aluminum fishing vessels used from California to Alaska. But the Pacific Northwest boatbuilder adapted to changing markets in the '90s, and today it is a builder of custom-tailored aluminum high-speed passenger boats, hybrid vessels, dinner cruise boats, patrol and research vessels. In 2017, AAM relocated to a new state-of-the-art facility in Bellingham, Wash., where all of its vessels are built in a 57,000 sq. ft. production facility adjacent to Bellingham Bay. The production shop contains seven overhead bridge cranes, a brake press, shear, CNC router cutter and a laser-leveled construction platform.

AAM has exclusive North American building rights with one of the world's top naval architects and designers, Nic de Waal of Teknicraft Design, in Auckland, New Zealand. The unique Teknicraft design incorporates the use of a cutting-edge hull shape and an optional hydrofoil system in catamarans to create lift and enhance vessel performance. Unique design characteristics ensure high-speed travel, ultra-low wake, industry-leading fuel efficiency, and all fully customizable depending on the application.

Recent deliveries from AAM include Swiftsure high-speed catamaran ferry for Puget Sound Express, Skana and Spirit of Matushka tour boats for Major Marine Tours and Storm Petrel research vessel for NOAA. Notably, AAM last year launched Sea Change, a zero-emissions, hydrogen fuel cell-powered ferry that will operate in the California Bay Area. It is the first hydrogen fuel cell vessel in the U.S. AAM is currently building a 73' Windfarm Support Survey Vessel for Geodynamics, 50' Tour Vessel for Iruka Hawaii and a 65' research vessel for the University of Hawaii.

Austal USA

This summer, Mobile, Ala. shipbuilder Austal USA emerged as having won a contract to build up to 11 medium-endurance Offshore Patrol Cutters (OPC) for the U.S. Coast Guard. The competition was fierce, with a number of the country's top yards bidding for the significant program. The initial $208.26 million award supports detail design

Austal USA

and long lead-time material for one Heritage class OPC, with options for production of up to 10 additional vessels, the Coast Guard announced in June. The deal could be worth up to $3.33 billion if all options are exercised.

Austal USA, which has built and continues to build a number of aluminum vessel classes for the U.S. Navy, recently opened a new $100 million facility that gives it steel shipbuilding capabilities as it geared up to bid for the OPC build program—which it expects to start in 2023. In July, Austal USA began building its first steel vessel, a Navajo Class Towing, Salvage, and Rescue Ship (T-ATS 11) for the U.S. Navy.

"The United States Coast Guard's new Offshore Patrol Cutters are an outstanding opportunity for Austal USA to further demonstrate the shipyard's new steel shipbuilding capability; based on years of proven construction experience through the delivery of the LCS and EPF programs for the United States Navy," Paddy Gregg, CEO of Austal USA's Australian parent company Austal Limited, said at the time of the OPC award.

Austal USA president Rusty Murdaugh said, "This contract award is the result of our continued investment in our people and our facilities. We are thrilled for the opportunities this will bring to our local community and our tremendous supplier base, as this program will provide our shipbuilding team the stability for continued growth."

"The Coast Guard's decision to select Austal USA to build its second round of Offshore Patrol Cutters highlights the world-class workforce and proven track record of the Mobile shipyard," said U.S. Senator Richard Shelby (R-Ala.). "This contract speaks to the reliability and strength of Austal employees along the Gulf Coast, as well as their ability to deliver. This is excellent news for the future of our Coast Guard and for shipbuilding in Alabama. I look forward to the positive impact that Austal and Mobile have on the security of our nation."

Conrad Shipyard

Conrad Industries, Inc., established in 1948 and headquartered in Morgan City, La., designs, builds and overhauls tugboats, ferries, liftboats, barges, offshore supply vessels and other steel and aluminum products for both the commercial and government markets. The company provides both repair and new construction services at its five modern and expansive shipyards located in southern Louisiana and Texas.

Conrad Shipyard

Eastern Shipbuilding Group

Eastern Shipbuilding Group

One of the most diverse and capable shipyards in the country, Conrad is also among the nation's most respected, celebrating its 75th year in business in 2023. With an experienced workforce and computerized manufacturing equipment; multi-disciplined engineers; and a management team focused on customer satisfaction, Conrad Shipyard is well positioned to provide cost-effective solutions to complex shipbuilding challenges. The company's portfolio includes a wide range of vessels built for commercial customers and for the U.S. government, having delivered more than 1,100 vessels and fabrication products to date.

Conrad was recently named the winner of a $19 million contract for the detail design and construction of a new Yard, Repair, Berthing, and Messing (YRBM) craft for the U.S. Navy. The $18,988,990 contract is for one YRBM barge, but includes options for up to eight, which, if exercised, would bring the cumulative value of this contract to $142,906,420. Work for the initial award will be performed in Amelia, La., and is expected to be completed by November 2023. If all options are exercised, work will continue through December 2025.

Conrad Shipyard has a long history of innovation and has developed many practical answers to complex shipbuilding challenges. One such challenge was in refitting NASA's Pegasus barge used to transport the core stage of the new Space Launch System rocket.

Eastern Shipbuilding Group

Headquartered in Bay County, Fla., Eastern Shipbuilding Group has built a portfolio of more than 350 vessels for national defense and commercial purposes over the span of more than 45 years. Today, the company manages complex government shipbuilding projects as well as commercial projects from three state of the art facilities for new construction and repair projects on the Florida Gulf Coast.

Eastern recently built the latest fleet of iconic Staten Island Ferries and the shipbuilder also serves the commercial dredge markets, having recently launched a second hopper dredge vessel for Weeks Marine. Eastern has also recently contracted to construct a new 300-foot ferry for McAllister Towing and Transportation. On the government side, ESG serves as the prime contractor for the U.S. Coast Guard's highest acquisition priority, the Heritage Class Offshore Patrol Cutter program. To date, Eastern has earned the award of construction for OPCs 1 through 4.

Eastern has completed of a new, state-of-the-art aluminum superstructure fabrication and assembly hall at its Nelson Street Shipyard. The company has also embarked on a $50 million, 15,000 ton drydock project at its Port St. Joe facility in order to provide full vessel sustainment services.

With 1,500 employees, Eastern is a substantial presence in the Gulf Coast communities, and the company said it is gearing up to hire almost 300 new employees to fill 70 corporate positions and 226 craft positions.

U.S. Navy

Fincantieri Marine Group

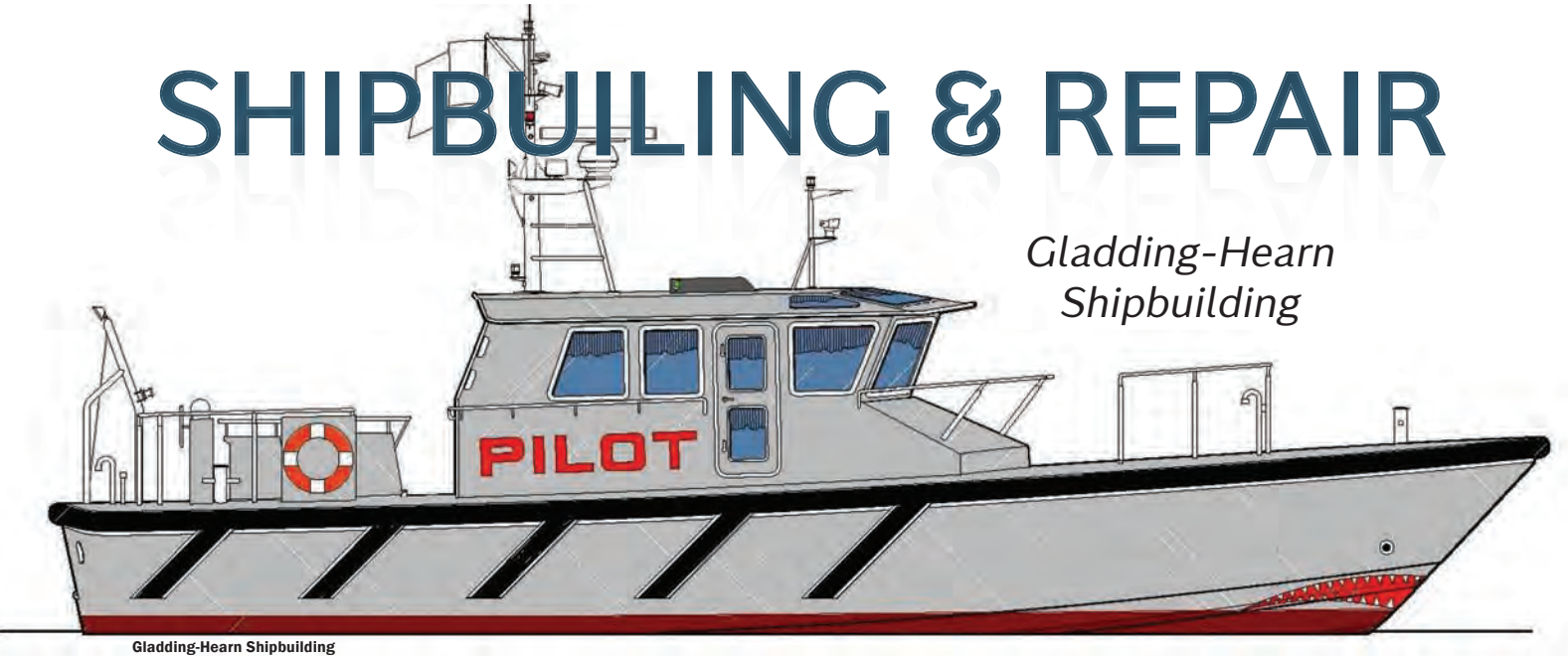
Fincantieri Marine Group, comprising three Wisconsin shipyards (Fincantieri Bay Shipbuilding in Sturgeon Bay, Fincantieri Marinette Marine in Marinette, and Fincantieri ACE Marine in Green Bay), builds and services a range of vessel types for commercial and government customers.

Fincantieri Bay Shipbuilding is a specialist in the construction, repair and conversion of Coast Guard and commercial vessels including Great Lakes freighters and ATBs. FBS is building the two largest LNG bunker barges ever built in the United States and recently delivered The Interlake Steamship Company's Mark W. Barker, the first new Jones Act laker in nearly 40 years. In September, FBS broke ground on a new 19,000 sq. ft. machine shop.

Considered a center of excellence for small surface combatants, Fincantieri Marinette Marine is building the U.S. Navy's future guided-missile frigate, as well as the Freedom-class Littoral Combat Ships. FMM announced in August that it has officially started construction on the U.S. Navy's first Constellation-class guided missile frigate. The yard has been selected to build a class of up to 10 multimission guided-missile frigates, and the program could be worth $5.5 billion if all options are exercised.

Fincantieri ACE Marine, is an aluminum construction facility that builds the U.S. Coast Guard's medium-sized Response Boats. It also designs and constructs high-speed coastal intercept and patrol vessels.

SHIPBUILING & REPAIR



Gladding-Hearn Shipbuilding

Gladding-Hearn Shipbuilding

For almost 65 years, Gladding-Hearn Shipbuilding has built steel and aluminum commercial vessels operating in the U.S. and foreign countries. Located on seven acres along the deepwater Taunton River in Somerset, Mass., the family-owned and operated shipyard is currently under the leadership of co-presidents Peter Duclos and John Duclos. Nearly all of the several hundred vessels built by the shipyard are still operating today, and some 90% of Gladding-Hearn's business is from repeat customers.

With in-house naval architecture and engineering capabilities and a cross-trained workforce, Gladding-Hearn is well-known for applying some of the most advanced shipbuilding techniques that rival many bigger yards, while still providing the personal customer service of a smaller yard.

The builder's primary products include pilot boats, high-speed passenger catamarans and mono-hull ferries, tugs, patrol and rescue boats, crew transfer vessels and research vessels. Since 1955, Gladding-Hearn has been synonymous with pilot boats, having built more launches than any other shipyard. In 1978, the yard joined forces with designer C. Raymond Hunt to build the first launch with a deep-V hull, soon to become the industry standard. In 2014, the shipyard built the first pilot boat application of Volvo Penta's IPS drives in the United States. Having built over 200 tugs, barges and bridge tenders, the shipyard delivered America's first Z-drive tractor tug in 1977. An Incat Crowther licensee since 1987, Gladding-Hearn became the second shipyard in the country to build high-speed passenger catamarans and has built the majority of fast ferries on the East Coast and Great Lakes. The builder has also recently won its first CTV orders for the growing U.S. offshore wind industry, including one for Mayflower Wind, as well as another for Patriot Offshore Maritime Services that will be operated for Vineyard Wind.

Lake Assault Boats

Lake Assault Boats offers a wide range of custom hull designs and configurations suitable for use on inland lakes and rivers, and inter-coastal and offshore waters, to meet the needs of first responders. The company's craft are built to exceed USCG, ABYC, and ISO based design standards. The boat manufacturer says it offers custom hull designs to fit any department's primary mission, which is particularly important as today's patrol, fire, and emergency response craft are constantly evolving. Equipment technology is advancing quickly, and it's important to keep up with new technologies. The fire pumps are more powerful and flexible. There are stronger and more efficient propulsion engines available from a wide range of manufacturers. In the past five years, Lake Assault Boats has invested approximately $10 million in new equipment, including a new high-definition cutting table, new dock facing, and upgrades to electrical infrastructure.

Lake Assault Boats

Marine Group Boat Works

Southern California shipyard Marine Group Boat Works (MGBW) has mastered the art of balancing yacht, commercial and government vessel repair work, with a bit of newbuild activity as well. Over the past three years or so, MGBW's workload has been about 60% yachts and the remaining 40% a mix of commercial and government vessel projects. From both an operational and business point of view, chasing multiple markets certainly presents a number of challenges. But on the other hand, this model also provides more opportunity as diversification can help a yard stay busy through market dips and cycles. "That's always been our mantra," said MGBW president Todd Roberts. "We call ourselves a three-legged stool, and years ago we added a fourth leg. Our yacht business is one leg of the stool, commercial is another leg, navy repair is another and new construction is the fourth. It's really hard to fall over when you have four legs."

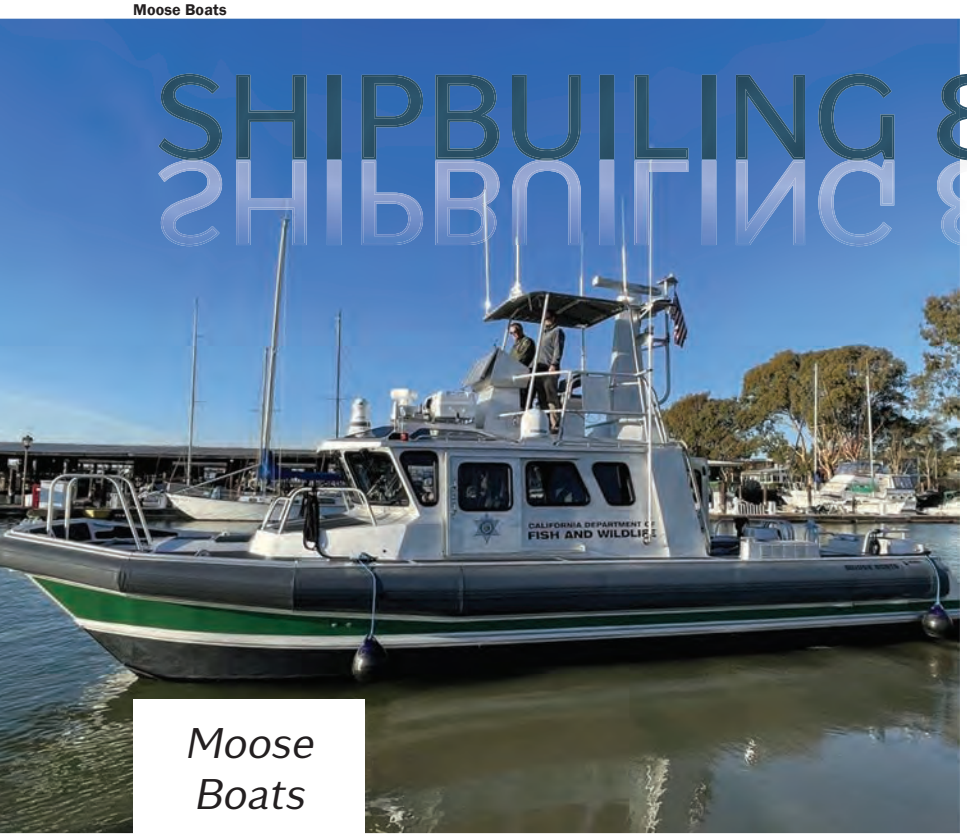
MGBW recently completed a fairly large $4.6 million program for Golden Gate Ferry to service and repair four high speed, aluminum passenger ferries, with more work for the same customer presently underway. Roberts said MGBW recently did some work for Edison Chouest Offshore where it as able to haul a series of tractor tugs in a row to get them through their credit dry dock process. Roberts also mentioned two large tug projects for Crowley, including one that saw MGBW repaint the vessel from red to Crowley's new blue. And with new stricter emissions rules coming down the line for harbor craft in California, MGBW is about to get a whole lot busier amid a sharp demand increase for repower and even new construction projects.

Marine Group Boat Works

MGBW's new construction work is primarily for the U.S. Navy, and it is currently building two high-speed patrol boats that the U.S. will transfer to Jordan.

Moose Boats

SHIPBUILING & REPAIR



Moose Boats

RIBCRAFT

Moose Boats

Vessels built by Moose Boats are considered to be among the finest aluminum military, law enforcement and firefighting vessels in the industry. As a semi-custom vessel builder, Moose Boats builds rugged aluminum catamarans and monohulls designed to meet a variety of mission specific applications for law enforcement, emergency response, and security patrol purposes; the Vallejo, Calif. boatbuilder's clientele includes U.S. Navy and several high-profile law enforcement and firefighting agencies throughout the country.

Notable recent builds include a 75-foot CTV catamaran for Westar Marine, a 46-foot M1 catamaran for the California Department of Fish & Wildlife, and 35-foot M3 patrol vessel for the Santa Cruz Harbor Patrol.

RIBCRAFT

Marblehead, Mass. based RIBCRAFT is the only boat builder specializing exclusively in building professional grade rigid inflatable boats (RIBs). Serving all commercial markets; from military agencies and state and local governments to safety professionals, private industry and non-profits, RIBCRAFT vessels are available from 15 feet to 41 feet, and built to order in the United States.

RIBCRAFT has delivered thousands, specializing in building mission specific patrol and rescue boats, tactical and special operations, support and workboat vessels, dive boats, and USCG Certified passenger for hire vessels. RIBCRAFT designs and builds RIBs to meet the emergent requirements of military and government agencies. RIBCRAFT has delivered the first boats of up to 278 7-meter RIBS as part of a five-year IDIQ contract worth up to $78 million. These 24' RIBs serve as the Ready Service Life Boats on all Navy ships. RIBCRAFT is also actively building the 11-meter Expeditionary RIBs for the U.S. Navy. Having recently exercised another option year worth an additional $9.7 million dollars, the Navy is on track to order up to 45 of these 11M RIBs of a five-year IDIQ contract worth over $40 million dollars. These 39' RIBs serve to support explosive ordinance disposal mine counter measure platoons in both shallow and deepwater operations. RIBCRAFT remains dedicated to building rescue and patrol boats for first responders with recent deliveries and awards for departments all over the country.

RIBCRAFT

SAFE Boats International

Founded in 1996, SAFE Boats International designs and builds reliable and durable vessels that help keep military, law enforcement and first responders safe as they carry out their duties, protect citizens and work to save lives. Headquartered just outside Seattle, in the city of Bremerton, Wash., SAFE Boats is 100% American owned and operated. The company was named for its pioneering wrap-around collar design: Secure Around Flotation Equipped.

SAFE Boats builds vessels to suit marine firefighting, law enforcement, search and rescue, military as well as private and commercial users. Its portfolio consists of 23' up to 35' center console/T-tops; 25' to 38' full cabin, outboard driven boats; 27' to

SAFE Boats International

SAFE Boats International

31' walk-around cabins; 31' full cabin EMT and 27' walk-around towboat variants; 36' to 65' full cabin, inboard jet boats; and all the way up to 39' riverine patrol boat and the 85' Mk VI patrol boat. In addition to its "standard" cadre of SAFE Boats, the builder has established partnerships with Stormer Marine (based in the Netherlands) to build their workboat designs in the U.S. and Diverse Marine Ltd. (based in England) to build crew transfer vessels and daughter craft in support of offshore wind applications in the U.S.

In October of 2021 SAFE Boats announced it had been awarded an $89,717,984 firm-fixed-price modification to a previously awarded contract for design, construction, outfitting, reactivation and training for six Mk VI Patrol Boats with an option for two more. This contract will provide Mk VI Patrol Boats to Ukraine via a U.S. State Department-approved agreement. Final delivery on the contract is slated for March 2025, or March 2026 if the option is exercised.

Silverback Marine

Tacoma, Wash.-based Silverback Marine is a relatively new name in boatbuilding, formed with the tall ambition to "change the way the world thinks about workboats".

"We started Silverback with the vision of essentially bringing, what I would call, the big boat experience to smaller workboats. Enabling people to get a smaller workboat, but also have a real naval architect and engineer go through it—give them renderings, give them that tailored experience that you would normally only find if you're getting a much larger vessel," the company's founder, Ian Gracey, said.

Silverback Marine is among a number of U.S. builders aiming to accelerate delivery times by keeping an inventory of stock vessels—which is especially beneficial given the current supply chain issues that are plaguing newbuild projects.

Silverback's customers range from ports and municipalities to oil response and tug and barge companies, "anyone who's in the market for a workboat between 21 and 60 feet," Gracey said. The company is now in its third year of business, and to date, it has built 51 vessels with four builds currently underway.

Silver Ships

Founded in 1985, Silver Ships is a family-owned premier builder of high-quality, cutting-edge aluminum workboats from 21 feet to 70 feet in length, used for fire rescue, law enforcement, military operations, marine surveying and other mission-specific applications. Its vessels are based

Silver Ships

Silver Ships

on existing design types but are uniquely customized and outfitted for the needs of individual customers in the U.S. and overseas. An on-site accredited naval architects and engineering staff designs all boats within a three-dimensional modeling and hydrodynamic design software to ensure safety and operational usage in design, development, design evaluation and calculation throughout all stages of construction. From the initial design to the final send-off, every step of the boat building process is completed at Silver Ships' headquarters in Theodore, Ala. It also offers boat repairs and comprehensive refurbishment services for all makes and models of aluminum workboats.

Silver Ships was awarded an $8.2 million delivery order as a result of being awarded a firm-fixed price IDIQ single award contract by the Naval Sea Systems Command for the construction and delivery of up to 11 Naval Special Warfare (NSW) Surface Support Craft (SSC) and U.S. Coast Guard Special Purpose Craft, Law Enforcement (SPC-LE) vessels. The contract includes options that, if exercised, would bring the cumulative value of the contract to $51.6 million. Silver Ships has constructed more than 650 Rigid Hull Inflatable Boats (RHIBs) for all branches of the U.S. Military. The new project entails the construction of five different vessel variants, all AMBAR series RHIBs.

Silverback Marine

Elliott Bay Design Group

Boksa Marine Design

NAVAL ARCHITECTURE

Boksa Marine Design

Boksa Marine Design

Boksa Marine Design (BMD) is a naval architecture and marine design firm located just outside of Tampa, in Lithia, Fla. Founded by naval architect and marine engineer, Nicholas Boksa, P.E., Boksa Marine Design's engineers have actually worked on ships at sea and have a wide array of expertise and practical experience building in steel, aluminum and composite. "Every Boksa boat is a rugged vessel with exceptional seakeeping capabilities. Since our naval architects and marine engineers are working sailors who kicked steel onboard, every design is engineered like a ship we'd actually take to sea," Boksa said.

Boksa boats are designed, engineered and built to exceed the operational requirements of their unique mission. The firm provides production engineering, systems engineering and complete refit engineering for the commercial marine industry, including workboat, inland river and shallow draft market

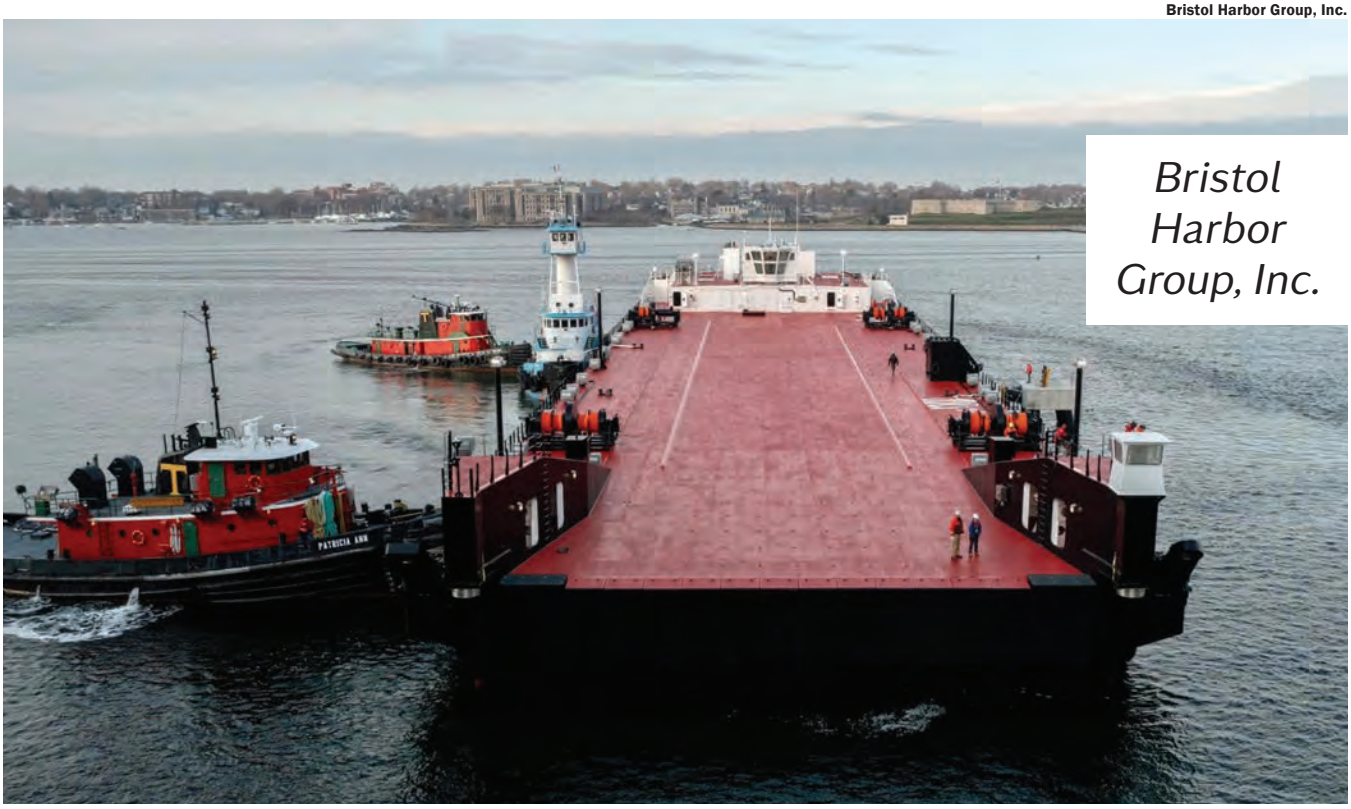
BMD completed 720 naval architecture projects up to 740 feet for 65 clients since 2003, demonstrating high versatility between commercial, military, government, law enforcement, inland waterways and passenger vessels. Projects run the gamut from crane barges to survey and patrol boats for Workskiff & North River Boats, and production engineering projects for Conrad Shipyard, Blount Boats, St. Johns Ship Building, VanEnkevort Tug & Barge and Overseas Shipholding Group. BMD recently provided complete design and engineering for DonJon's 78' tug J. Arnold Witte, it firm completed ship repair and refit engineering jobs for International Ship Repair, and it assisted with Subchapter T regulatory compliance for Corinthian Catamarans and Cooper Marine.

Bristol Harbor Group, Inc.

Among the U.S.' leading naval architecture firms, Bristol Harbor Group, Inc. is a full-service naval architecture, marine engineering and consulting firm located on the harbor in Bristol, R.I. The company has been in business for more than 25 years, having produced numerous designs, to which hundreds of vessels have been built. BHGI specializes in commercial vessel design and consulting and have experience with tugs, barges, ATBs, passenger vessels, workboats, dredges and floating dry docks.

BHGI utilizes state of the art computer modeling and design tools. Some of the naval architecture services provided include structural analysis, finite element analysis, deadweight surveys, hydrodynamic analyses utilizing computational fluid dynamics and hydrostatic analysis. BHGI

Bristol Harbor Group, Inc.



Bristol Harbor Group, Inc.

also offers a range of marine engineering services. Its engineers focus on the design of new vessels, repowerings, and mechanical and electrical upgrades to existing vessels, as well as crane specification and integration, piping design, fuel system design, main engine specification and electrical load analysis. In addition to designing vessels, BHGI provides technical support and consulting services to vessel owners, charterers, and operators. These services can be in support of a new construction project, modifications, regularly scheduled dry docks or more comprehensive maintenance periods. BHGI offers a full spectrum of services from concept design through shipyard selection and construction oversight. This can include detail design, implementation of tests and trials, and eventual lifecycle management and maintenance support.

BHGI is currently working on exciting projects involving advanced fuels, advanced hull forms and hybrid-diesel-electric propulsion, and the firm is currently working on many projects such as a high-speed foil assisted catamaran, multiple deck, crane, and liquid cargo barges, and multiple projects for the defense industry. The firm was recently awarded a five-year Indefinite Delivery Indefinite Quantity Contract (IDIQ) with the U.S. Army Corps of Engineers, Marine Design Center. BHGI designed a 618'x140' floating dry dock for General Dynamics Electric Boat to support the construction and maintenance of the new Columbia Class ballistic missile submarines and Virginia Class fast attack submarines. BHGI recently completed the contract design of a twin screw inland tug for operation on the New York State Canal System.

DLBA Naval Architects

DLBA, a division of Gibbs & Cox, Inc., is a naval architecture and marine engineering providing consulting services for the design and construction management of motor yachts, fiberglass recreational boats, and aluminum workboats. The firm specializes in high-performance marine craft design and engineering, yet supports all types of vessels and clients from record-setting high-speed race boats to commercial marine tugs and barges.

Like many companies in the U.S. maritime realm, DLBA sees opportunities within the growinh U.S. offshore wind market. "With talks about needing 300-400 crew transfer vessels (CTV) to support U.S. wind farms over the next 10-15 years, that's a lot of boats," said DLBA director Jeff Bowles. "Our team is trying to break the CTV paradigm for the boat and operational tempo. Our operational landscape is different from the North Sea, and what

DLBA Naval Architects

Jeffrey Bowles
DLBA Naval Architects

is great there may not be the best for us. We are working on a monohull design that meets or exceeds the performance parameters that wind farm developers are looking for, but at the same time has a lower total ownership cost."

Bowles said the firm recently supported OceanAero with its Triton platform, a sail- and solar-powered, autonomous unmanned surface vessel (USV). "Our effort focused on modifying the wingsail geometry to improve sailing performance. Our DLBA team collaborated with our new counterparts at Leidos to create a computerized routine to refine the geometry and evaluated the results using computational fluid dynamics (CFD). We achieved great results on paper and the new geometry test article is under fabrication, with testing scheduled for later this year. I'm proud of this project because working with sail powered vessels is new for DLBA, and we were able to collaborate with new teammates, both internal and external. It's relationships that lead to success, and it looks like this team's initial effort will be a success."

Elliott Bay Design Group

Elliott Bay Design Group (EBDG), in business for 34 years, is a full-service, employee-owned naval architecture and marine engineering firm regarded as a national leader in innovative vessel design and offering extensive engineering and production support for the marine industry. EBDG has brick and mortar offices in Seattle and Covington, La., with supporting employees working remotely from across the U.S., from New York to California and South Carolina to Alaska.

As the worldwide imperative for cleaner, greener vessels has increased in urgency, EBDG and its staff of 50+ are at the leading edge of that effort, with designs that incorporate all forms of fuel-efficient hybrid power and alternative propulsion options. The firm is actively involved in the design of several emission-reducing vessels and are supporting clients across the industry as they consider alternative fuel options for their fleets.

EBDG developed the functional design for the WSF Hybrid Electric Olympic Class vessels, and it is supporting WSF with electrical engineering expertise for modifications to the JMII ferries, which will be the largest hybrid electric vessels in the U.S. In addition, three of the firm's hybrid-electric passenger/vehicle ferry designs are entering construction for Casco Bay Lines, Louisiana DOTD and The Trust for Governors Island, and it is beginning the design of a new all-electric ferry for WETA. EBDG developed a concept for a large high-speed catamaran ferry with hydrogen fuel cell propulsion and designed the first IMO

Elliott Bay Design Group

2030 compliant vessel with methanol reformer and hydrogen fuel cell technology, to be delivered in 2023.

Gilbert Associates Inc

Gilbert Associates is a naval architecture and marine engineering firm, originally founded in 1964 by John W. Gilbert, Sr. whose legacy continues on under the leadership of John W. Gilbert, Jr. Its vessel design portfolio includes passenger vessels, tow boats, tugs, barges, research vessels and other workboats, and the firm is also well known for consulting services, including speed and power analysis, stability analysis, mid-life refurbishments and vessel lengthenings. "The strengths we bring to our new designs are enhanced by the knowledge and experiences gained by these types of consulting projects. We continue to find new and better ways to serve our clients through a blend of creativity and technical ability while drawing on the experience and expertise of many decades immersed in the industry," the firm said. "We continue to find new and better ways to serve our clients through a blend of creativity and technical ability while drawing on the experience and expertise of many decades immersed in the industry."

Gilbert Associates Inc. has claim to dozens of U.S. flag passenger vessels built to its designs, ranging in size

Gilbert Associates Inc

from 50 feet to over 300 feet including the 154 ft ferry vessel Captain Richard G. Spear for Maine Department of Transportation and her hybrid propulsion sister ship that is currently under construction at Senesco Marine in Rhode Island. Among other workboat projects, GAI has designed an extensive fleet of both retractable and conventional towboats ranging from 80 ft to 190 ft in length for inland river service. Notably, the firm has had at least one towboat design actively under construction in each of the last 15 years. Recent towboat deliveries include the Amy Pasentine, Stephanie Pasentine and Jared Phillips.

Glosten

Glosten is a full-service naval architecture and marine engineering firm with offices in Seattle and Providence, R.I. Since its founding in 1958, the firm has set out to "do more than design"—pioneering new technologies through in-house research and development efforts and taking on challenging projects that have the power to reshape the marine industry.

The employee-owned firm specializes in vessel design and modification, marine operations and logistics, marine offshore structures, vessel procurement consulting, technology development, and marine infrastructure. The firm's staff represent a wide variety of engineering disciplines, and many of their team members are licensed professional engineers with hands-on shipyard or seagoing experience. Their engineering capabilities extend to a variety of vessels and marine structures, including research vessels, ferries, tugs, barges, floating bridges, offshore installations, and special-purpose platforms. Glosten welcomes complex, unique projects that demand creative solutions, and has cultivated a portfolio that spans every sector of the industry.

Glosten is at the forefront of the decarbonization movement in the U.S., paving the way for hybrid, all-electric, and alternative energy propulsion systems through a variety of vessel conversion and new design efforts. Its experience with hybrid and electric propulsion systems and proficiency in developing novel designs from first principles is unmatched in the marine industry. They use their broad knowledge of methanol, hydrogen fuel cells and storage, hazardous zones, electrical power systems, pressure vessels, gas handling systems and shore power to provide expertise and guidance around the implementation of emerging green technologies in uncertain regulatory environments.

New projects include the design of a hydrogen-hybrid coastal research vessel, the design of a methanol-powered tug, and the design of the first green maritime hydrogen fueling station in the U.S. Glosten recently unveiled a new alternative fuel vessel design—a methanol-hybrid ASD tug called the SA-100. This adaptable, sensibly designed tug provides operators with a viable path to carbon-neutral operation that minimizes business risk and enhances competitiveness. The 100-foot vessel is propelled by two methanol-compatible CAT 3512E gensets powering L-drives. The gensets are complimented by twin battery

Glosten

Glosten

banks for zero-emission operation when transiting, and as "boost" for achieving peak bollard pull (90 ST). To help offset the added cost of its modern power plant, the SA-100 was carefully designed under 100 gross tons. Combining a future-ready design with reduced crewing costs puts sustainable practices within reach for U.S. tug operators.

NETSCo

Northeast Technical Services Co., Inc. (NETSCo) started in 1984 to provide engineering, design and consulting services to the maritime industry. Today, NETSCo is one of the most respected engineering firms in the United States, providing a wide range of naval architecture and marine engineering services in support of vessel design, construction, conversion, modification, operation support and FEA analysis. This includes detailed structural and mechanical system design, cargo securing and loading/unloading analysis as well as regulatory evaluation in support of class and flag/port state requirements.

With the EEDI 2022 entry into force, NETSCo is assisting shipowners with cost-benefit analyses of various alternative fuels or equipment options for ship compliance. Additionally, their engineers have developed a calculation model to establish the EEXI baseline for their fleet, offering owners solutions to meeting that index. NETSCo goes beyond typical ship projects by also providing naval architecture and marine engineering to marine terminals and facilities. Technical support and project management

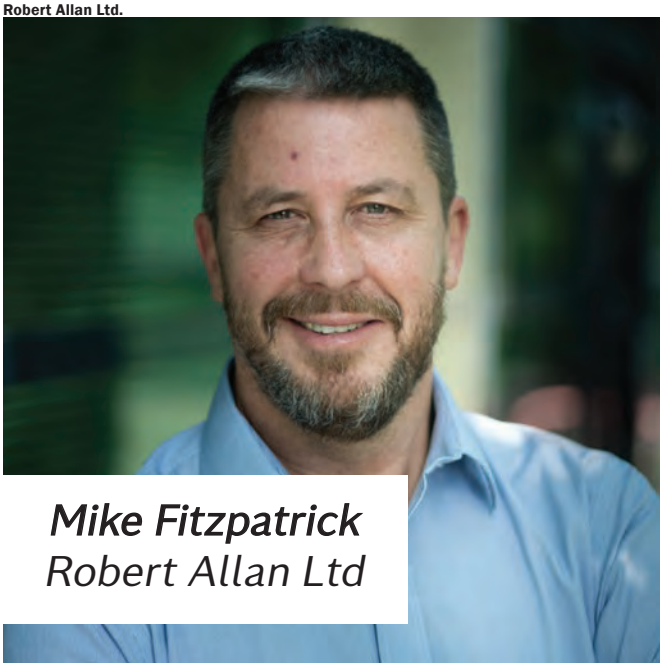
The Shearer Group, Inc.

The Shearer Group, Inc.

is also provided by NETSCo throughout all the life cycle phases of both new and refurbished vessels including safety audits, electrical inspections as well as structural assessments for aging vessels or life extensions analysis.

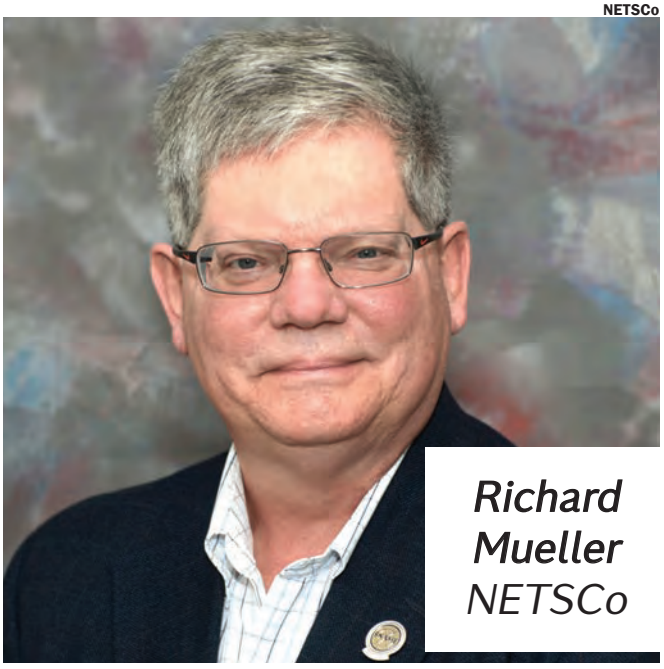
NETSCo recently finalized work on the Dragon Lady conversion, performing functional trials and inspections on the barge owned by Coastal Cement Corporation. The barge was converted to a bulk cement ship unloader permanently docked in Boston and can self-unload large cement cargo vessels via an enclosed vacuum system that will directly convey the cement from the ship into one of four 7,000 metric ton silos located on the property.

Robert Allan Ltd.



Mike Fitzpatrick
Robert Allan Ltd

NETSCo



Richard Mueller
NETSCo

NETSCo also has multiple ongoing projects in the offshore wind turbine industry. A Stowage Survey was recently completed to confirm that the stowage arrangement and cargo-securing solution that was designed by NETSCo were installed as directed. Additionally, this year NETSCo Engineers worked with other innovators in the wind turbine industry to engineer a "transformative offshore wind transportation and installation vessel solution using a Jones-Act compliant concept." NETSCo focused on designing a bespoke, cost-effective WTIV, focusing on the design parameters that matter most and eliminating non-essential features.

Robert Allan Ltd.

Robert Allan Ltd. is Canada's most senior consulting naval architecture and marine engineering firm, established in Vancouver, B.C. in 1930, with an international reputation for innovative designs of a wide range of vessels for service in the marine transportation industry. In particular, it has earned a reputation as a leader in harbor and seagoing tugs, shallow draft towing vessels and fireboats for major world ports.

Robert Allan Ltd. has extensive in-house computational fluid dynamics (CFD) expertise in performing detailed hydrodynamic performance simulations utilizing a powerful and continually upgraded high performance computer cluster. This capability enables the firm to deliver quick and accurate solutions at a lower cost than model tanks or external consultants. This in-house capability also allows for highly efficient design optimization.

Asked about where he sees greatest opportunities for Robert Allan Ltd. In the U.S., the firm's president Mike Fitzpatrick, said, "While we're strongly in favor of decarbonization because it's the right thing to do, it also presents an opportunity for our company. Robert Allan is somewhat unique in that we're a relatively large firm of naval architects that focuses almost entirely on small commercial workboats, whereas most of our competitors in that market are quite a bit smaller than us without necessarily the breadth of experience, certainly in terms of the number vessels that get built. So as the vessels get more complex technically, that plays into our strength here as a company. The fact that we build so many vessels means we get the opportunity to learn from each one. If you're only having five vessels built of your design every year, it takes a while to build up that experience, whereas if we're doing 100 a year, each one's an opportunity for us to learn and then apply that knowledge to the next one."

"When a vessel owner comes to us, they need to trust that we're going to give them a working vessel at the end. And I think we've built up over the years a pretty good reputation for integrating new technologies and delivering not R&D platforms, but actual working vessels. That puts us in pretty good stead going forward with most of the operators in the U.S. We have a number of really good and very loyal owner clients in the U.S. that we've developed good boats for in the past, and they look to us to develop more in the future. So, maintaining our leading position in terms of technology creates opportunity for us, for sure. "

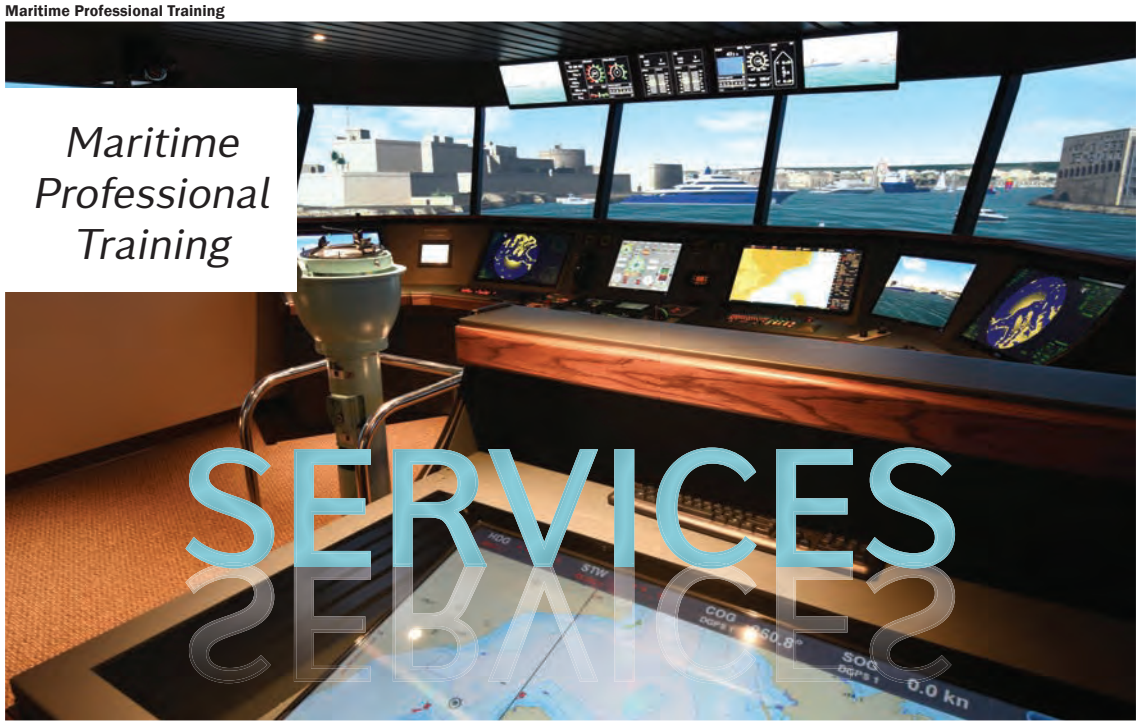
The Shearer Group, Inc.

A premier naval architecture firm with focus on the inland marine industry, The Shearer Group, Inc. (TSGI) has led the industry with several significant z-drive towboat designs, diesel electric with energy storage ferry designs, dredges, dump scows, and innovative projects like liquefied natural gas (LNG) fueled vessels. TSGI naval architects are intimately familiar with the current ABS rules and U. S. Coast Guard regulations for barges and towboats, and the company utilizes state of the art computer modeling and design tools in concert with time honored design practices to develop innovative and functional designs.

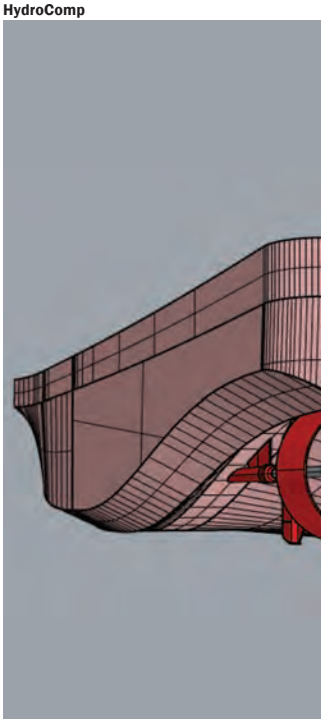
TSGI's marine engineering practice focuses on the design of new vessels, but its engineers also work on repowers, vapor control systems, and mechanical and electrical upgrades. TSGI also offers marine surveying and construction oversight services. These services can be in support of new construction projects, modifications, regularly scheduled dry dockings or more comprehensive maintenance periods.

The firm specializes in inland workboats, including ferries, towboats, dredges, drydocks, marine construction equipment, dump scows and tank barges. TSGI has recently been awarded an IDIQ with TXDOT to provide engineering services required for the preparation of plans, specifications, and estimates, and construction services to update existing passenger-vehicle ferry vessels and marine shore-side facilities. TSGI has also been tasked with designing a modern, high-efficiency ferry for the Crosby-Lynchburg ferry service in Houston. The new design will feature increased passenger and vehicle capacity and reduced environmental impacts compared to the existing 40-year-old fleet. Other recent projects include the detail design for a 76' ice breaking tug for USACE and the repowering of TXDOT ferry John W. Johnson from diesel-electric to diesel-electric with battery propulsion.

Maritime Professional Training



HydroComp



ABS

Houston-based ABS, a leading global provider of classification, sustainability and technical advisory services to the marine and offshore industries, is committed to setting standards for safety and excellence in design and construction. Focused on safe and practical application of advanced technologies and digital solutions, ABS works with industry and clients to develop accurate and cost-effective compliance, optimized performance and operational efficiency for marine and offshore assets.

ABS, led by CEO Christopher J. Wiernicki, has enjoyed a standout year, supporting the industry with significant advances in technology, sustainability and vessel design. To highlight a few, ABS worked with HHI on its landmark autonomy project, supported Robert Allan Ltd with delivery of the first vessel to be designed, built and verified entirely in 3D, and worked with Sdari and Thorden on a revolutionary new vessel design with a novel aft layout, which eliminates pollution and promotes efficient vessel operations.

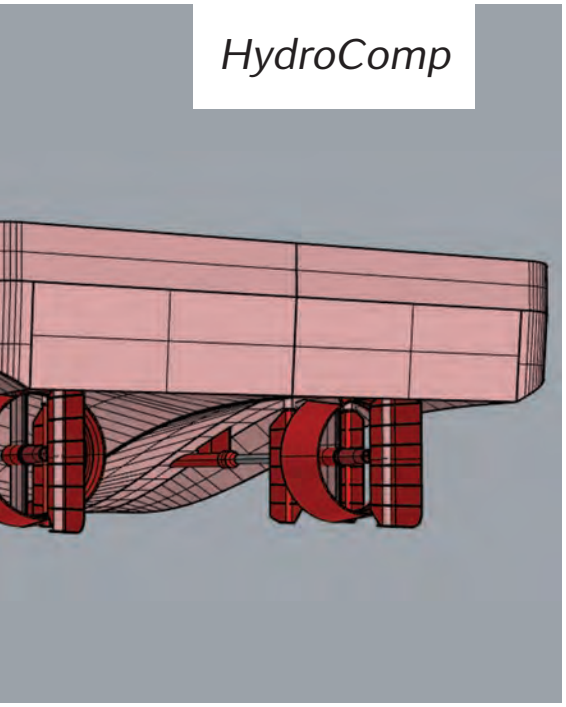
The ABS-classed fleet has grown to 279 million gross tons, and ABS has the number one position in global orderbook share. ABS is not only number one for new order share in the U.S., but also in China, Singapore, Taiwan, South Korea, Greece, Denmark, Brazil, Singapore and Hong Kong.

The American Equity Underwriters

The American Equity Underwriters, Inc. is the program administrator of the American Longshore Mutual Association Ltd., a group self-insurance fund authorized by the U.S. Department of Labor to provide USL&H coverage for the liabilities of its members under the United States Longshore & Harbor Workers' Compensation Act. AEU works with insurance brokers to provide USL&H coverage to employers who are members of ALMA, including shipbuilders, ship repairers, marine terminal operators, stevedores, marine contractors and other waterfront businesses of all sizes. AEU is the leading provider of this highly niche form of insurance. In fact, more than 1,500 waterfront employers—the most of any USL&H provider—trust the experts at The American Equity Underwriters, Inc. with their longshore workers' compensation needs. The Longshore Act presents many challenges for employers and they require a true expert to help navigate this federal workers' compensation law.

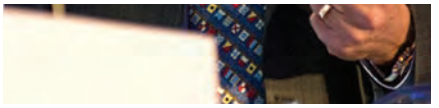
HydroComp

For more than 30 years, HydroComp has been a leader in providing hydrodynamic software and consulting services for resistance and propulsion prediction, propeller sizing and design, and forensic performance analysis.

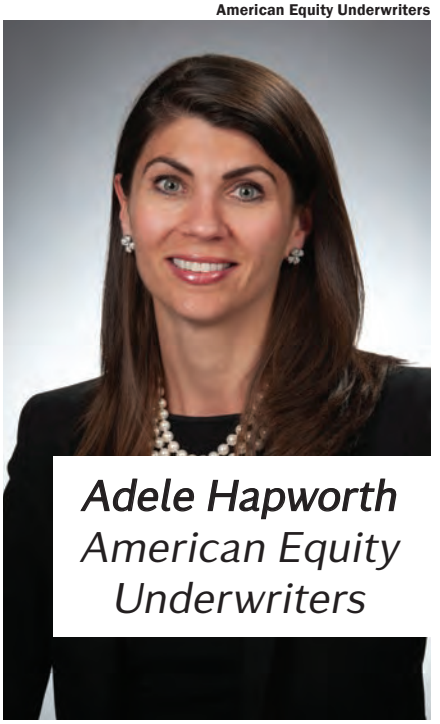


ABS

Christopher Wiernicki
ABS



American Equity Underwriters



Adele Hapworth
American Equity Underwriters

Through its unique array of software packages and services, the company now serves more than 1,500 naval architectural design firms, shipyards, yacht owners, ship operators, propeller designers, universities, and militaries around the globe. Offering hydrodynamic and propulsion system design tools for naval architecture and the propeller trades—from concept to 3D CAD, and consulting services—HydroComp's core mission is providing engineering tools to develop ships, boats, and other marine vehicles—and their propellers—more efficiently and responsibly. Its software and training accelerate time-to-market with superior outcomes for products and designs.

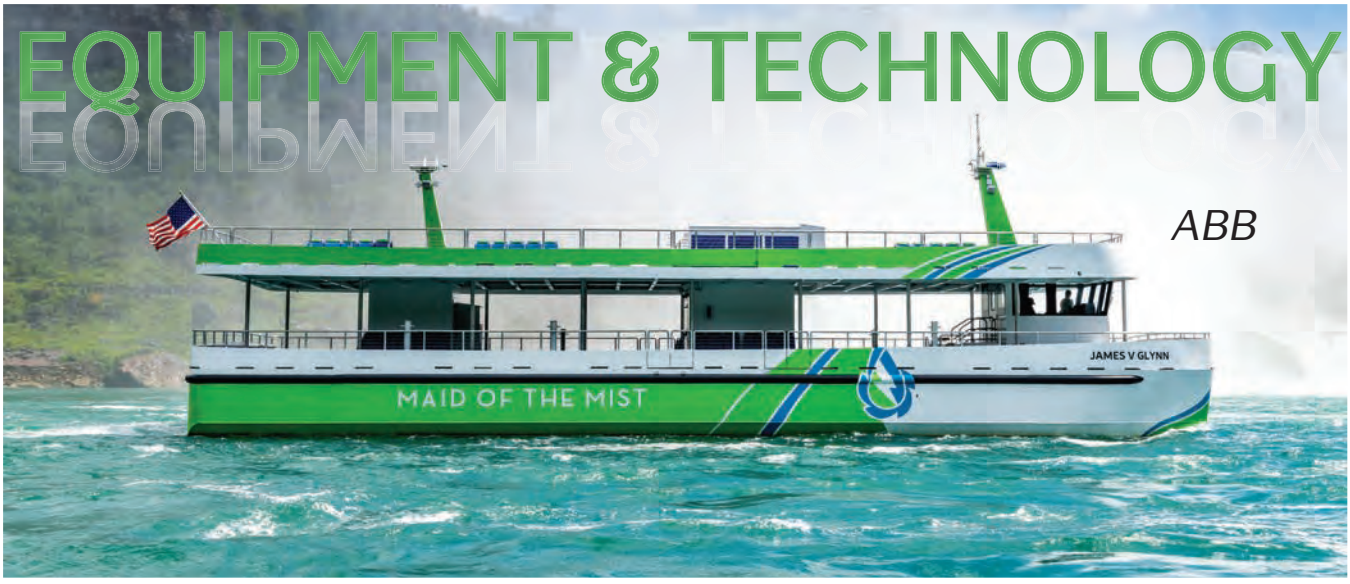
Recent developments include new electric drive motor feature for propulsion simulation. In addition, HydroComp's NavCad software 2022 has been updated with a new Simple Towboat method for prediction of hull-propulsor coefficients and an update to the drag prediction models for barges with true box-like sterns. Electric motors has been updated with AC three-phase motors for added motor efficiency & power. HydroComp can now provide engineers and designers with a critical missing piece when conducting trade-off studies, evaluation and validation of trial data, or calculations of operational battery budget. Full propulsion system DC motor metrics can then be predicted, including current draw, mechanical-to-electrical efficiency, and electrical input power.

Maritime Professional Training

Founded in 1983, Maritime Professional Training (MPT) is one of the largest private maritime training school in the United States, serving more than 12,000 students annually, training for careers in both the commercial and yachting segments of the maritime industry. Under the direction of the Morley family for two generations, MPT has trained thousands of commercial mariners, yachting professionals, and enthusiasts for more than three decades. This in depth experience has enabled MPT to develop programs that are success-oriented, with unbeatable pass rates, as well as being cost and time efficient.

Located in Fort Lauderdale, Fla., MPT prides itself on being the most complete full-service private maritime school in the country, offering all levels of certification, license and document study programs, many of which offer in-school testing, are USCG, MCA, Marshall Islands, and Nautical Institute approved and are recognized by many foreign administrations. Programs are designed to meet and exceed IMO standards and are fully STCW Compliant. MPT's campus hosts an expansive area of classrooms, deck and engineering departments, multiple class A Full Mission bridge and engineering simulators, as well dynamic positioning labs.

ABB



ABB

ABB is a technology leader that is driving the digital transformation of industries, operating in more than 100 countries. The company has provided electric and hybrid systems on board vessels for more than 110 years. In fact, today, well over 1,300 ships employ ABB's electric system. In the shallow draft segment, ABB offers electrical, hybrid, propulsion and automation solutions for vessels such as towboats, dredges, tugs, marine construction and ferries.

Asked about recent highlights, Ed Schwarz, ABB's Vice President of Sales for Marine Systems, said the the last year was a combination of performance and advocacy. "In 2022 the Maid of the Mist will complete its second year of operation of their all-battery vessels. ABB is very proud to have supplied the electric propulsion and shore connection for these very important vessels. These vessels are proving what is possible. ABB has supplied electric/hybrid systems to over 60 vessels and as result in 2021 reduced emissions by 76% for these vessel operations, the resulting saving of 68 Kt of CO2, the equivalent of removing 15,000 passenger cars annually. ABB is expecting even greater results in 2022."

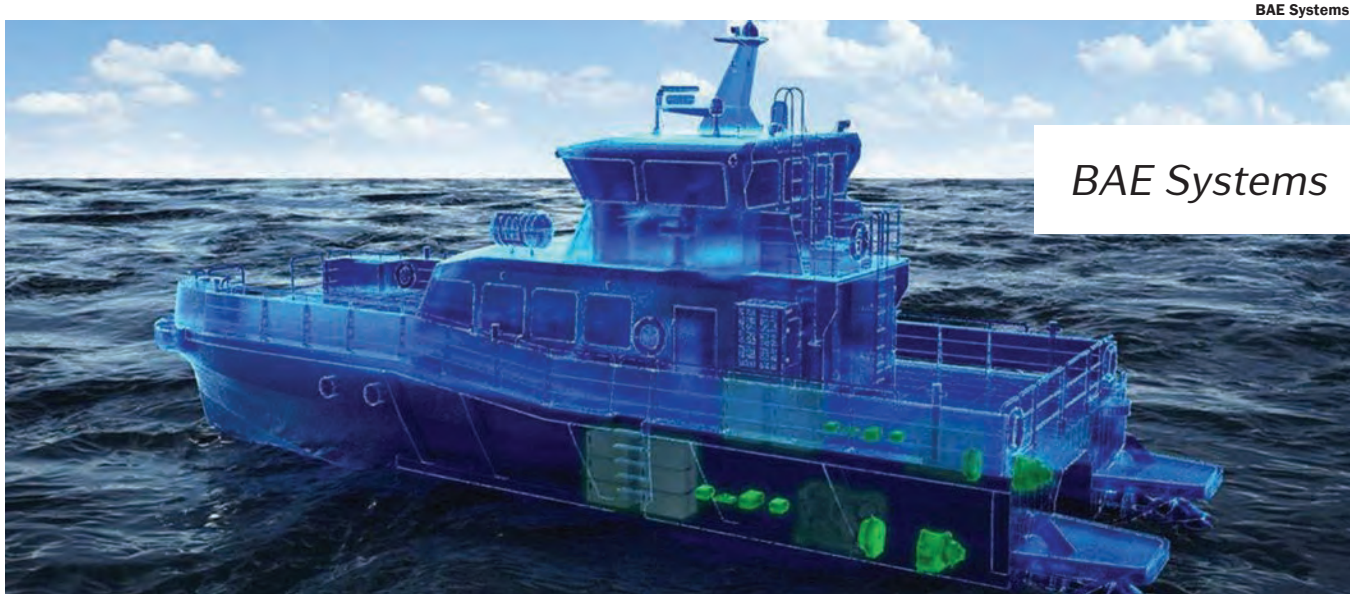
Schwarz said ABB sees plenty of opportunity in the U.S. commercial marine space. "The short distant shipping segment is perfectly situated to green disruption. There is the culminating alignment of technology, vessel aging and public funding right now to help ferry, tug, towboat, dredger and fishing vessel owners make the transition to hybrid systems. Electric propulsion has proven itself among owners of many different vessel types. Now electric propulsion systems are available to help long-established vessel owners in the U.S. market to solve some the modern challenges.

"Just as the diesel engine superseded steam, the combined benefits of emissions reduction and operational savings of electric propulsion represents the next generation of vessel design for the U.S. waterways, from which there is no going back! "

Appleton Marine, Inc.

An employee-owned company for over 30 years, Appleton Marine, Inc. designs and manufactures a wide range of custom marine offshore and shipboard products and specializes in integrating this equipment with ship systems. Not only does Appleton supply cranes, winches, windlasses, capstans, hose reels, and other special systems, they are experts in combining the gear into a cost-effective turnkey solution. The company provides handling solutions for commercial/military shipbuilding, offshore oil, and many other market segments. It offers the advantage of being a single-source supplier for all the customer's deck machinery needs including cranes, winches, hydraulic power units, etc., reducing the customer's total ownership cost during equipment start-up/commissioning, and later if a spare part or service is required. Appleton Marine also offers build-to-print services and has extensive experience working on projects for the U.S. Government. Among notable recent projects, AMI is providing the deck equipment for MARAD's new National Security Multi-Mission Vessels, cranes for the USCG's OPC program, as well as cranes and other equipment for a number of commercial and naval build and refit programs.

BAE Systems



BAE Systems

BAE Systems has been designing and manufacturing electric drive systems for 25 years and today has more than 15,000 systems in operation. The company delivers propulsion and power management capability with innovative electrification products and solutions that advance vehicle mobility, efficiency and performance. Its electric drive systems deliver solutions to decrease emissions, save fuel and provide a quieter mode of travel. Low emission electric hybrid vessels, zero emission battery electric and fuel cell electric powered boats are powered by BAE's proven systems.

BAE Systems has launched its next-generation power and propulsion system for the marine market. The HybriGen Power and Propulsion system is a flexible solution to help operators reach zero emissions – improving electrical efficiency and vessel range, increasing propulsion power, and simplifying installation. The system uses smaller and lighter components for vessels, and its modular accessory power system (MAPS) and modular power control system (MPCS) allow for a scalable, tailor-made solution to fit the specific power and propulsion requirements of a range of vessels, from sailboats and tugs to passenger ferries. "Our investment in this next-generation technology will provide marine operators with cutting-edge capabilities to create clean transportation," said Steve Trichka, vice president and general manager of Power & Propulsion Solutions at BAE Systems. "Using a modular design, we can customize our solution to meet the exact needs of each customer, simplifying the installation and improving system reliability. The increased propulsion power and electrical efficiency mean our customers can now accelerate their journey to zero emissions."

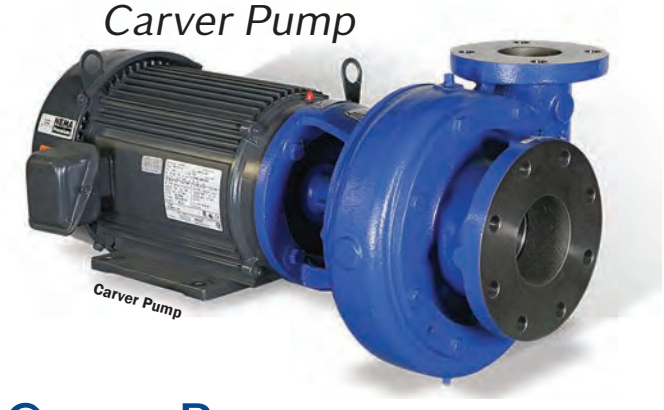
Appleton Marine, Inc

BAE Systems' electric propulsion technology supports low and zero emission applications with proven controls and components that are available in multiple system configurations. Green City Ferries announced BAE Systems will be a key supplier in providing an emission-free propulsion system for Beluga24–the world's first high-speed emission-free catamaran passenger ferry. BAE Systems power electrics will support two emission-free options – battery electric for short journeys and hydrogen fuel cell for long ones. Senesco Marine is installing BAE Systems' HybriGen Assist parallel hybrid system on the Maine State Ferry for all-electric propulsion capabilities, power regeneration, and electric boost for high power performance.

C-Hero

EQUIPMENT & TECHNOLOGY

Carver Pump



Carver Pump

Carver Pump is headquartered in Muscatine, Iowa, where its pumps are engineered and manufactured. The company, now under third-generation family ownership and commitment to American manufacturing, has been recognized since its inception as one of the leading centrifugal pump companies, building to the most demanding engineering specifications and military standards in the world. Carver Pump has been part of every major U.S. Navy program since World War II.

The firm's is addressing challenging performance requirements using advanced design tools: the latest solid modeling software for analyzing structural problems, and exceptional hydraulic design capabilities. It has refined its expertise by delivering tens of thousands of pumps into a wide variety of applications, routinely developing new products for very specific usage, such as its tank-mounted 855 Series and new naval ship systems, for example. Many of Carver's standard products can be highly customized for specific OEM applications, such as parts-washing systems and boiler/heat-exchanger cleaning systems. Whether the challenge is pump efficiency, difficult suction conditions or extreme environments, Carver Pump will engineer a solution to meet user goals for reliability, quality and performance.

C-Hero

C-HERO produces man overboard recovery products, designed by a tugboat captain, specifically for the tugboat industry. Its systems allow for an underway one-person recovery of a helpless person from the water. The company's founder and president, Shane Smith, was born into the tugboat business and never left. He brings to the company 30 years' captain experience, a wealth of on deck knowledge, a passion for the water and saving lives and a desire to make a difference in MOB recovery. Smith had personally been involved in a failed man overboard rescue attempt, and the incident drove him to create a solution: C-Hero Rescue Systems, a firm with the mission is to get crew back on board should they find themselves in the water.

The company started with the bitt mount rescue davit and has grown to offer a full product line for all vessels, including land-based rescues. New in 2022, two new rescue davits join the flagship system providing for expanded levels of capabili-

David Clark Company

David Clark Company

ties and price points. The creation of the C-Hero Rescue Kit permits for a compact version of the capable Recovery Pole.

David Clark Company

David Clark Company has more than two decades of experience providing wired, wireless and digital boat crew headset communication systems. The firm's noise-attenuating headset systems are used worldwide in a variety of critical communication applications by civil and government personnel in the marine, aerospace, aviation, fire/rescue and industrial markets.

"Having served the marine industry for over 20 years, we're now seeing an increased emphasis on boat crew communications. The Series 9100 Digital Headset System is being perceived as a necessity, rather than an 'accessory' by many workboat crews due to its simplicity, versatility and mission flexibility," said Bob Daigle, David Clark Systems Manager.

The company's business is expanding internationally in a variety of markets including foreign navies and law enforcement agencies, fisheries and offshore service/transport vessel sectors. Domestic system installations are ongoing for the U.S. Navy, U.S. Coast Guard, U.S. Department of Homeland Security, National Oceanic and Atmospheric Administration, and U.S. Customs and Border Patrol interceptors.

David Clark Company also maintains ongoing relationships with a variety of OEM customers, comprised of leading international workboat manufacturers. These stra-

EQUIPMENT & TECHNOLOGY

e1 Marine

Ecochlor

tegic alliances help to enhance its products and systems to handle today's increasingly sophisticated mission protocols and marine communication applications.

e1 Marine

e1 Marine, a joint venture between Ardmore Shipping, Element 1 Corp. and Maritime Partners, was established in 2021 to deliver methanol-to-hydrogen technology to the marine sector as the industry explores cleaner burning fuels to reduce vessel emissions. The company's methanol-to-hydrogen generator solution serves as a link allowing easy-to-handle methanol—a top commodity globally, located in bunker quantities at more than 100 ports—to be converted into power-dense and clean hydrogen on board, in real time.

Robert Schluter, managing director of e1 Marine, noted that the technology is already proven but has typically been used in smaller scale power generation applications—less than 10 kilowatts of fuel cell power. Through the years, the system has been scaled up and is now ready to support the multimegawatt power needs of marine vessels. Hydrogen One, a first-of-its-kind towboat being developed by Maritime Partners, will be the first vessel to be equipped with the system.

Earlier this year, the system received approval in principle (AIP) from classification society Lloyd's Register following independent verification that the e1 Marine generator can support megawatt scale fuel cell power applications and meets all applicable regulations, codes and standards.

Ecochlor

Ecochlor was founded in 2001 to provide reliable, cost-effective, easy-to-use ballast water management systems (BWMS) that can stand up to the most stringent regulations in the world. In 2021, Ecochlor introduced the filterless, EcoOne BWMS with hybrid variants which includes all the benefits of its traditional system – no TRO sensors, no electrodes or complex power supplies, no need to treat or neutralize at discharge and an option to gravity ballast as well as low power and maintenance costs. This has been a hugely successful enterprise, almost 98% of current sales are for the EcoOne filterless or hybrid systems. The savings for installing this system can be significant as it requires 40% less piping and 30% less cabling. In August 2022 Ecochlor announced the launch of a containerized design for the filterless, EcoOne BWMS for the offshore market. The filterless, EcoOne Container Unit has the unique benefit of only needing one BWMS to handle four quadrants for semi-submersible rigs or sea chests for jack-up rigs. It also allows for gravity ballasting on uptake and discharge, and has very low power requirements. Plus, a single unit can be easily shared between multiple rigs and/or vessels.

Ecochlor is diversifying and has invested substantial time and resource bringing to the market the most innovative "green marine" technologies available. Ecochlor is uniquely positioned to assist the shipowner with selection and implementation of these new environmental marine technologies and regulatory compliances through our collaborations, partnerships and in-house R&D.

Environmental Marine Inc.

Iridium

Environmental Marine Inc.

Environmental Marine Inc.

Environmental Marine Inc (EMI) manufactures USCG certified Type II Marine Sanitation Devices. Located in Bronston Ky., EMI has been in business for 24 years, primarily serving the workboat industry, government projects as well as the pleasure boat industry. The company uses unique HD Polyethylene rotational molded tanks, which makes them leakproof and corrosion resistant.

Made from HD Polyethylene they are corrosion free for extended longevity and light weight for easy installation. They are very low maintenance and the most cost-effective MSDs in the industry. available in three primary sizes: four-, 12- and 16-person systems. Additional units may be added to accommodate need.

Iridium

Iridium Communications Inc., headquartered in McLean, Va., has been at the forefront of global maritime connectivity for over 20 years and is part of the fabric of maritime communication systems, including GMDSS (Global Maritime Distress & Safety System). Iridium is the only mobile voice and data satellite communications network that spans the entire globe, enabling real time connections between people, organizations, and assets anywhere on the planet. Together with its ecosystem of partner companies, Iridium delivers an innovative and rich portfolio of reliable solutions for markets that require truly global communications. In 2019, the company completed a generational upgrade of its satellite network and launched its new specialty broadband service, Iridium Certus. Iridium has connected all manner of mariners from solo adventurers, merchant marines and large vessels up to cutting edge autonomous vessels, providing mariners at sea with the most reliable truly global and weather-resilient satellite communication solutions on the market. Iridium's established GMDSS solution is the first of its kind, enabling anyone at any location at sea to request assistance in an emergency, providing critical features such as voice calling.

Marine Jet Power

EQUIPMENT & TECHNOLOGY

Marine Jet Power

The L.S. Starrett Company

The L.S. Starrett Company

Founded in 1880 and headquartered in Athol, Mass., The L.S. Starrett Company is a leading global manufacturer of precision measuring tools and gages, optical comparators and vision systems and force and hardness testing solutions. Generations of craftsmen and toolmakers have relied on Starrett precision tools and gages. With proven quality and expert technical support, Starrett is the name chosen by professional contractors and tradesmen to guarantee repeatability and accuracy in their precision hand tools. Starrett also has a diverse selection of tapes, levels, protractors, utility knives, hand saw blades and other construction products including its M1 Lubricant for rust and corrosion protection. Starrett power tools include diamond edge hole saws, Dual-Cut jig saw blades and a variety of reciprocating blades such as "3X Power" Bi-Metal Reciprocating Saw Blades.

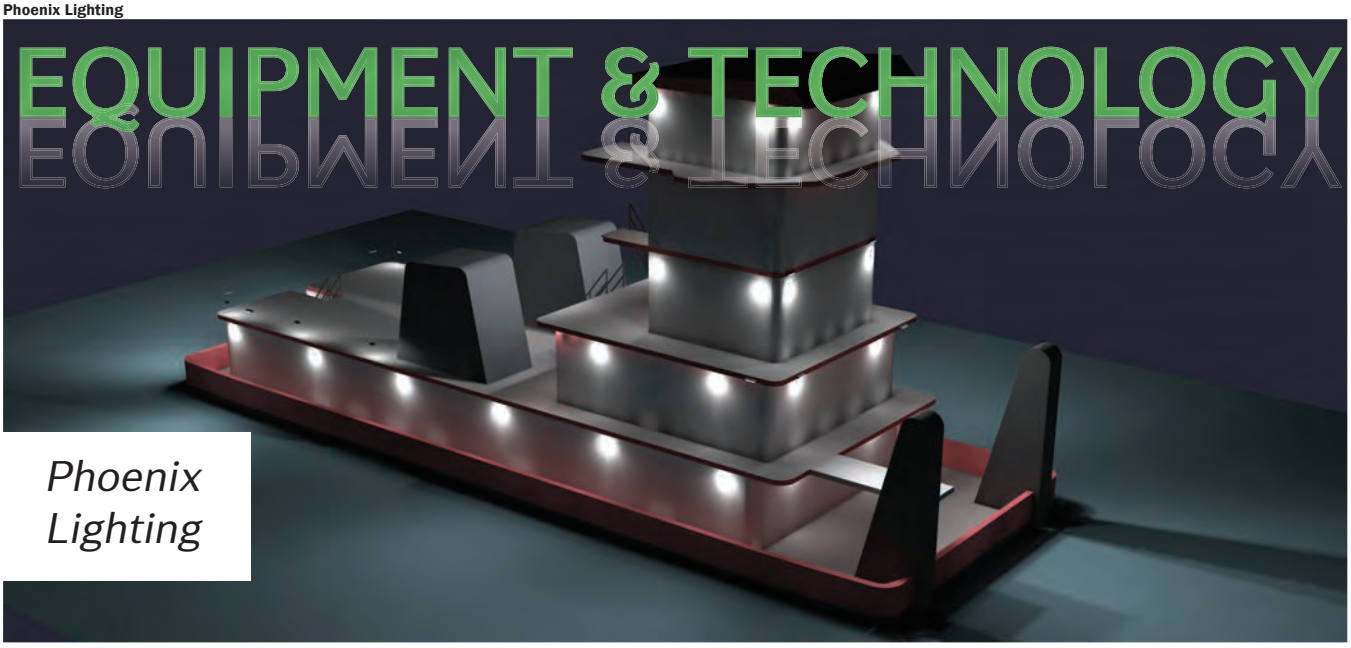
Marine Jet Power

Engineered and built in Sweden, Marine Jet Power's (MJP) proven stainless steel, mixed-flow and aluminum, axial-flow waterjets are used in many diverse applications, from fast military craft and passenger vessels to luxury yachts and workboats worldwide. Over 100 million running hours strong, MJP waterjets are designed with low operating costs and ease of maintenance in mind.

The company recently launched the next generation of waterjet propulsion, the X Series, engineered for demanding, high speed applications with a premium pump that improves performance and efficiency. The X Series provides users with more power in a lighter unit that burns less fuel and extends range over comparable alternatives, thereby reducing cost of ownership. Marine Jet Power is also charging into the future with an all-new lineup of electric and hybrid waterjet solutions that aim to reduce total energy consumption and CO2 emissions while offering improved performance, intelligent technology, and trusted quality. MJP has worked closely with marine industry partners to engineer two electric/hybrid options that produce serious power and reliability.

Marine Jet Power delivered its first ever set of waterjets in 1987 to the Cinderella II, a passenger vessel operating ferry service in Sweden. Today, you can still find the vessel operating in the Stockholm Archipelago with original MJP waterjets still in operation. The 350-passenger ferry operates a daily schedule from Central Stockholm to Sandhamn Island.

Phoenix Lighting



Mascoat

For over 25 years, Mascoat experts have combined technology, application history and extensive testing to provide some of the best coatings available for thermal insulation, condensation protection and sound control. The company serves a wide variety of industries with coatings designed for unique needs in those areas; commercial, industrial, marine, automotive and more. Mascoat's marine thermal barrier and sound damping coatings are formulated to meet the harsh marine environments and unique insulation requirements of the maritime industry. Its coatings are currently used on thousands of vessels around the globe—from barges and workboats to luxury yachts and military craft. Mascoat's marine condensation control coating resists water buildup, and prevents corrosion under insulation (CUI). Sound damping solutions like tiles can debond and fall off over time, while the company's sound damping coating bonds directly to the primed surface, ensuring it will stand the test of time.

Phoenix Lighting

Phoenix Lighting, based in Milwaukee, Wis., and now in its 130th year of business, is a manufacturer of rugged, highly durable lighting products for some of the world's toughest applications, including maritime and ports/terminals among others. "On the maritime side, it really started in our early days, providing lights for U.S. Navy, and applications that demand rugged, durable, vibration-, shock- and corrosion-resistant lighting for the specific application," said Ryan Hertel, the company's president of business development. "We are focused on designing and building lights for each application. From the beginning, we're understanding of marine applications, the demands, the lighting performance requirements, and creating specific products for the application rather than trying to sell generic product, and convincing people that it's ready for a boat."

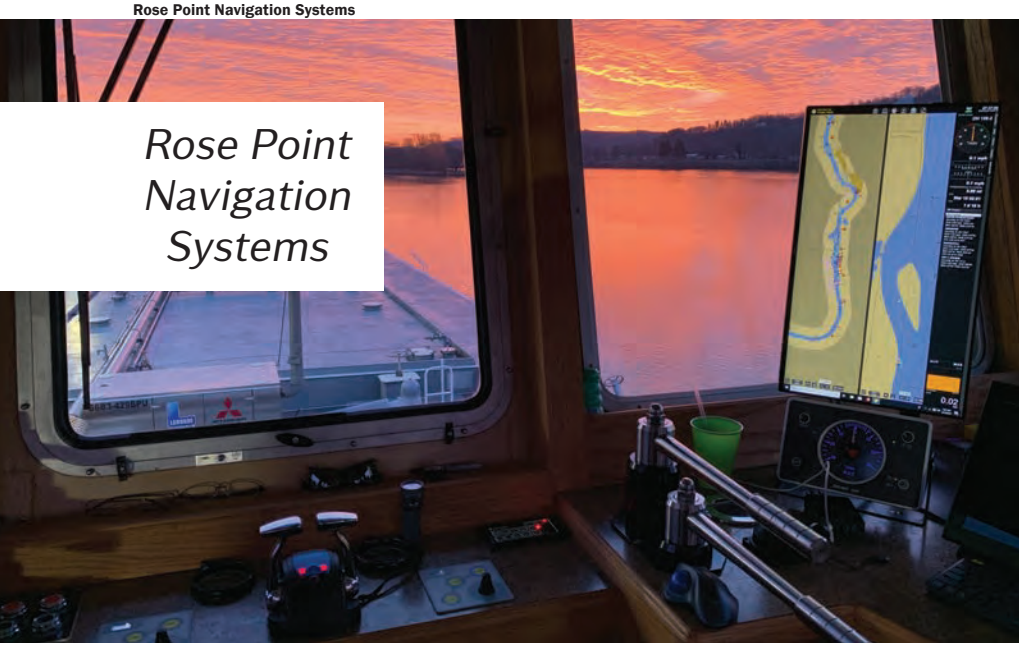
Phoenix, which designs and produces all of its products in the U.S.A., has a strong presence in the U.S. and Canadian commercial and government marine businesses, with a loyal customer base that includes the U.S. Navy as well as some of the top names in the towboat and dredging industries. The company also has its sights on the quickly growing U.S. offshore wind market. "We see quite a bit of opportunity in all things, and all vessels related to offshore wind service, even on the towers themselves," Hertel said.

"Our approach has been to be a trusted go-to supplier of lighting for the complete lighting package on board," Hertel said, noting that Phoenix can present the lighting designs and an entire lighting package from navigation lights, to exterior lighting, all the way through to interior lighting. "In order to position ourself for success, we've worked a lot on expanding our product line. For example, the LED SturdiSignal navigation series launched last year has been a great success so far with a number of customers transitioning to using those."

Rio Controls & Hydraulics Inc.

Rio Controls & Hydraulics Inc. (RCH) is a full-service engineering, manufacturing and service company for ves-

Rose Point Navigation Systems



Rose Point Navigation Systems

Mascoat

Rio Controls & Hydraulics

sel systems and hydraulic services. It utilizes innovative design and ABS approved equipment to provide efficient and cost-effective solutions, also stocking completed systems to respond to quick turnaround situations. RCH provides full hydraulic service, repair, rebuild and replacement for cylinders, pumps, valves and any other hydraulic components. RCH has continued to grow by partnering with Sea Machines to provide remote and autonomous systems, becoming a distributor for Quincy Compressors to service and rebuild compressors, and started a CNC machine shop to build cylinders with nano paint technology. RCH has submitted an energy efficient steering system to USCG for approval that provides on demand steering in a compact format. This system reduces the hydraulic oil requirement, eliminates piping and reduces the steering system energy consumption by up to 60%.

Rose Point Navigation Systems

Rose Point Navigation Systems is a leading provider of navigation solutions for professional mariners. The company was founded in 2003 by an ex-Microsoft software development manager with a passion for boating and creating software. Today, it offers best-in-class marine navigation software, charts and hardware accessories trusted by thousands of mariners around the world to plan and navigate safely to their destination. Rose Point came to the market in 2004 with Coastal Explorer, still the leader in recreational PC-based navigation. It didn't take long for the commercial world to adopt the software and in soon Rose Point ECS was introduced to better suit the needs of commercial users, and the Light Inland Commercial market in particular. Today, Rose Point Navigation Systems ECS, and ECS with Inland Add-On are the gold standard for inland marine commercial navigation. Over 90% of fleets in the inland commercial market use it, according to the manufacturer, noting dramatically improve fleet management efficiency and reduce operating costs.

EQUIPMENT & TECHNOLOGY

R.W. Fernstrum & Company

Scania

R.W. Fernstrum & Company

R.W. Fernstrum & Company has been part of the commercial marine industry for over 70 years. The introduction of the FERNSTRUM GRIDCOOLER Keel Cooler in 1949 created the fully assembled, packaged keel cooling products seen today. Fernstrum's sole focus is heat exchangers, and its expertise in the market bears that out. The company can provide a variety of options to best fit any new or existing application.

Menominee, Mich. based Fernstrum has expanded on its heat exchanger expertise and product offerings by adding partners to an ever-expanding keel cooler product line. Since 1997, Fernstrum has been working with Weka Marine in The Netherlands for the sales and manufacturing of copper nickel WEKA Boxcoolers for the Americas. Fernstrum has been representing Tranter Heat Exchangers for 14 years across the Americas with its SuperChanger plate and frame heat exchangers. More recently, Fernstrum has contracted with Omega Thermo Products to make its Laser Plate prime surface heat exchangers available across the commercial marine market.

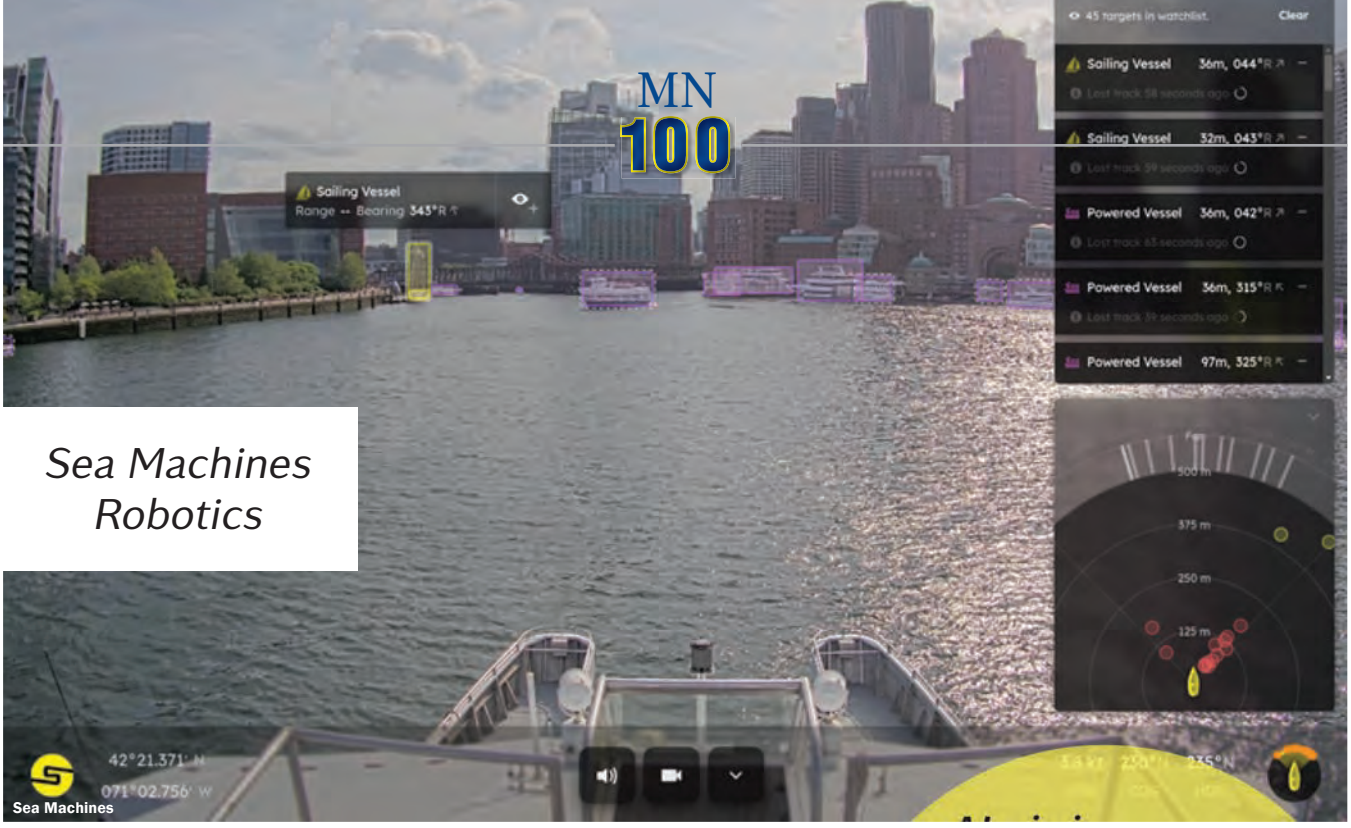
"We appreciate our relationships and the position it places us in," said the company's president, Sean Fernstrum. "In a new age, we can still do business in an old-fashioned way. Relationships through trust, quality, exceeded expectations, people talking to people instead of automated systems, we provide this and the heat exchangers to match it across the globe. We innovate with our products and cultivate our relationships."

"The global reach and variety of products, combined with a record of quality and service standards, place us in a position to be part of a wide variety of projects recognized in the industry," Fernstrum said. The company counts among recent notable projects the Weeks Marine dredge RB Weeks being built by Eastern Shipbuilding as well as the Great Lakes Dredge & Dock dredge Galveston Island being built by Conrad. It has also recently supplied equipment for Birdon Bridge erection boats, LCU 1700 series landing crafts being built at Swiftships, Saildrone's autonomous vehicles and the largest LNG bunkering barge in the U.S. for being built by Fincantieri Bay Shipbuilding Crowley.

"We set an expectation of exceeding our customer's expectations, from tailoring a heat exchanger to their specific needs, to completing rush orders for no additional charge, to expecting standard product performance to last decades," Fernstrum said. "We are a family business and we take that seriously."

Scania

Scania's customer-specific power solutions—consisting of a variety of products and expert services—help improve industrial and marine processes, increase uptime and productivity, reduce operational cost and minimize environmental impact. They are the result of more than a century of cutting-edge engineering and continuous improvement—always focused on reliability and efficiency. Scania USA is a subsidiary of Scania CV AB of Sweden and the importer for marine, industrial and power gen-



eration engines in North America. Scania manufactures marine engines ranging from 220 HP to 1,150 HP with class-leading fuel efficiency, unrivaled power-to-rate ratio, and relentless performance at any speed.

This year, Scania is launching its hybrid marine solution, the E-machine. Its in-house developed electric solutions draw on Scania's long experience, knowledge, and technology from electrifying on-road vehicles, resulting in high system reliability and outstanding performance in a compact design. "The growing shift towards being sustainable strongly aligns with Scania's core values—to drive the shift towards a sustainable transport system, creating a world of mobility that is better for business, society and the environment," said Jörg Franzke, president of Scania USA. "The launch of our electrified power systems will give customers a hybrid and fully electric solution. With a potential CO2 emission reduction of up to 92%, Scania's hybrid electric system combines an e-machine with a combustion engine—either together or as standalone power sources. The fully electric system enables a potential CO2 emission reduction of up to 98% if the electricity is generated from renewable sources."

Sea Machines Robotics

Sea Machines Robotics is building the future of ocean mobility by revolutionizing marine navigation with data-driven intelligence, autonomy, and connectivity. The Boston-based company builds autonomous command and control technology and long-range computer vision perception with the goal to increase the safety, efficiency and performance of ships, workboats and commercial passenger vessels worldwide. Founded in 2015, Sea Machines has grown from a tech startup to a recognized industry leader, having raised over $30 million and contracted to deliver advanced technology and products by some of the world's most recognized organizations on water. Today, it is aggressively deploying systems on vessel operating around the world.

In addition to its SM200 commercial-grade, wireless helm system providing full bridge control away from the wheelhouse or from another craft and SM300 autonomous command and control system for commercial vessels, Sea Machines this year unveiled AI-ris, a new marine computer-vision navigation sensor designed to improve safety and performance while vessels are underway. AI-ris, (Artificial Intelligence Recognition and Identification System) uses digital cameras and AI-processing to detect, track, classify and geolocate objects, vessel traffic and other potential obstacles in the majority of operational conditions, day or night, to equip crew with best-in-class situational awareness. Computer vision helps improve safety for vessels and is also a critical technology for the advancement of autonomous command and control systems.

Sea Machines operates the world's most active test fleet for validation of these advanced technologies. Autonomous test vessels include Steadfast, Lightning, Nellie Bly and Maverick. The company has built and maintains one of the largest marine data sets in the industry, which it uses to support its AI-powered computer vision systems.

Schottel

Schoellhorn-Albrecht Machine Co., Inc.

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Schoellhorn-Albrecht is one of the leading designers and manufacturers of marine deck equipment, dock equipment and vessel access systems, possessing vast knowledge of the marine industry gained over more than 130 years of experience in the business. Schoellhorn-Albrecht has enjoyed a long history in St. Louis supporting inland river industry. The company began by providing steamboat engines and deck equipment for river boats built in Alaska and used on the Yukon River during the gold rush. Today, Schoellhorn-Albrecht is located in St. Louis County, supporting the entire marine industry worldwide. In addition to its standard product line, the company also specializes in designing and manufacturing castings, fabrications and specialized machinery to meet any customer's needs.

Schottel

The SCHOTTEL Group, with its headquarters in Spay/Rhine, is one of the world's leading manufacturers of steerable propulsion systems for ships and offshore applications. Founded in 1921, the company is still owned by the original family and has been developing and manufacturing azimuth propulsion and complete propulsion systems with power ratings of up to 30 MW for vessels of all sizes and types for 70 years.

Whether azimuth thruster or controllable pitch propeller, main propulsion unit or manoeuvring aid, rudder propeller or automation system, SCHOTTEL claims to offer

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SONARAY

the largest portfolio of propulsion and control systems on the maritime market, covering a power range from 50 to 30,000 kilowatts. In addition to optimizing existing systems, SCHOTTEL works continuously to develop new products and services.

With expansions within the SCHOTTEL Group, SCHOTTEL grows even stronger and its areas of activities even more diversified. The industrial holding company SCHOTTEL Industries GmbH purchased majority stakes in the electric system integrator elkon and newly founded AQUOS, a company specialized in marine technologies such as innovative underwater anchoring systems. The industrial holding company now comprises six companies with more than 1,500 employees worldwide.

SONARAY

SONARAY LED Lighting is a Central Virginia based technology division specializing in lighting for marine, industrial, and solar applications. SONARAY is part of a diverse set of business units under the DASCOM Americas parent company and has been developing LED lighting solutions for nearly a decade.

SONARAY strives to set the standard for brown or blue water marine craft, shipyard, workboat, or bridge lighting. The company's LED lighting is just as at home in shipyards, ports, on fishing craft or in the world's toughest environments like the Bering Sea where SONARAY outfits vessels there with unique, custom color temperatures to cut fog and allow safe navigation. The company also gets the job done for tugs and workboats working the Gulf Coast or for ports in Panama, with lighting that helps mariners and commerce traverse the open water.

Recently SONARAY completed a marquee installation over the Cumberland River in downtown Nashville on a prominent historic bridge, with 299 of its toughest LED flood lights now bringing safety and the wow factor to the bustling city.

United Safety - Fireboy-Xintex


United Safety - Fireboy-Xintex

Volvo Penta

United Safety - Fireboy-Xintex

United Safety and Survivability Corp. is a leading supplier of safety equipment in the transportation and other industries. With its acquisition of Fireboy-Xintex in late 2021 it is now involved in the marine industry among others. There have been many changes in the fire suppression and detection sections of the safety products industry this year—important to keep in mind for companies designing and updating their vessels. Fireboy has been a leader in these areas since 1973 and remains on the front end of it yet again. The manufacturer is a leader in clean agent fire suppression systems, fire detection systems and methane, gasoline and propane detection systems. It also manufactures carbon monoxide detection systems for marine and other applications, and its marine CO alarms are standard on many boats alongside its gasoline and propane detection systems. Fireboy supplies pre-engineered suppression system to cover up to 4,000 cu. ft. and engineered systems for spaces up to 17,500 cu. ft. Its systems are USCG and MED approved for use around the world, meaning the company can handle nearly any application.

Volvo Penta

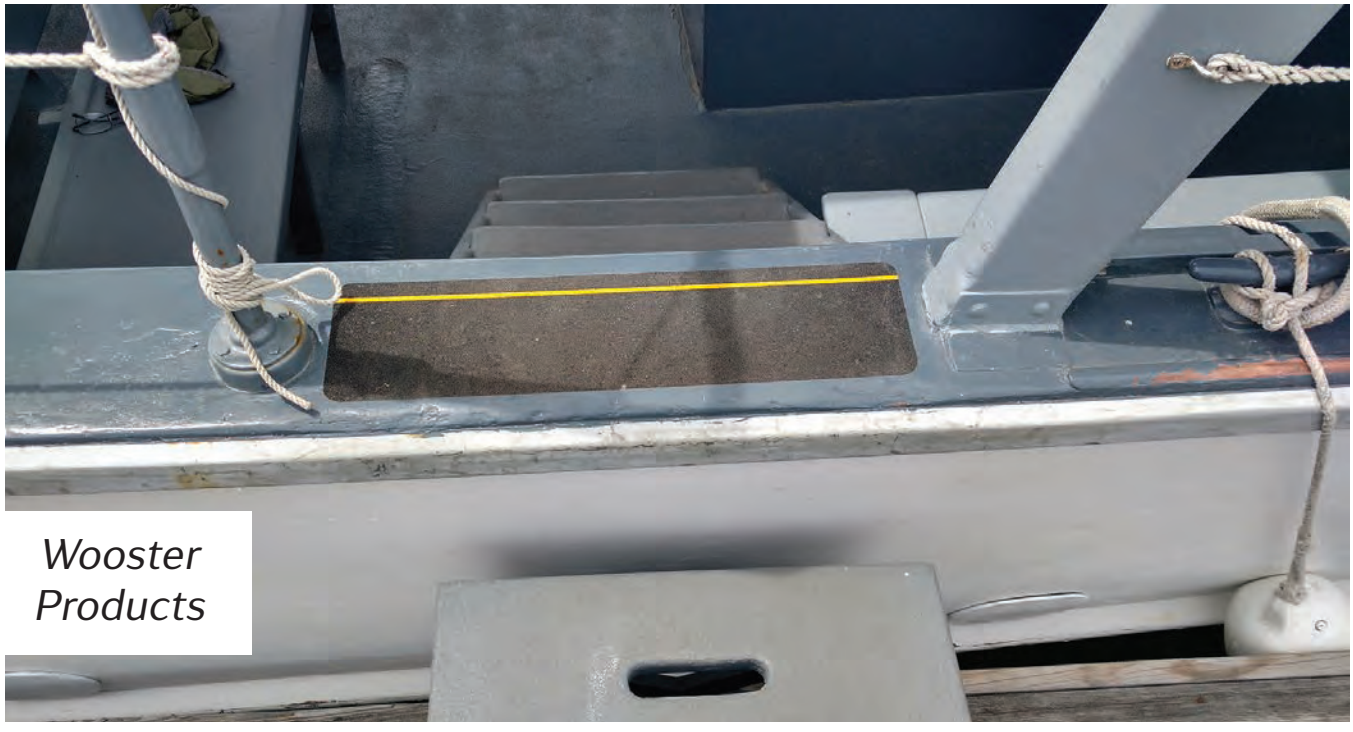
Fully integrated helm-to-prop propulsion systems have been a hallmark for Volvo Penta through the years. “It’s been a strength on our side for a few different reasons. First of all, as a customer, as a builder, you get a one point of contact for a large part or the entire part of the drivetrain. It means that you have a natural interaction with us across the build process, and even more importantly, when there is something wrong, because there will always be a service need or something,” said Johan Inden, head of Volvo Penta’s global marine business unit. “The second part is that it gives opportunity to design the experience in an even stronger way . . . For us, that integrated system gives very

EQUIPMENT & TECHNOLOGY

World Wide Metric

World Wide Metric

Wooster Products



Wooster Products

strong responsibility and also an innovation platform. If I take that to the next step to hybrids or full electric systems, you will benefit even more from that, because then you have to be in full control of the entire driveline, and it will be even more of an integrated system with a new setup for your electronics, your power system, your power management, et cetera."

Volvo Penta, as part of the Volvo Group, has committed to having a climate neutral impact by 2050. The company aims to offer a broader range of hybrid and full electric products to the market by 2025, and Inden said Volvo Penta sees 2030 as a "tipping point" for the uptake of green propulsion technologies in the marine industry. The company recently announced the launch of a new range of variable speed marine generator sets—a key enabler for electric propulsion for marine vessels—as the industry's transformation toward sustainable marine propulsion continues to gain momentum.

Wooster Products

Wooster Products only manufactures slip-resistant products and has specialized in this for over 100 years. The company continues to develop new products to address customer needs, like its NITEGLOW photoluminescent technology for emergency egress stairways, safety nosings with two-part construction to keep safety stair nosing in pristine condition during construction until the building is handed over to new tenants, Flex-Tred anti-slip tapes in a wide palette of colors to match many color schemes, and more.

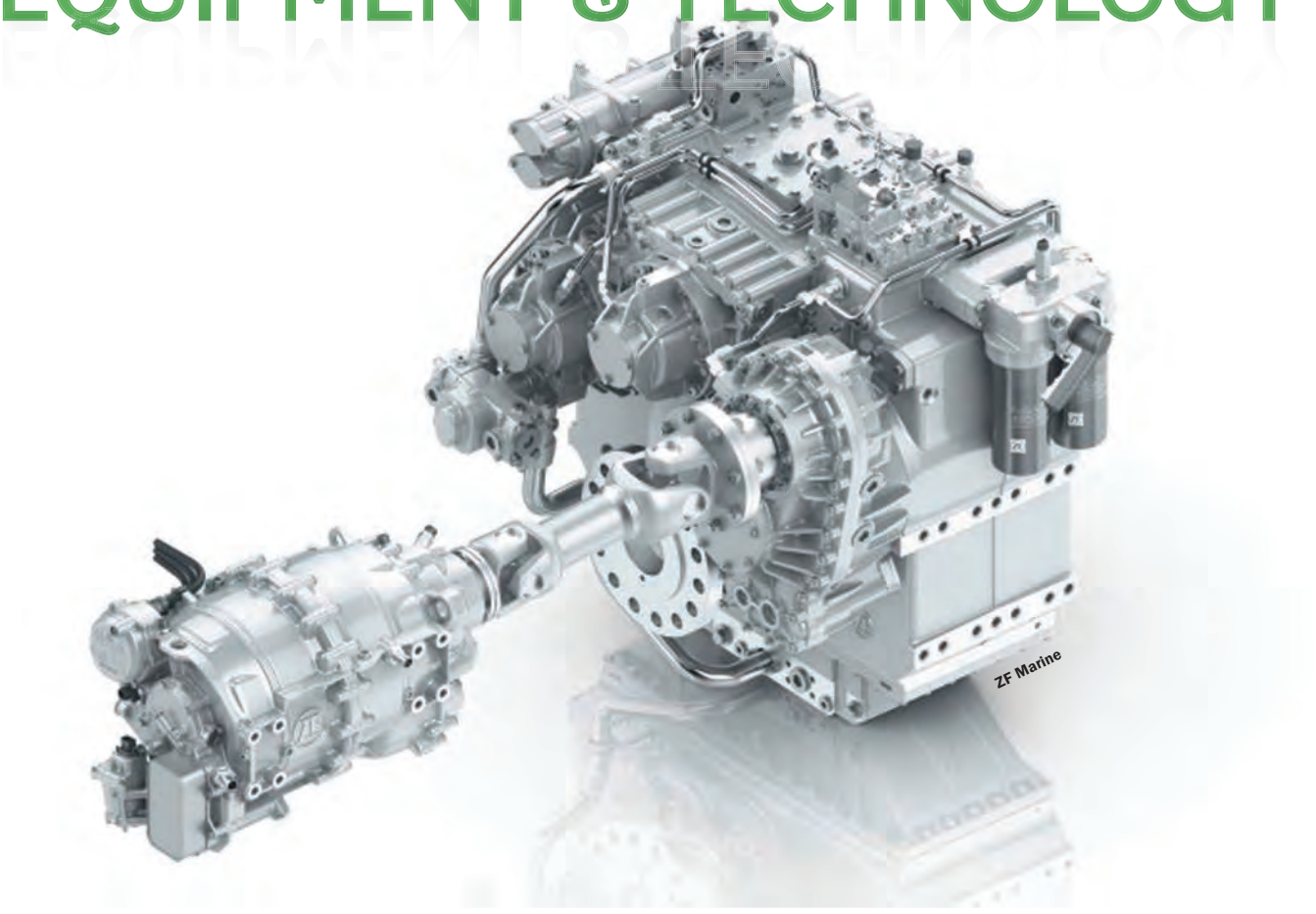
Wooster's NAVSEA treads and cap treads provide sure footing for sailors and those ascending or descending ladders aboard vessels where it is applied. With a high coefficient of friction these provide sure footing even when wet. Its Flex-Tred tapes enhance safety on stairs, walkways, gangplanks, deck surfaces and other areas aboard ships, near deck machinery, on docks, marinas, and in and around marine areas, and are available in a wide range of colors, sizes and shapes to suit marine applications.

Wooster has longstanding relationships with the U.S. Navy and U.S. Coast Guard as well as major cruise lines like Carnival and Norwegian Cruise Lines, as well as ferries and smaller specialty cruise lines line Hornblower Cruises. Among the shipyards that purchase from Wooster are Bollinger Shipyards, PEMCO Naval Engineering Works and Bath Iron Works.

World Wide Metric

World Wide Metric is a pipe valve and fitting supplier specializing in metric products that has been serving the maritime industry as a trusted advisor for more than 50 years. "Although we may not be as well-known as our competitors—likely because our focus is more on the metric side of valve and fitting supply rather than the ANSI side—we have been quietly working behind the scenes to support the maritime industry and many of the suppliers, shipyards and end users throughout North America and around the world," the company's CEO George Contos said. "Our efforts to train and teach our people to be knowledgeable professionals as well as courteous, helpful and happy tells you bit about our culture and how we operate. We have a real family environment and we treat our clients and vendors with that same flavor."

EQUIPMENT & TECHNOLOGY



ZF Marine

For more than 100 years, ZF Marine has provided commercial and recreational boaters with industry leading marine propulsion systems that include transmissions, controls, propellers, fly-by-wire steering, thrusters and more. The company is recognized as an innovative, reliable partner for both marine propulsion components and complete systems for all types of vessels. ZF Marine supplies gearboxes, reverse gears, transmissions, propellers, rudder propellers, bow thrusters and steering systems for a wide range of applications with a power range from 10 to 12,000 kilowatts in both commercial and fast ships as well as pleasure boats and yachts.

ZF recently partnered with Mercury Marine to develop the world's first two-speed transmission with automatic shifting for the 600 hp Verado outboard—a groundbreaking technology. Additionally, commercially available hybrid-capable transmission models are available including ZF 3000, 5000, 9000, 11,000, 24,000 and 40,000 series with more to come. Among other benefits, installing hybrid transmissions enables vessels to operate with reduced emissions. The company is also working on an advanced line of "smart" transmissions that will provide predictive maintenance features, as well as remote monitoring.

ZF's propulsion system is aboard the fully electric ferry that set a record for the longest voyage on a single-battery charge (50nm). The vessel, Ellen, broke the record in June in Denmark. Ellen is powered by 2 ZF W7640 NC marine transmissions. The reduction gears without shift clutch drive the fixed propellers. The electric motors can reverse, changing the direction of rotation of the propeller, and thus the direction of the ferry. The feat will be submitted to the Guinness World of Records.

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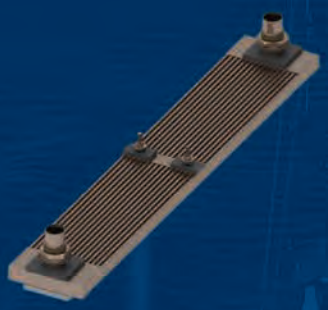

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