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Marine News

JANUARY 2022

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Propulsion

Canada's First All-electric Ferry Enters Service

Passenger Vessels
It's a winding path back to 'normal'

Dredging
New infrastructure dollars are a welcome boost

Maritime Training
Feeling the effects of COVID-19

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On the Cover

The newly retrofitted electric ferry Marilyn Bell I is the first in Canada to be powered completely by a zero-emissions, lithium-ion power and propulsion system containing no diesel fuel components. *(Photo: PortsToronto)*

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Editor's Note

Eric Haun, Editor,
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Challenges in the North American maritime sector are as plentiful today as they've been in recent memory. COVID-19, crew/staff shortages, supply chain headaches, you name it; participants in this industry are battling a monster with an infinite number of heads. Chop one off, and another (or more) is sure to appear.

Those counting challenges will note the passenger vessel sector has been handed more than its fair share. This part of the wider maritime industry—which was undoubtedly booming prior to the current pandemic—is today plying through another layer of fog as the highly contagious omicron variant adds a new layer of uncertainty to the already clouded picture. Another head for the monster!

Still, the show must go on, and passenger vessel owners and operators are doing their very best to plot future courses. Mike Corrigan, head of trade association Interferry, delivers his outlook starting on page 14, followed by Barry Parker's assessment of the sector on page 18.

Other parts of the industry, such as dredging, for example, have a good challenge on their hands: too much work in the backlog. Dredging companies are keeping a close watch on the historic new raft of infrastructure dollars due to float their way, Tom Ewing reports staring on page 30.

Companies involved in hybrid and electric propulsion projects are also seeing interest, and more importantly contracts, perk up. This month, we highlight the Marilyn Bell I, which was recently refit and returned to service as Canada's first all-electric, zero-emissions ferry. The story starts on page 24.

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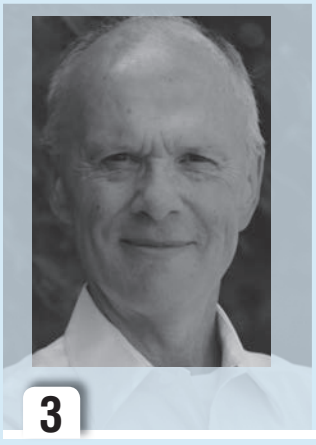

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By the Numbers

COVID-19's Impacts on Maritime Training

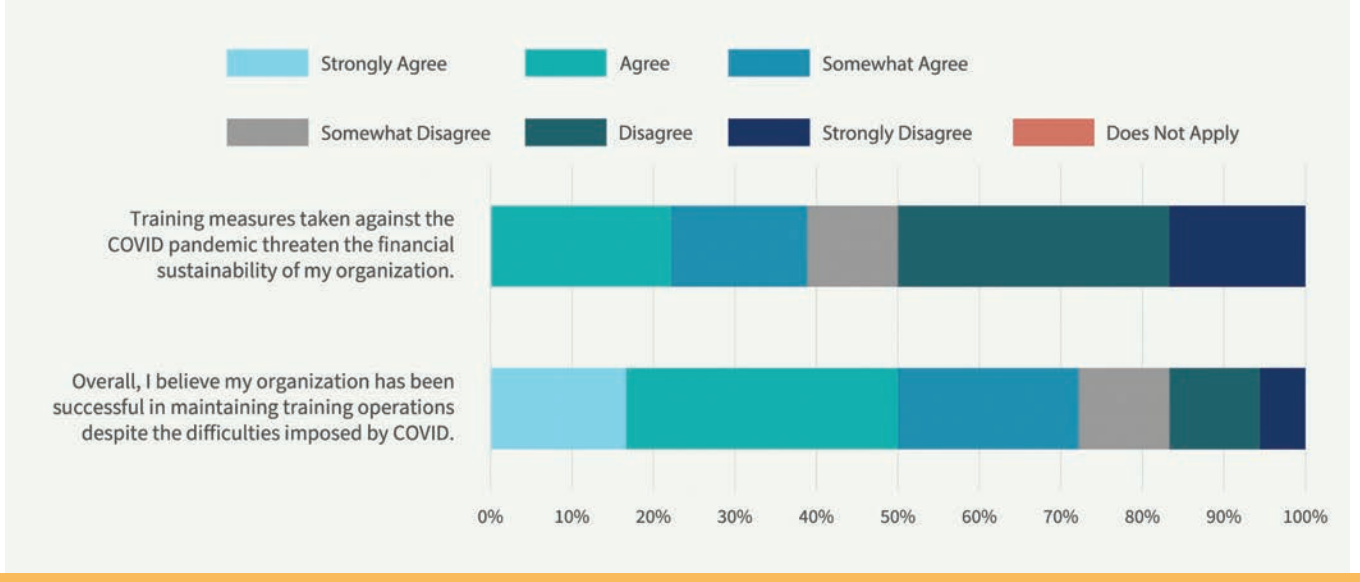
There are few human endeavors untouched by the global COVID-19 pandemic, and maritime training has arguably been affected more than most. This year's Maritime Training Insights Database (MarTID) report from the World Maritime University New Wave Media and Marine Learning Systems uncovers the challenges that have arisen and the industry's response to those challenges, but more explores how those challenges and responses will permanently shape the future of maritime training.

While past surveys have revealed a consistent trend of growth in training budgets for vessel operators, roughly 30% saw a decrease in this year's training budget when compared to last year's, and an additional 50% saw no increase in their budgets. Many of the respondents cited COVID-19 as the cause of the reduction or lack of growth.

On the other hand, 45% of maritime training institutions increased their training budget over the previous year, and nearly 60% indicated that they expected their budgets to increase for the upcoming year. This may be related to the need to acquire new training infrastructure—particularly for delivery of training online—precipitated by the pandemic.

Notably, the pandemic has accelerated the adoption of remote, online training tools. This increase is expected to persist, as operations return to normal. More than 75% of operators who responded indicated that they had moved nearly all in-person training to remote methods. These are expected reactions as nearly 90% of operators report that their ability to deliver training has been affected by travel restrictions and other impediments. More than 60% of responding operators expect that this training slowdown has created a backlog which will have to be cleared as the effects of the pandemic ease.

Still, it's clear from the report that face-to-face training remains a critical component of mariner training, and more than two fifths (41% strongly agree or agree) of respondents believe their training delivery practices, such as the tools and methods used, will return to pre-COVID status once the pandemic is over. Even more operators, nearly half, are optimistic and believe that training levels will return to pre-pandemic levels. A further 29% somewhat agree that pre-pandemic levels of training will return.



Read the full report at
https://magazines.marinelink.com/NWM/Others/MarTID2021

Q&A Robert Galinski

DNV Offshore Wind Director, Americas

While Robert Galinski has served as DNV's Offshore Wind Director, Americas, for just about one year, he is well-versed and long-tenured in the offshore wind sector in Europe and the U.S. for more than a decade, starting his career in offshore wind managing the fabrication, assembly and installation offshore wind farms on the west coast of the U.K. and Belgium. Relocated to Houston in 2019, today Galinski is responsible for the management of operations and strategy related to DNV's classification business for offshore developments in the Americas.

After numerous stops and start, the wind business in North America is finally picking up steam, with the political will established and funding starting to flow to meet the Biden Administration's 30/30 mandate – 30 gigawatts (GW) of offshore wind power by 2030.

"The 30 by '30 target has really put the offshore wind on the map in the U.S.," Galinski said in a recent interview. "The potential for development of clean energy using offshore wind was known for some time, but there was always—and there still remains in some circles—this reluctance to how cost effective this can be. The commitment we see from the federal government is encouraging."

While there remain numerous hurdles to jump before offshore wind is running at speed in the U.S., Galinski maintains that there is strength in numbers. "By mid-2020s, we'll see multiple commercial-scale projects coming online," he said. "We must ensure that we leverage the experience from existing projects (both existing domestic) and other parts of the world, especially in Europe, to avoid delays and negative financial impact. It's up to the supply chain to react as a collective to ensure that the 30 by '30 targets are met, and it's encouraging to see this happening already at a good pace."

"Building a strong renewable industry for the future will be only successful once we create a strong supply chain locally," Galinski said. "Leveraging experiences from outside (the U.S.) is important, but we can't forget that we have a pioneering workforce in the U.S. that triumphed in the oil and gas industry and continues to excel in that segment. So being open to global experiences while using local expertise is a very powerful mix and a winning formula to do in

DNV

While many challenges remain to deliver the full promise of U.S. offshore wind, so too do opportunities. Robert Galinski, DNV's Offshore Wind Director, Americas discusses the offshore wind market from the perspective of class.

By Greg Trauthwein

7 to 8 years, what it took Europe 20 to do."

DNV has been involved in offshore wind since it became a scalable concept in the 1980s, and according to Galinski the organization has been involved in the vast majority—97%—of world's offshore wind projects. "This gives us an edge when it comes to global understanding of challenges related to design, fabrication, construction, installation, and operation of these turbines," he said.

Added to the offshore wind experience is more than 150 years of regulatory experience across multiple industries, from maritime, oil and gas to healthcare and food. "If we narrow it down to exposure in just offshore wind, I can tell you that we have more than 2,000 energy experts" in house, said Galinski.

Building the fleet

When assessing the many challenges ahead, invariably the availability of vessels and shipbuilding capacity come to the fore, as the offshore wind sector is seen primarily as a newbuild versus retrofit market. The cost to build vessels in the U.S. compared to the Far East, plus the rapid inflation of base product such as steel – not to mention the year's-long supply chain snarls—have all conspired to make vessel construction more challenging and expensive.

"We must not lose momentum to ensure projects don't suffer in delays," Galinski said. "Foreign flag vessels may be used in short-term, like they have been on Block Island for ease of transition. Foreign vessels, WTIVs in particular, in combination with the Jones Act feeder vessels, like those being offered by some of the designers now, are a proven alternative. For this combination, however, to continue to be viable, the cost of construction and complexity of the Jones Act feeder needs to be controlled."

As the projections for U.S. offshore wind become a reality, the shipbuilding and ship supply base should be energized to produce a variety of boats and ships, from crew transfer vessels (CTV) to service operation vessels (SOV) to wind turbine installation vessels (WTIV) and everything in between.

"Global SOV numbers in the next 10 to 15 years will be more than 60 vessels," Galinski said, "and I think the U.S. will probably take just under a third of that, if all of the

projects in the pipeline are realized," noting that CTV and SOV newbuild capability is high in the U.S. The real challenge will come with the design, construction and delivery of the larger and more complete WTIVs, particularly in the face of ever-larger turbines, expected soon to pass the 15 megawatts (MW) per unit mark.

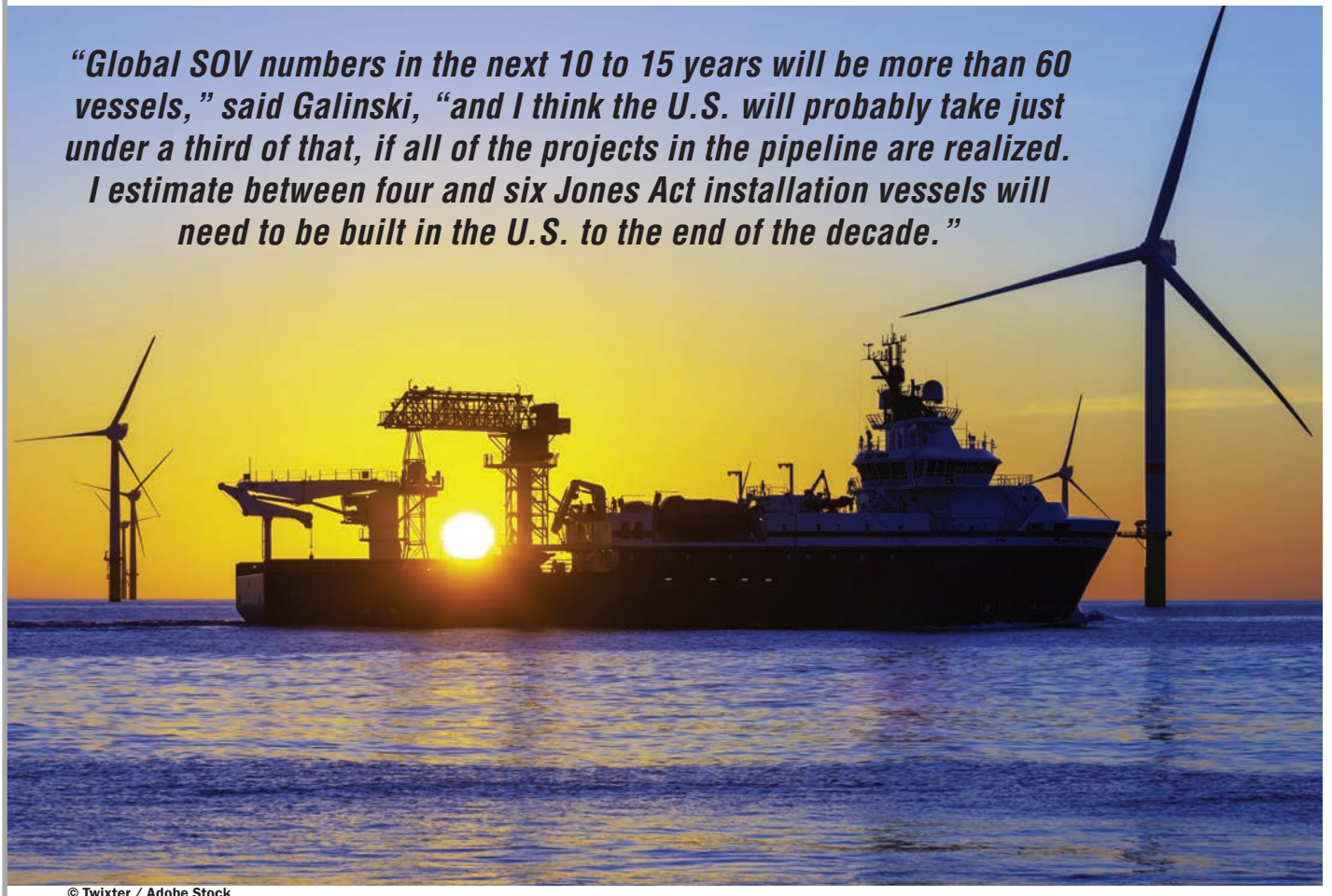
"I estimate between four and six Jones Act installation vessels will need to be built in the U.S. to the end of the decade," Galinski said.

While newbuild vessels will, in the long run, be the preferred choice premised on their efficiencies as well as the ability to design in fuel flexibility for future changes, Galinski said he expects existing vessels in the U.S. fleet to play a role in the short term.

"Given what we've discussed, there needs to be some space for existing vessels and they can certainly fill some gaps; but only up to a point. Many of the existing U.S. offshore supply vessels (OSV), for example, could support both the commissioning and the operational phase. Most likely they'll need to be retrofitted with walk-to-work systems and extra accommodation. This can be a way of getting more of the larger PSV fleets operational in shorter time, an alternative of building new tonnage," he said.

While retrofitting existing ships will plug some holes, "there will come a point where they won't be cost efficient, and it would make more sense to build a tailor-made new build, particularly for SOVs."

He estimates time window to use converted vessels at two and five years, with the long-term eye on bespoke designed tonnage that are outfitted and optimized for the task at hand, outfitted too with low emission technologies and effective energy saving systems, like battery hybrids.



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Column

Electrification

Staying Grounded About Electrification

By Sean Caughlan, PE, Senior Marine Engineer, Glosten

As a marine engineer focused on vessel design, I've watched the narrative on battery-electric and battery-hybrid vessels evolve from skepticism, to curiosity, to genuine acceptance in just a few short years. The passenger transportation sector, in particular, has been quick to embrace the concept of vessel electrification as a means of improving economics and reducing emissions. This makes sense as many ferry operations are excellent candidates for battery and hybrid-electric power due to their proximity to urban electrical grids, point-to-point operations and sensitivity to public perception.

Since Glosten supported the conversion of the Gee's Bend Ferry, the first battery-electric vehicle ferry in the U.S., we've seen a steady stream of inquiries from operators who want to know if electrification is right for them. Usu-

The Gee's Bend Ferry is the first battery-electric vehicle ferry in the U.S.

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Glosten is working with Bieker Boats to develop a carbon fiber hydrofoil ferry.

ally, the first question we're asked is whether the requisite batteries will fit on their vessel. This is a great question to start with, but there are many other factors in establishing whether electrification is a feasible option. While improvements in the energy density and cost of lithium-ion batteries in recent years have engendered a lot of excitement, it's important to have a realistic understanding of what's needed to integrate batteries into a vessel.

Commercial marine batteries need to cycle continuously day in and day out and still last between five and 10 years, both of which drive the size of the battery systems up. They are also designed and tested according to strict safety standards, critical to their long-term uptake within the industry.

Adhering to the design and installation requirements of the vessel's flag state, class society or both, may be required and is critical to maintaining and improving the safety of lithium-ion battery installations. These design and regulatory requirements all come with a cost, volume and weight penalty. Installation requirements for a battery room include cooling, ventilation, temperature monitoring, gas monitoring, and limits on the equipment that can share the same compartment. Structural fire protection is required to protect adjacent spaces from a fire, and fire suppression is also needed, similar to a Class A machinery space. So, while energy density and costs are indeed improving over time, this effect is considerably dampened by many other necessary design factors.

Depending on the size of the vessel, accommodating the space and weight for the electrical equipment needed for propulsion and auxiliary power can be a challenge. Displacement monohulls which operate at modest speeds have an easier time accommodating this equipment, which is why monohull ferries are among the early movers in the transition to all-electric. Conventional high-speed catamarans, on the other hand, will find it difficult to maintain reasonable range while fitting batteries, motors, drives, transformers and switchgear on a vessel designed for speed.

Vessel designers must manage the tradeoffs of increasing range, reducing charging time, and meeting basic vessel mission requirements—all while adhering to strict safety regulations. As technology improves over time, equipment will get smaller and lighter, but generally speaking the most straightforward means of reducing battery, motor, and power electronics size is improving vessel efficiency. To reduce the largest consumer of electrical power, typically propulsion, we must reduce the resistance of the vessel through water and waves. Glosten is working with leaders in carbon fiber hydrofoils, Bieker Boats, to overcome this challenge through the development of a carbon fiber hydrofoil ferry. The foil ferry dramatically reduces drag by lifting the hull out of the water on hydrofoils, which are essentially underwater wings. Energy consumption is reduced by 50% or more, allowing for high-speed travel with a fraction of the energy expended by traditional high-speed catamarans. Reducing the power needed to move the vessel through the water means less weight and space needed for batteries, motors and electrical gear while still enjoying the benefits of high-speed transport.

Advancements in batteries, power electronics and vessel design will all be needed in the coming years to meet the growing demand for zero-emission vessels. While the benefits of battery and electric technology are numerous, the industry must continue to educate, innovate and promote its use. As always, we must stay grounded in solid engineering and design practices and keep realistic expectations for what is possible.

Column

Passenger Vessels

Pandemic Setback Strengthens Resolve to Remain Positive

By Mike Corrigan, CEO, Interferry

Interferry CEO Mike Corrigan looks beyond the latest COVID-19 complications to explain why the global trade association has reasons to believe the industry's future is ultimately secure.

If I had been writing this column

just a few weeks earlier than late December, my opening remarks would have been decidedly upbeat. After two devastating years under the cloud of COVID-19, the pandemic seemed to be in ever-growing retreat and the passenger ferry sector was poised to turn the corner toward 'business as normal' in 2022.

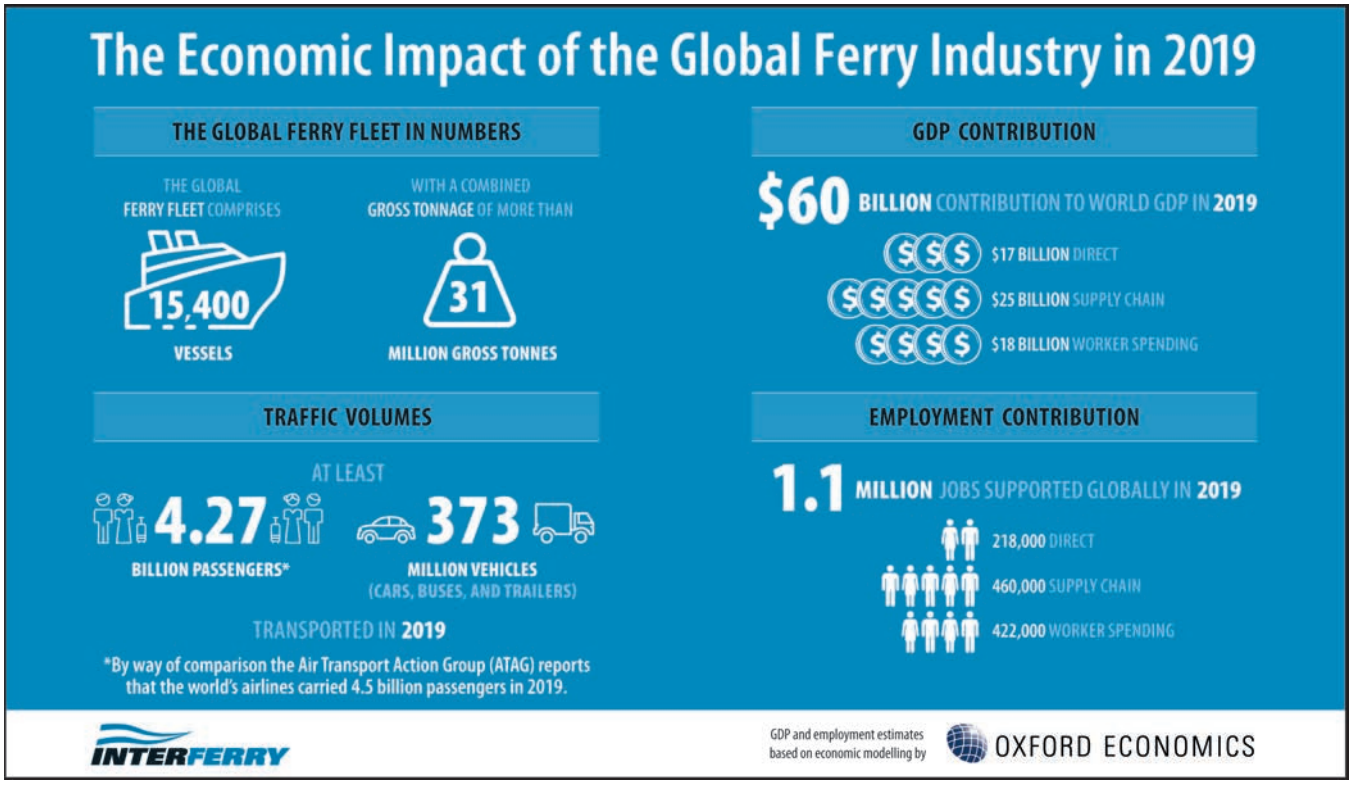
Now, however, that hope has been somewhat diluted by a single word: Omicron. This ultra-transmissible new variant of the virus has reignited the familiar flow of restrictions on life in general and travel in particular. The outlook for the foreseeable future is yet again cloaked in uncertainty, but one thing is absolutely predictable: Interferry and its membership of 260 operators and suppliers in 40 countries will continue working together to ensure commercial and regulatory readiness for the better times that surely lie ahead.

Such optimism was certainly abundant in October at our 45th annual conference in Santander, Spain. COVID had forced us to cancel the event planned for 2021, so it was especially welcome that we could reconnect with our colleagues and share insights on not only the challenges but also the opportunities that lay in store.

The buoyant mood among some 300 participants was fanned by a keynote address on London-based L.E.K Consulting's research into post-pandemic prospects for the European ferry market. Transport and logistics partner Becrom Basu said the success of vaccination roll-outs had released pent-up demand to the extent that—COVID permitting—passenger bookings could be back to 2019 levels by this year, particularly as ferries had been rated as the safest way to avoid infection compared with other travel modes. By the way, similar conclusions can be drawn from a November survey of residents in British Columbia, Canada, which suggests that ferries are best placed to build on this sentiment and further extend market share when normality is restored.

The startling size and economic impact of the global ferry industry became clear at the conference when we announced headline findings from our recently published study commissioned from specialist U.K. consultancy Oxford Economics. Based on the latest pre-COVID full-year figures, in 2019 a worldwide fleet of 15,400 ferries carried 4.27 billion passengers—matching airlines—and 373 million vehicles. Furthermore, the industry supported 1.1 million jobs and contributed $60 billion to the world GDP.

In subsequent panel discussions, nine ferry company CEOs from Europe and the Americas focused largely on what ranks as one of the greatest challenges facing our industry and the world at large—the drive to reduce greenhouse gas emissions, notably through electrification. The overriding message concerned the need for port infrastructure to enable the zero emissions initiatives being adopted by operators. Going forward, Interferry will leverage findings from the study on the industry's importance in order to encourage funding for the necessary power networks. The ferry community took responsibility for reducing its carbon footprint long before regulatory targets were im-



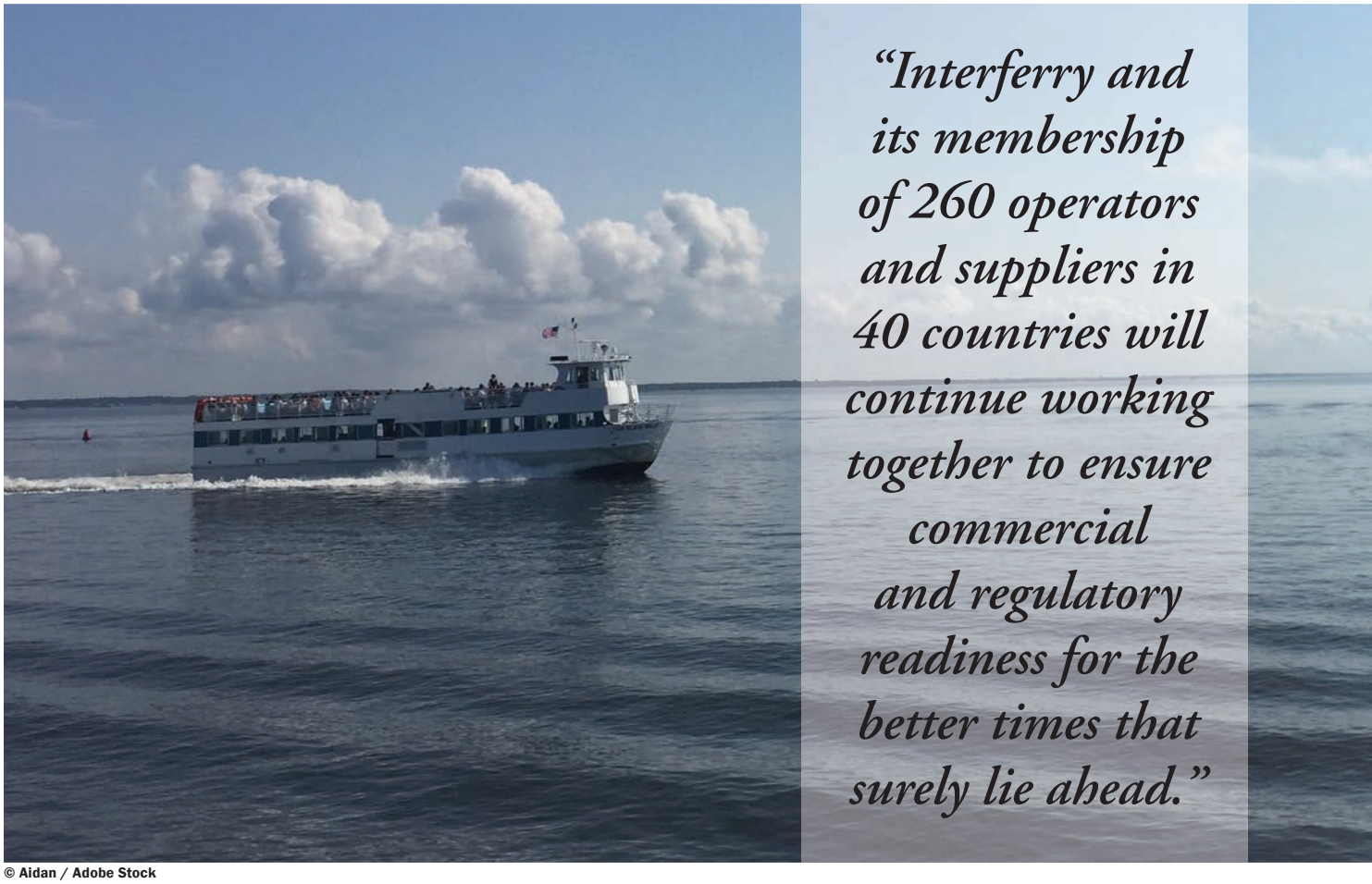
Column
Passenger Vessels

posed and this must be mirrored by the support of governments, ports and energy companies.

As you will sense, pandemic or not, our lobbying mission continues unabated. Among numerous other issues, Interferry is an integral member of an IMO ro-pax fire safety correspondence group established to draft unresolved SOLAS amendments due in force from January 2024. Having made great progress, the group will present its findings to the IMO's Ship Systems and Equipment sub-committee in March for potential adoption. Meanwhile, as coordinator of input from 11 Interferry operators, we are among 27 research and industry partners in the European Union's four-year LASH FIRE project—launched in 2019—which most recently hosted a virtual conference suggesting a string of operational, technical and insurance innovations.

In another initiative, we are calling for revisions to the specific safety regulations for high-speed craft (HSC) set out in the HSC Code, under which vessels must have a minimum design speed, typically 30-40 knots. In recent years this requirement has been questioned due to GHG emissions reduction targets, coupled with the fact that many operators have reduced speeds to cut costs. In 2019 Interferry established an industry consortium with aluminum ferry manufacturers Austal and Incat, and classification society DNV to review the implications of removing or adjusting the current requirement. We intended to submit our proposals to the IMO in 2020, but due to COVID-induced deferrals we now expect to do so later this year.

Last but not least, thanks to our leading role in helping to improve ferry safety in the developing world, we are delighted that the IMO's model domestic regulations,



"Interferry and its membership of 260 operators and suppliers in 40 countries will continue working together to ensure commercial and regulatory readiness for the better times that surely lie ahead."

in which we played a central part, are close to being finalized. We are also cautiously optimistic that our partnership with Lloyd's Register Foundation will very soon lead to a second FERRYSAFE project—following the first one in the Philippines—to assist another developing nation.

As we face the forthcoming challenges and opportunities, it's worth remembering a time-honored adage – prepare for the worst but hope for the best. The coming year will test this advice to the limit, but we are better equipped than ever to prove the value of our "stronger together" creed.

WSF

For the Passenger Vessel Sector,

It's a Winding Path Back to 'Normal'

By Barry Parker

The year just ended, 2021, might be described as being about "trying to get back to normal", across the entire transportation spectrum, two years into the pandemic. During this time, the decarbonization and electrification waves have swept across maritime passenger transport. The passenger side of the business is dependent on multiple funding sources; increasingly, this money will be driven by environmental and social considerations.

The long-awaited funding of "infrastructure"-related projects, notably the $1 trillion Bipartisan Infrastructure Law (Infrastructure Investment and Jobs Act) signed into law in mid-November, has the potential to expand the definition of "normal". Included in the bill is $1 billion for new ferry routes that would serve rural areas; $337 million for new ferries and shoreside terminals; and $250 million for The Green Ferries Act, a pilot project for low-carbon emission fuel (most likely electric) ferries- with multiple states positioned to see federal allocations.

Infrastructure support has crossed across the aisle- Alaska's Representative Don Young voted "yes", joining just 12 other Republicans in supporting the just passed legislation.

Washington State Ferries' first new hybrid-electric ferry, which will be an Olympic-class vessel similar in design to Suquamish (pictured), will be named Wishkah and is scheduled to enter service in 2025.

Following its voyage through the House, Alaska Senators Lisa Murkowski and Dan Sullivan, both Republicans, voted for the bill; Senator Murkowski was reportedly a key participant in the bill's actual drafting, including features that would point funds towards ferries serving rural communities. Skagway, Alaska was said to be positioning for an application as this program unfolds. Nearer term, plans were underway to repair Alaska Marine Highway's Tustumena and possibly replace the vessel within five years at a cost of more than $200 million.

Down the coast, Washington State Ferries (WSF) has been looking at the potential for hybrid and electric powered newbuilds. Representative Rick Larsen, a Democrat, was a major proponent of the "green" provisions in the Infrastructure Investment bill. In late December, 2021, WSF announced a contract award to Vigor Shipyard, within Seattle, to begin construction of a new hybrid diesel electric ferry (using propulsion and energy storage systems from ABB) to be named Wishkah. The boat, similar to its existing Olympic Class vessels, is expected to enter service in 2025.

Ferries are also benefiting from established federal programs. In early December, the U.S. Maritime Administration (MARAD) awarded $12.6 million in grants to nine marine highway projects under the America's Marine Highway Program (AMHP). The awardees included the Delaware River and Bay Authority, which will receive $600,000 to fund a comprehensive ferry master plan for the Cape May – Lewes Ferry, including development of a cleaner ferryboat design.

The landside also benefits from electrification, a key element of ports' strategic plans that is intertwined with funding of passenger vessel terminals, at federal, state and local levels. Consider the most recent round of Port Infrastructure Development grants (another MARAD program) announced in December, 2021, where awards included $5.2 million for the "Powering the Future" electrification project in Oakland, in California's Bay Area. A fully electric ferry powered by hydrogen fuel cells, Sea Change, a passenger vessel that will operate in the Bay Area, is in the final stages of outfitting and has been undergoing sea trials.

There are also new wrinkles in the funding of passenger vessels. Washington State, with a long-term plan for eliminating ferry emissions, has been moving toward a statewide "cap and trade" system for carbon; an unspecified slice of the funds raised through auctions of carbon allowances will be directed towards the budget for WSF (adding to traditional federal and state funding sources). In an early 2021 budget request from the ferry operator, looking forward to the mid-2030s, included estimates of $220 million needed for electrification retrofits and $300 million needed for electrifying terminals.

The passenger sector has struggled with issues similar to those facing the movement of containerized cargo and motor freight, vacillating demand and staffing shortages. While not featured on the national news alongside the anchored vessels and stacks of containers, labor difficulties have also impacted the operation of passenger vessels throughout North America, which have been bedeviled by staffing issues, even after the steady recovery in demand (and economic activity) throughout 2021. Consider that the WSF system, the largest in U.S., has now been making

On December 4, 2021, Alaska Governor Mike Dunleavy and Transportation Commissioner Ryan Anderson announced their plan to reenergize the Alaska Marine Highway System. Among the capital investments is a new ocean-class vessel to replace the 57-year-old Tustumena ferry.

Glosten

scheduling changes, restoring service in the wake of cancellations. Worker shortages saw sailings cut to 70% in early Autumn; one factor may have been a vaccine mandate that took effect in mid-October.

The delays in getting to the Infrastructure bill, and the inflationary environment that has emerged in the economy (tied into the pandemic, in the view of many economists), have also caused delays in marquee projects. In Maine, Casco Bay Lines, which saw 1.1 million riders in 2019 (and roughly half that number in 2020) has seen an extended timeline in arranging funding for its hybrid-powered Peaks Island Ferry, which would serve the coastal region from Portland, still in the design stage.

There is a silver lining—actually, several boatloads of blessings from all the pandemic-related bad news of 2020-2021. The pandemic, with restrictions on international travel, has fundamentally impacted the leisure sector. Put simply, U.S. travelers will stay closer to home. The shutdown of the international cruise industry throughout 2020 into 2021 has been front page news; domestically, leisure travel on river cruises also took a hit. However, in the theme of "bouncing back", river and coastwise cruise expansion is in the cards, with many U.S. vacationers choosing to avoid travel abroad. Dr. Andrew Coggins, Professor at Pace University and well-known expert on cruise and leisure vessels, told ***Marine News***, "The recent upsurge in the Omicron variant and resulting international travel restrictions may make U.S. river cruising more attractive. The small ship size and passenger number may make these ships more appealing. The impact of COVID should mirror the regions they sail in. One problem might be awareness in that most people don't think of river cruising when they think of cruises."

River and coastal cruising stalwart American Cruise Lines took delivery of American Melody, its fourth in a six-vessel series being built at Chesapeake Shipbuilding, located in Salisbury, Md. The September 2021 delivery follows that of American Jazz a year earlier, American Harmony in 2019, and American Song (now operating in the Pacific Northwest) in 2018, which the yard calls "the first modern riverboat in U.S. history." The fifth vessel, with capacity for 175 overnight passengers, American Symphony, will offer cruises on the Mississippi River system- delivery is set for late Summer 2022. The newbuilds' bow sections feature a retractable gangway; allowing for stopovers at destinations not considered as standard tourist destinations- and therefore lacking a traditional berth. Dr. Coggins, from Pace University, noted that: "U.S. river cruising can work to increase its awareness among the public and work with the destinations to focus on local festivals, unique museums, and historic towns." The new vessels are powered by a pair of 1,800 hp Caterpillar Tier 4 main engines, with Veth Z-drives, and Veth bow thrusters. The line is also refurbishing the 2015 built Queen of the Mississippi (and

In September, American Cruise Lines announced that its fleet of four classic paddlewheelers will be undergoing a major redesign, refit and rebranding.

ACL

American Eagle before that) now rebranded as American Heritage, set to offer itineraries on both the Upper and Lower Mississippi River during 2022.

American Cruise destinations also include the Pacific Northwest, served by American Harmony and American Melody, and a pair of older paddle-wheelers. Dr. Coggins, the leisure travel expert, opined that, "The U.S. river cruising focuses on history (Mississippi) or scenic beauty (Ohio, Columbia, and Snake) while in Europe the focus is on history and culture. However, the Rhine is quite scenic. However, the Hudson, Snake and Columbia rivers can give the Rhine a run for its money."

The voyage back to "normal" has seen numerous twists and turns; quite simply, the business has evolved. After suspending cruises in 2020, American Cruise came back gradually, with a careful plan for keeping passengers and crew safe in the new era of the pandemic; pre-boarding COVID tests are now de rigueur. They note that: "Each American Cruise Lines ship carries a Certified Medical Officer and has quarantine/isolation rooms available. American Cruise Lines has partnered with Vikand Solutions, a maritime health specialist, to provide medical services, including COVID-19 testing and coordination with medical facilities in each port of call."

A new entrant, the international small ship specialist, Viking Cruises, is set to enter the U.S. market, with its 386 passenger newbuild Viking Mississippi set to deliver

from Edison Chouest's LaShip yard in Houma, La. With its riverboat fleet, Viking has been an early adopter of diesel electric propulsion. Though headquartered in Europe, the company is on a path to achieving Jones Act compliance through an arrangement where the vessel (costing nearly $200 million, based on documents related to its financing submitted to MARAD) is owned by several U.S. based "citizen" affiliates of Edison Chouest, and time-chartered to a U.S "non-citizen" entity tied to Viking. In late 2021, a number of U.S. based competitors in the river and coastwise cruising market had voiced concern to MARAD regarding the characterization of the charter. In effort to meet the complicated set of Jones Act requirements, the operator of the vessel would be a U.S. citizen Edison Chouest affiliate, putting it onto a time charter to Viking (with Viking providing hospitality and hotel functions).

Timing is everything, and happily on the East Coast expansions are set to coincide with the return to the office for riders who worked from home during the pandemic. The Staten Island Ferry, part of New York City's Department of Transportation, took delivery of the first of three new 4,500 double-ended passenger vessels designed with quick turnarounds in mind, SSG Michael H. Ollis, from Eastern Shipbuilding (in western Florida), in Summer 2021; the vessel was formally commissioned in October 2021. The ferry, constructed at the shipyard's Allanton and Port St. Joe locations, benefits from Elliott Bay Design Group's naval architecture. The second vessel in the series, Sandy Ground, departed from Port St. Joe in early December, 2021; it will enter service in Spring, 2022, after final work at a local yard on Staten Island. A third ferry, Dorothy Day, is set for a late 2022 delivery.

Each double ended ferry features four ABS Electro-Motive Diesel (EMD) L12ME23B EPA Tier 4 marine propulsion engines, and one Voith Schneider propeller, at each end of the vessel. The vessels' cost has been reported at around $85 million, each. The ferry service, linking Staten

River and coastwise cruises are gaining interest as many U.S. vacationers are choosing to avoid travel abroad. River cruise vessel American Jazz was delivered to American Cruise Lines in 2020.

ACL

Eastern Shipbuilding Group

Island to lower Manhattan, curtailed operations in the early days of the pandemic, with ridership down by 90-95% in Spring 2020. It returned to its full 24/7 schedule in late Summer, 2021; though ridership is still below pre-pandemic levels, it has been on the upswing as employees return to their offices.

Passenger vessels continue to grow in importance as cities seek new transport options. NYC Ferries, with a fleet of smaller boats with names like Tooth Ferry and Ferry Godmother, run by Hornblower for the city's Economic Development Corp, has continued to connect outer parts of the sprawling city with Manhattan's downtown and midtown business districts, which will soon be seeing the imposition of congestion pricing. The boats, Incat Crowther designed high speed catamarans (with two series, 150 passenger, and 350 passenger), were built at Metal Shark (which subsequently absorbed Horizon Shipbuilding, also building boats in the series) and several other yards. In New York, the Trust for Governors Island (once the site of a Coast Guard base and now the site of an emerging park and recreation area) is soliciting bids (based on specifications from Elliott Bay Design Group) for a "hybrid" passenger/ vehicle ferry, with the potential for fully electric operation in the future. The island, which is home to the well-known Harbor School, is currently served by NYC Ferries.

New York's outgoing Mayor, Bill De Blasio, in a mid-December press conference, said, "This used to be a city with ferries all over the place. Over the years it became very, very few. We've turned that around with NYC Ferry, reaching neighborhoods all over the five boroughs, including a lot of neighborhoods that were transportation deserts. And we're helping people get out of their cars." For now, ordering has ceased, but ferries will continue to be part of New York's transportation scene. De Blasio added, "We're helping people have a better way to get around. And it's exciting because NYC Ferry has only just begun…"

PortsToronto

CANADA'S FIRST

ALL-ELECTRIC, ZERO-EMISSIONS FERRY ENTERS SERVICE

A newly retrofitted electric ferry is the first in Canada to be powered completely by a zero-emissions, lithium-ion power and propulsion system containing no diesel fuel components.

By Eric Haun

PortsToronto

In 2018, PortsToronto issued a request for expression of interest (RFEOI) to reduce air and noise emissions from its 96-foot Marilyn Bell I, used for transporting passengers, vehicles and supplies the very short distance (90-second trips) to and from Billy Bishop Toronto City Airport on Toronto Island.

St. Catharines-based marine electrical engineering firm Canal Marine & Industrial Inc. (CANAL) was successful in proposing a 100% emissions free option, and it went on to deliver the complete electrification retrofit of the formerly diesel ferry, from conception to installation. The vessel, which was converted from diesel to fully electric during a 20-week refit at Toronto Drydock, returned to service in December and is now operating 100% emissions free.

Originally built by Hike Metal Products in Wheatley, Ont., and in operation since 2010, Marilyn Bell I was previously upgraded to run on biodiesel fuel in 2018 before its diesel generators and engines were removed in 2021 to make way for a new electric power and propulsion system and a suite of lithium-ion batteries. The project's naval architect is Quebec-based Concept Naval, and PortsToronto also engaged Nova Scotia-based E.Y.E marine consultants to assist with the implementation. Now fueled by 100% Bullfrog Power renewable sourced energy, the ferry emits zero greenhouse gas (GHG) emissions, reducing the airport's direct GHG emissions by 530 metric tons per year, according to PortsToronto.

The project involved the complete transition of the Marilyn Bell I to CANAL's ZEROe Power and Propulsion Solution. "In the vessel itself, we replaced the main engines with two 250kw electric induction motors basically mounted in the same location as the original engines," said Shawn Balding, CANAL's general manager and project manager for the Marilyn Bell refit, adding that Allied Marine & Industrial assisted with mounting the propulsion motors, alignment of the shafts and fitting of the Vulkan couplings attached to the existing shaft lines. The vessel's existing azimuthing pod thrusters also remained.

Balding said CANAL designed and manufactured the DC lineups. "It's a split-bus system where we have a separate power and propulsion system for the forward thruster and a separate power propulsion system for the aft thruster," he explained. "Essentially, each DC lineup, both forward and aft, has on it a grid converter for creating the AC bus to support the ship service loads. It contains the propulsion VSD to operate the propulsion motor. And, it contains two DC-DCs, each connected to separate batteries within a battery string, and the batteries were provided by Corvus and their Orca batteries. There is 113-kilowatt-hours per battery room, and there is a battery room in each of the forward and aft thruster holds."

Drawing from the retrofitted 226 kWh Corvus Orca Energy ESS, the new power and propulsion system supports the ferry's existing operations, carrying up to 15 reg-

ular-sized vehicles and 200 passengers at a time seven days a week, 19 hours a day, and four round trips (122 meters each way) every hour.

Another key part of the project was the CANAL Automatic Shore Charging System (ASCS), said to be the first automatic charging solution for an electric vessel in North America. The innovative design allows the tower on the dock to be raised and lowered according to the height of the lake, which changes with the ebb and flow of rains and snowmelt, Balding said. Battery charging automatically initiates when connected to the ramp on the mainland side and takes only five minutes during loading to top up the charge. MultiTech produced the tower, and the PANTO charger is from Stemmann-Technik.

As is the case here in the U.S., vessel electrification technology is a step ahead of Canadian vessel regulations, and Balding said navigating this proved to be a challenge alongside COVID-19 and related supply chain and pricing issues as well as having to switch recognized organizations (RO)—the delegated inspection authority appointed on behalf of Transport Canada— as the project was already in motion. "It's definitely a challenging environment. In the end, though, I would say it went very smoothly," Balding said.

And while many hybrid- and full-electric vessel newbuild and conversion projects include financial assistance from some government entity, this wasn't the case for the Marilyn Bell. In total, the ferry conversion cost approximately $3.8 million, paid in full by PortsToronto through the Airport Improvement Fee.

The HMI in the wheelhouse while the vessel is charging.

CANAL

"PortsToronto has made continuous and significant investment to make Billy Bishop Toronto City Airport cleaner, greener and quieter in an effort to create balance between our commercial operations and the surrounding community," Geoffrey Wilson, PortsToronto CEO, said in a statement. "With the conversion of the Marilyn Bell to electric power we are ticking all of the boxes in our vision for this airport and its operations. In removing all fuel components of the Marilyn Bell and replacing with lithium-ion batteries we will eliminate all GHG emissions related to the operation of the ferry – Clean. We will power these lithium-ion batteries with 100% Bullfrog Power – Green. And we will significantly reduce the noise associated with ferry operations – Quiet."

Looking forward

Increasingly, hybrid- and all-electric propulsion solutions are gaining interest and being put to use in the maritime sector, especially for vessels like ferries and other workboats that operate on fixed routes and schedules with frequent and relatively short trips and docking times.

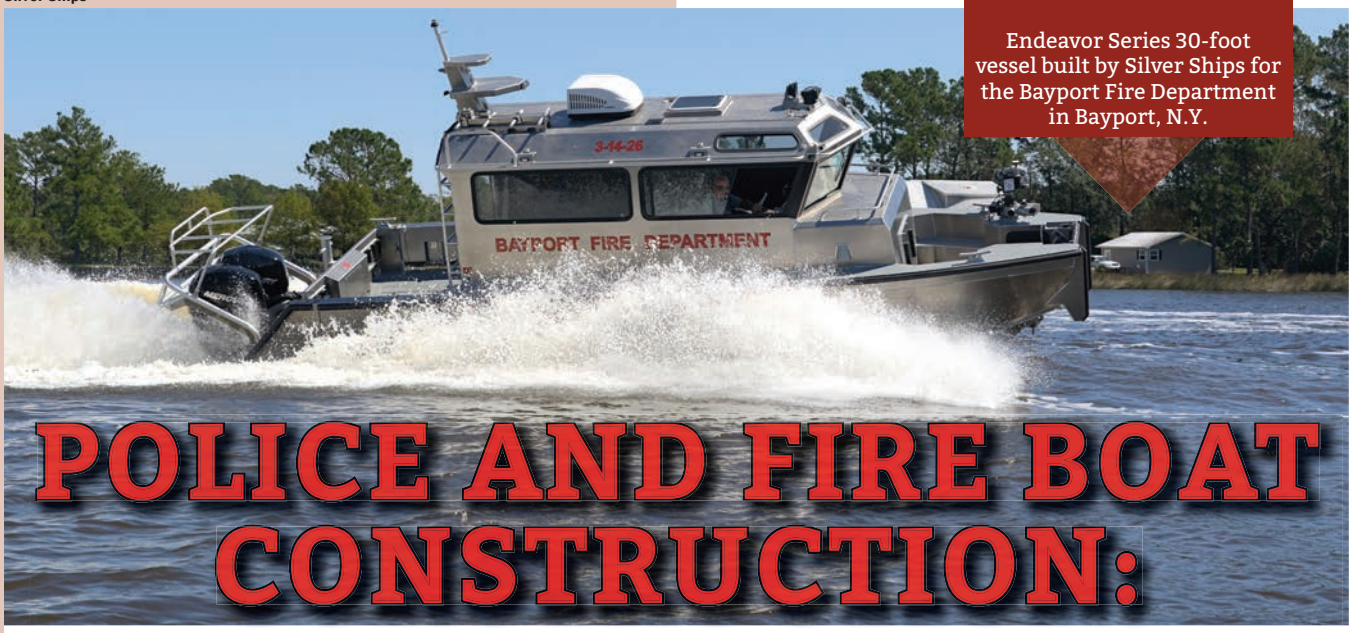
When asked about this trend and the possible future for vessel electrification projects, Balding said, "I think people have to take the approach that we took here for the Marilyn Bell, which is to look at the system and see if zero emission makes sense. And, what factors into that is how much energy storage you are going to need on board to make the system viable, and what kind of charging time you're going to have.

"The ratio of ramp time to travel time for any route becomes a very significant indicator for the viability of a truly zero-emission route. Fortunately, this one worked out really well to where we were confident that we could deliver a solution that would work without any diesels on board."

CANAL is soon set to deliver another ZEROe project for Skagit County in Washington State with a newbuild on their Guemes Island route. In comparison to the Marilyn Bell I, this project will deliver over twice the propulsion power, three times the energy storage capacity, and will be equipped with a larger and more powerful Automatic Shore Charging System. The vessel will also have generator on board as a backup. "Because it's operating on the ocean, there's different weather factors that had to be accounted for, and it's a much longer run," Balding said. "Certainly, availability of the grid becomes a major factor, and they don't have a backup vessel to operate if there was a loss of power to the mainland supply."

As owners and operators continue to explore vessel electrification, Balding says he sees a number of opportunities for CANAL to get involved in future projects, including more conversion work as well as newbuilds in the United States. "We won [the Marilyn Bell] contract in competition against the industry's top OEMs," he said. "Working with trailblazing organizations like PortsToronto and Skagit County gives us the opportunity to continue adapting and scaling our technology to meet the varying needs of the marine industry."

Silver Ships



Endeavor Series 30-foot vessel built by Silver Ships for the Bayport Fire Department in Bayport, N.Y.

POLICE AND FIRE BOAT CONSTRUCTION:

Strong Demand with More Orders on the Horizon

By Eric Haun

Today, despite an abundance of market challenges and supply chain headaches, many of America's police and fire boat builders are in possession of the shipyard holy grail: a healthy backlog.

Dave Hunt, business development and project manager for Theodore, Ala. based Silver Ships said vessel orders from police and fire agencies have been on the rise and that the expectation is that this trend will continue. "Between vessels delivered and in production, we have seen a year over year increase steadily since 2017; particularly the last two years. We anticipate a strong growth in 2022 and beyond."

And it's a similar story for other yards across the U.S., from Metal Shark on the Gulf Coast to Moose Boats and North River Boats in the West, each of which has remained active building for police and fire agency customers.

RIBCRAFT USA in Marblehead, Mass. is a specialist builder of rigid-hulled inflatable boats (RHIB) from 15 to 41 feet, and about 30% of its business is police and fire boat builds, according to Matthew Velluto, the company's director of business development and marketing.

"We've seen strong demand with some good steady growth in the police and fire boat market. Based on our current backlog, we're looking to be where we were in 2021 again in 2022 with maybe a bit more growth," Velluto said. "It's a market that we expect will continue to grow. Order levels are as good as they've ever been, and we're in a good strong position, both in terms of current backlog, as well as demand and interest."

For RIBCRAFT, key demand drivers are its vessels' versatility, ease of use and rapid deployment capabilities, Velluto explained. "A lot of departments and agencies are looking for vessels that offer an ease of operation, are functional and simply enable them to do what they need to do. We've seen departments going from larger boats and scaling back to something that can get out on the water quickly and be easily operated by one or two operators, with the added benefit of lower maintenance and operational costs."

"Vermont State Police use our boats for everything from dive operations to patrol work, to border enforcement to special security operations," Velluto said, alluding to the boats' versatility. "RIBCRAFT is currently building boats for the California Fish and Wildlife to support their patrol operations, be it standalone shore-based operations, basic enforcement duties or for some of their fisheries enforcements and other enforcements where boats are used in tandem with some of their larger patrol craft."

Silver Ships has also been busy, and Hunt said the builder had more than 30 vessels either in production or delivered for law enforcement and emergency services ranging from the local and state to the federal level in 2021. "In spite of supply chain issues, we have managed to maintain a steady pace of production and consistently seek to optimize our integrated production schedule to accommodate the uncertainties that have arisen in 2020 and 2021 while continuing to deliver to our customers," he said.

Hunt said building to the specific demands of each project has been crucial. "Critical to our process is the understanding of each customer's unique needs. Law enforcement and first responders are not monolithic, so no single solution will provide a solution for all."

Hunt added that Silver Ships has seen "a notable shift" from the retrofit and use of fiberglass recreational vessels in law enforcement to the acquisition of purpose-built aluminum vessels. "Custom aluminum workboats offer departments the ability to have a vessel tailored to their existing operational mission profile and TTPs instead of having to adapt their procedures to a vessel that is ultimately designed for the recreational customer."

Among Silver Ships' recent notable deliveries, League City Fire and Rescue near Houston took delivery of an Endeavor 30 multi-mission fire and law enforcement vessel. "The vessel, designed to fulfill the needs of both law enforcement and fire/rescue was immediately put into service after rigorous training and was instrumental in supplying water to a land-based apparatus in response to a large condominium fire within months of its in service date," Hunt said. "Equipped with twin Suzuki propulsion and a Darley LSDE1000 direct mount fire pump, the vessel is both fast and extremely capable of flowing large amounts of water. The enhanced Raymarine electronics package with both a FLIR and sidescan provide critical capabilities during search and rescue missions."

In 2021, Metal Shark introduced the 38 Defiant NXT aluminum monohull pilothouse model based on its 38 Defiant platform. The first new vessel, Fire Boat 2, was delivered to Orange Beach Fire Rescue in Alabama.

Metal Shark

An Endeavor Series 30-foot all-hazards response boat built and delivered by Silver Ships to the League City Fire Department in League City, Texas.

Silver Ships

A RIBCRAFT 6.5 (21'5") used by the Louisa County Sheriff's Department in Louisa, Va. for marine patrol and enforcement on Lake Anna.

RIBCRAFT USA

DREDGING COMPANIES KEEPING A CLOSE EYE ON NEW INFRASTRUCTURE DOLLARS

By Tom Ewing

For dredging company executives, the recently passed $1.2 trillion federal Infrastructure Investment and Jobs Act (IIJA) sits like the proverbial Horn-o'-Plenty, ready to disgorge billions of federal dollars for maritime, port, harbor, coastal, inland waterways and flood projects, many of which will require dredging. This is a really big deal because this new money will go toward existing projects, work that's been on the books, so to speak, but, until now, couldn't be funded. Plus, experts expect development of a whole new book of business as dormant projects are updated and offered for sale.

Overall, IIJA provides $16.6 billion for waterways projects. That covers a lot of different work, paid for via a number of agencies: Army Corps of Engineers (ACE), Department of Transportation, Coast Guard, General Services Administration, and Department of Homeland Security. The big spending categories are shown in the table below:

Ports/Waterways

Funding Table:

PORTS-WATERWAYS	
$5,150,000,000	Army Corps of Engineers Construction
$4,000,000,000	Army Corps of Engineers Operations and Maintenance
$300,000,000	Army Corps of Engineers Mississippi River and Tributary
$100,000,000	Army Corps of Engineers General Expenses/Regulatory Needs
$2,250,000,000	DOT Port Infrastructure Development Program
$25,000,000	DOT Marine Highways Program
$429,000,000	U.S. Coast Guard Unfunded Priority Infrastructure
$3,850,000,000	GSA/CBP Land Ports of Entry Modernization and Construction
$400,000,000	Reduction in Truck Emissions at Ports
$912,000,000	Ferry Boat and Terminal Construction

Obviously, all of these projects will not require dredging, but, just as obviously, many will. (Note: IIJA information in this report is from a Summary released by Sen. Maria Cantwell, Wash.)

Dredging executives are taking a fine-toothed comb to the IIJA to uncover exactly where new opportunities will arise. One person told me that his team is holding their cards very close to avoid tipping-off competitors about new project possibilities.

One area in which new work is very likely is within the Army Corps' Operations and Maintenance funds. IIJA provides $4 billion, over three years, to pay for dredging Federal navigation projects and repairing damages to Corps projects caused by natural disasters. It's not hard to see, though, that dredging will be a necessary part of many projects in most of the funding categories listed above. Opportunities expand further when one considers the harbor and waterways trust fund requirements established just a year ago by WRDA 2020.

Richard Balzano is CEO & Executive Director of the Dredging Contractors of America, named to that spot in December 2020. Balzano has over 30 years of maritime and government experience, including a stint as MARAD Deputy Administrator.

His comments on new funding. "We do not know what the final numbers are yet and how the Corps plans to implement a strategy," he wrote in response to email questions. He added that "we will not know the real totals until an appropriations bill or BBB ("Build Back Better" HR 5376) gets passed."

With the Corps' budget set to double this year, Balzano said "the Corps and industry must continue to work together and treat the dredging program more as a national program." He said that District coordination is one way to make the best use of all resources. He said "the industry's massive private investment in recent years" means companies are ready to continue "our work with the Corps to increase efficiency and deliver better outcomes for the Corps, industry, America's waterways, and taxpayers."

Maxie McGuire is President, Callan Marine Ltd., based in Galveston. McGuire was asked to comment on how he thought new IIJA funding would impact the dredging industry. Callan's work includes federal navigation, beach restoration and private sector projects for ship/barge dock owners.

DCA

"The Corps and industry must continue to work together and treat the dredging program more as a national program."

- Richard Balzano,
CEO & Executive Director,
Dredging Contractors of America

Callan Marine

"This additional funding commitment gives us the confidence to invest in equipment for future projects and expanded work."

- Maxie McGuire,
President, Callan Marine

In June, Callan Marine released the tender package for construction a new trailer suction hopper dredge. At 422 feet long and with a hopper capacity of 16,000 cubic yards, the Admiral Nimitz will be the nation's largest capacity trailing suction hopper dredge.

Callan Marine

McGuire said that "indications are that the funding stream will continue at a record pace for several years. This additional funding commitment gives us the confidence to invest in equipment for future projects and expanded work."

Callan will add two new vessels in 2022: the 422-foot long Admiral Nimitz, a trailer suction hopper dredge, the largest in the U.S., according to Callan and a new cutter suction dredge named the General Marshall.

William Hanson is Senior VP, Government Relations/ Market Development, with Great Lakes Dredge and Dock Company LLC, based in Houston. GLDD provides a broad range of dredging services, from ports and harbors work to restoration projects, nationally and internationally.

Hanson commented that "the IIJA is a long overdue investment in U.S. infrastructure that provides significant funding for a broad range of infrastructure projects many of which involve dredging." He called expanded funding "good news." He added that "the next challenge will be working with the Corps to identify their project list and get the projects in the marketplace and completed. We at GLDD are among the many U.S. companies who have added significant dredge capacity in recent years and have more dredges already under construction. So, this work is much needed."

For industry observers the notion of timing deserves closer focus. The sense is that three important and beneficial forces are in confluence. Consider: first, the expanded funding. Second, the money is becoming available just when new dredging vessels – trailing suction hoppers, clamshells, scows, cutters – are coming into service, the result of capital reinvestment programs that started five to seven years ago among many companies, not just one or two. Timely and consistent Congressional funding is also attracting new players, ensuring that a Jones Act compliant fleet can meet demand. Third, recent federal policy changes pertaining to streamlining and permitting will facilitate and complement the momentum from more money and new equipment. Taken together, these three factors portend big impacts on America's ports and waterways.

With dredging, many parts have to align before any work in the water actually starts. One California dredging exec commented that "we are sometimes at the dumb end of the stick, starting work after a whole lot of preparatory steps have already been completed." It's not unusual that preparatory work – getting a land-side disposal permit, for example, or waiting for a beneficial use partner to secure funding – can take longer than the actual dredging.

Now, looking ahead, more funding means that to the extent that budgets caused delays, that will start to change, for the better. Project timetables should quicken. Work among stakeholders will progress more predictably as schedules shift from wobbly to dependable.

Beneficial use (BU) is an example of a component likely to benefit from expanded funding. With dredging, BU is a holy grail kind of concept – the notion that dredged material can have a higher value than just waste. (BU is important to Congress, too. WRDA 2020 requires 35 BU dem-

onstration projects by the Army Corps.) ACE has made significant strides in changing the way the use of dredged material is perceived and programmed.

With more money project partners can commit the time and resources necessary to connect the dots, the complex dots, required to include BU within a project. Expanded funding will allow planners to avoid tight-fisted budgeting, where only immediate needs get attention. In the past, insufficient funding forced Corps Districts to make short-term decisions or wait until they confronted an actual emergency before committing project funds. This had unintended consequences that would often domino through an entire mission, resulting in hazards to shipping and disrupting other scheduled work, regionally and nationally. New resources and contracting methods will allow better planning and allow the Corps to complete work more efficiently and at lower costs.

More money gives the Corps some breathing room regarding just meeting the "federal standard" for dumping, i.e., the cheapest option that still meets environmental regs, usually dumping at sea, can start to change. New resources will allow time, for example, for sediment matching or the longer scheduling required to secure land-side permits or seasonal or wildlife demands; importantly, more money could cover material transport costs, usually significantly higher when taking dredge to a BU site. Greater resources means that agencies with different missions do not have to remain quite so siloed, that expectations can expand.

There is game-changer potential if projects shift from a narrow, single-site focus, to broaden in scope and impact.

Rather than an end point defined by budget limits, say, to pay for one component, e.g., dredging, new resources can mean that a project is declared finished because it included dredging and material reuse and barrier construction and beach restoration, or whatever the particulars are that define success within a waterway, not just because one task was completed.

The California dredging exec referenced above predicts additional benefits. It's his sense that project scope will expand as will the number of projects. For example, the ACE is responsible for maintaining federally authorized channel depth and width. Frequently, restricted funding results in an endpoint that, yes, keeps a channel functional as required, but with a kind of temporary reality. If more money were available the project could have been done right, completed to proper depth and width. Then, resources could shift to new projects; the pie gets bigger.

This assessment predicts IIJA will (1) provide 100% of funding for the Corps' listed set of projects; (2) money will be available for projects that are otherwise queued up but, say, their benefit/cost ratio was judged too low to qualify for funding and (3) local, relatively small projects will be reassessed; many of these projects are shovel ready, they just need federal dollars.

Employment is a critical issue here, something that aligns with the Biden administration's emphasis on "good paying U.S. jobs" and helping economically disadvantaged areas, giving various locations a second chance. Post industrial waterfronts, for example, could be a new focal point, sites requiring dredging to allow new development.

Finally, offshore wind is a giant issue opening new demands for dredging. Discussions are ongoing now between dredgers and wind energy companies. New work includes seafloor preparation, turbine foundation, trenching and even landside work to prepare sites for the vast space required for turbine assembly. IIJA provides $65 billion for projects related to power and the electric grid. Offshore wind will get some of that.

With IIJA, of course, there are hundreds of steps and decisions still to come regarding actual expenditures of money. That process, and final sums, are hard to predict, developments that will emerge as the federal budget process starts first quarter 2022. Nevertheless, for the dredging industry, looking ahead, the starting numbers are impressive.

GLDD

"The IIJA is a long overdue investment in U.S. infrastructure that provides significant funding for a broad range of infrastructure projects many of which involve dredging."

- William Hanson,
Senior VP, Government Relations/ Market Development, Great Lakes Dredge and Dock Company

Kongsberg Digital

Kongsberg Brings Training from the Cloud

The shipping industry is facing a significant competence and capacity gap in the years to come with more advanced instrumentation, ships becoming more complex to operate, new regulations and requirements to fuel-types and sustainable operations. We also see that due to the pandemic there are challenges for seafarers travelling to training centers to keep their certificates current and many experienced seafarers are changing profession. The need for retraining and advanced training of crew in all vessel segments is therefore becoming increasingly important, together with the ability to be more flexible in training methods.

In the face of this rapidly changing environment Kongsberg Digital (KDI) has developed a suite of online simulation solutions provided as a subscription-based service through the digital platform, K-Sim Connect. The training applications are bringing dynamic simulation scenarios to engage seafarers in situations they may encounter during their work at sea. And this highly realistic, time- and cost-efficient learning can be done without travelling to a training center at a specific time, but simply done anywhere in the world, at any time of day and at their own pace.

Early adoption

The benefits offered by K-Sim Connect has already been recognized by maritime schools and universities educating the next generation seafarers. Many lecturers have now started using the K-Sim Connect applications as part of the new "blended learning" philosophy, which combines the best of two worlds when it comes to teaching methodology. While the value and importance of face-to-face interactions with tutors and fellow pupils cannot be underestimated, the benefits of reinforcing classroom-based lessons with online self-study training, accessible anywhere and anytime, speak for themselves. Students being able to prepare for, undertake and repeat exercises, on their own computers and at their own pace, can make an enormous difference in achieving learning outcomes.

Another distinct advantage of Kongsberg Digital's cloud-based simulation solutions is that instructors can easily assess the student's score from the exercise and review the recordings of the actions taken to see what decisions were made and alternatively where it went wrong. In addition, the instructor can draw from a library of models and exercise areas to assemble,

Kongsberg Digital

distribute and grade their own bespoke exercises, which can be instantly accessible to their students or even shared with other institutes in the K-Sim Connect online community.

Integrating with e-learning institutions

The benefits offered by K-Sim Connect is also picked up by maritime e-learning providers and developed into their own training schedules. Recently, the Northeast Maritime Institute (NMI) based in Massachusetts, signed a partner agreement with KDI for delivery of a range of K-Sim Connect cloud-based simulation applications for NMI online students.

NMI has created a dynamic learning management system which delivers a wide range of courses online, reaching mariners across the globe. This comprehensive online maritime education, training, examination and certification portal is known as Northeast Maritime Online (NEMO). NEMO has emerged as a transformative model for maritime education and training and is a strong partner for KDI's K-Sim Connect simulation applications. NMI will utilize Kongsberg Digital's cloud-based simulation solutions as an embedded part of their e-learning courses.

Supporting technology and standards

KDI's cloud-based simulation application library currently includes engine room management, cargo handling, radar, ECDIS and route planning simulation solutions and will soon be extended with more applications in the navigation training domain. The applications are subscription-based, making them ideal for changing training needs and course programs, as training centers can select the ship- or engine models, sailing areas etc. that best suit their curriculums.

KDI's cloud simulation solutions became the first cloud-based simulators to be awarded the new DNV Class D certification. This verifies that the solutions possess the necessary functionality to satisfy the compliance criteria for remote learning programs, facilitating education and retraining of today's and tomorrow's seafarers.

Hydrogen One

Elliott Bay Design Group

A first of its kind cleaner burning methanol-fueled towboat is set to hit the water in 2023 as the maritime industry continues to develop and implement new technologies for cleaner vessel operations.

The Hydrogen One is being developed by owner Maritime Partners in cooperation with naval architecture firm Elliott Bay Design Group and hardware suppliers e1 Marine and ABB.

Decarbonizing the towboat sector poses substantial challenges, particularly due to towboats' inherent size, space and weight limitations. Batteries are only suitable for operations on fixed routes where daily recharging is possible, and a towboat's limited storage capacity restricts the use of pressurized or cryogenically stored gases as fuels. There are also very few dockside facilities to load such marine fuels, which severely constrains a vessel's range and functionality.

Hydrogen One will be IMO 2030 compliant, and meet all requirements of the U.S. Coast Guard's Subchapter M regulations. The ship has been designed by Elliott Bay Design Group using proven, efficient technology throughout, from ABB's electrical power distribution and automation to e1 Marine's methanol-to-hydrogen fuel cell, and it will be able to perform at standard operational speeds for up to 550 miles before it needs to refuel.

Methanol is a common towboat cargo, and it is available in 88 of the world's top 100 ports. The Hydrogen One's use of e1 Marine's reformer technology generates hydrogen from methanol on-demand, which also makes it considerably safer than transferring and storing hydrogen directly, and the ship's crew will require minimal additional training to use the technology.

Clean Canaveral

Fincantieri Bay Shipbuilding

Sturgeon Bay, Wis. shipyard Fincantieri Bay Shipbuilding delivered the 340-ft. liquefied natural gas (LNG) bunkering barge, Clean Canaveral, to Polaris New Energy on December 3. Built as part of an articulated tug and barge unit (ATB), the 5,500 cubic meter capacity barge is the largest of its kind ever built in the U.S., and will soon be followed by another barge of similar size for an affiliate of Polaris New Energy.

Built for coastwise transportation of LNG and to deliver LNG as a clean maritime transportation fuel, the barge will be paired with a 4,000-hp Polaris tug fitted with a JAK-400 coupling system, being built at Master Boat Builders. Built to ABS class, the barge is fit with a cargo handling system designed and developed by Wärtsilä Gas Solutions

Fincantieri Bay Shipbuilding is under contract to build a sister 5,500 cubic meter ATB for Northstar and Polaris.

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Vessels

Spartan

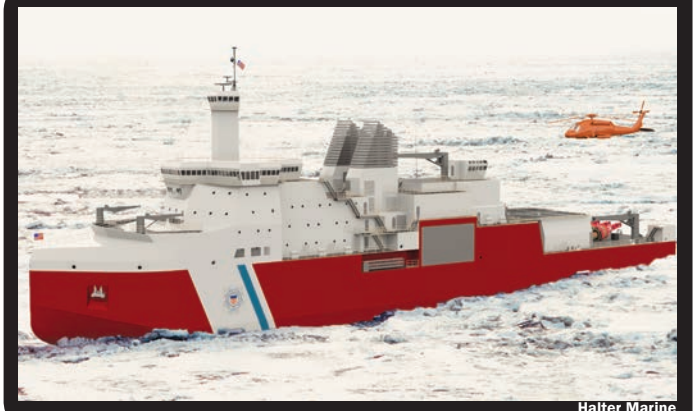
Master Boat Builders

Seabulk's new electric-hybrid tugboat Spartan was launched on November 1 at Master Boat Builders' Coden, Ala., shipyard.

Scheduled to be delivered in January 2022, the Robert Allan Ltd.-designed vessel has overall length of 98 feet, beam of 43 feet and bollard pull of 90 tons. The integrated hybrid propulsion system was provided by Thompson Tractor and includes two EPA Tier 4 certified Caterpillar 3512E main engines, each producing 2,550 horsepower and two Berg MTA 628 azimuth thrusters, three Caterpillar generators and two ABB propulsion motors and associated variable frequency drives.

The tug will be built to meet USCG regulations and will be classed through ABS, including escort notation.

Polar Security Cutter


Halter Marine

Pascagoula, Miss. shipbuilder Halter Marine has been awarded a contract to build a second U.S. Coast Guard Polar Security Cutter, the Pentagon announced. The $552.7 million detail design and construction contract follows a $745.9 million contract awarded in 2019 to build the first PSC. There is also an option for a third PSC.

The Polar Security Cutter program is planned to replace the Coast Guard's existing fleet of icebreakers. The new fleet will allow the USCG to perform missions in the Arctic region, including defense and readiness operations, research assignments, search, rescue and logistic support and vessel escort.

Halter Marine is teamed with Technology Associates, Inc., (TAI), as the ship designer. The design of the new PSC is based on that of the German polar research and supply icebreaker Polarstern II. The vessels have an overall length of 460 feet and an overall beam of 88 feet. Each will have a full load displacement of approximately 22,000 long tons. The propulsion will be diesel electric at over 45,200 horsepower, making it capable of breaking ice between six and eight feet thick. The icebreaker will accommodate 186 personnel comfortably for an extended endurance of 90 days.

In addition to TAI, Halter Marine has teamed with ABB for its Azipod propulsion and Trident Marine for its power distribution system, Raytheon for command and control systems integration, Caterpillar for the main engines, Jamestown Metal Marine for joiner package, and Bronswerk Marine for the HVAC system.

Construction on the first PSC kicked off this year with delivery planned for 2024. Work on the second vessel is expected to be completed by September 2026.

INTERNATIONAL WIND TURBINE & FOUNDATION INSTALLATION VESSEL MARKET FORECAST

The new report from World Energy Reports - brings you all the data and analysis you need to get a foothold in this growing market!

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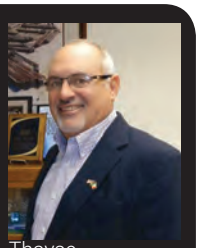
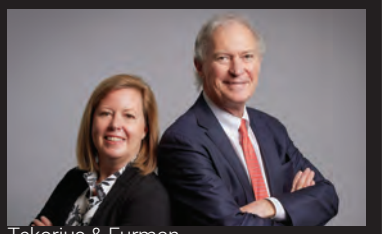
People & Companies


Perciavalle


Thayse


Paul


Martecchini


Tekorius & Furman


Jovel


Klaver


Mulherin


Headley


Benken


Lacey

Leadership Change at Bay Shipbuilding

Craig Perciavalle has been appointed as vice president and general manager of Fincantieri Bay Shipbuilding, replacing Todd Thayse, who decided to retire. Thayse will have an advisory role within Fincantieri Marine Group, the corporate entity that oversees FBS.

Maine Maritime Names New President

Jerald S. "Jerry" Paul has been named Maine Maritime Academy's next president, succeeding William J. Brennan, who steps down at the end of April.

Martecchini to Lead Webb

Mark Martecchini has been selected to become president of Webb Institute. He will succeed R. Keith Michel effective July 1.

Greenbrier Announces CEO Transition

The Greenbrier Companies, Inc. president and COO, Lorie Tekorius, has been appointed as the company's next CEO and president, effective March 1. On the same date, Greenbrier's co-founder, chairman and CEO William A. Furman will assume the newly created role of executive chair until his retirement. Furman will retire from all executive offices in September 2022. His current board term continues until January 2024.

Vard Marine Inc. Promotes Jovel

Kristin Jovel has been promoted to the position of vice president business operations for Vard Marine Inc.'s North American offices.

Royal IHC Names Klaver CEO

Jan Pieter Klaver started as CEO of Royal IHC on January 1, taking over from Gerben Eggink, who fulfilled the role of CEO on an interim basis for more than a year and a half.

Newport News Promotes Mulherin

Matt Mulherin Jr. has been promoted to vice president of contracts at its Newport News Shipbuilding division. Mulherin succeeds Christie Thomas, who has been appointed corporate vice president, investor relations.

Parker Towing Promotes Three

Parker Towing announced it has promoted three employees. Jeremy Headley has been promoted to director of sales, Dan Benken has been promoted to director of port and barge line services, and Leif Lacey has been promoted to ports and terminals sales manager.

TOTE Announces Leadership Changes

Mike Noone, president of TOTE Maritime Puerto Rico, has been promoted to a new role as the company's chief operating officer for TOTE Group. Kevin D. Kendrick was named the new president of TOTE Maritime Puerto Rico and Alex Hofeling was named president of TOTE Maritime Alaska.

Products

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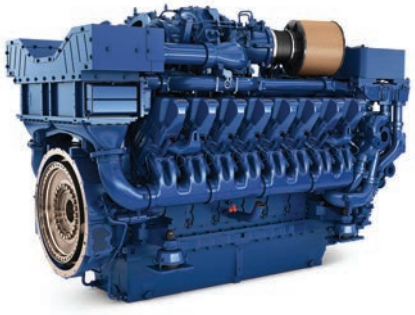

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3. Hydrogen-based Propulsion

Norway's Kongsberg has announced "a world first" by testing and verifying a full-scale, full-size, zero-emissions drivetrain powered by hydrogen fuel cells designed for ships and ferries. The project demonstrates that the technology is now mature for using hydrogen (H2) as an energy carrier, Kongsberg said. The program is the third and final part of the EU-funded project "HySeas" which has been running since 2013 to prepare and demonstrate a scalable hydrogen system for ships and ferries. In this final stage, Kongsberg has built a full-scale electric propulsion system based on hydrogen-powered fuel cells at Ågotnes outside Bergen. The system will now undertake a four-month testing program for validation purposes with the aim of verifying the final design for an H2-powered RoPax ferry.

4. mtu Series 4000 Engines

The latest generation of mtu Series 4000 commercial marine engines for tugs, ferries and workboats will boast significantly extended engine running times of up to 96,000 hours between overhauls (TBO), according to manufacturer Rolls-Royce. In general, all marine engines of the latest generation of mtu Series 4000 can now run for up to 25 years before they need a major overhaul, depending on the duration and intensity of use, Rolls-Royce said. That is seven years more between overhauls than previously recommended. The new TBO intervals and maintenance schedules, which apply to new engines of the type 4000 M05, are made possible with the help of Big Data analysis of tens of thousands of real engine data sets, which enables Rolls-Royce to accurately predict engine and component running times, the company said.

Marine News 2022 Editorial Calendar

January 2022

Workboat Propulsion

- Passenger Vessels
- Distance Learning: Remote Classroom, Simulation, Online Training
- Police & Fireboats
- Pipes, Pumps & Valves

E-Magazine Edition:

U.S. Offshore Wind: The Growth of an Industry

March 2022

Pushboats, Tugs & Barges

- Shipbuilding Report
- Coatings & Corrosion Control
- ECDIS, Radar & Navigation Equipment
- Fluid Handling Pumps and Filtration
- Spotlight: Q1 Inland Waterways Report

April 2022

Offshore Energy

- Vessel Repair & Conversion
- Rope & Cordage
- Marine Cranes
- Marine Electronics: Communication & Controls
- Heavy Lifters: Deck Machinery & Cranes

Event Distribution:
OTC: May 2-5, Houston, TX
IPF: April 26-28, Atlantic City, NJ

May 2022

Dredging

- Barges
- Material Handling Equipment
- Maritime Training & Education
- Spotlight Q2: Inland Waterways Report

Event Distribution:
Inland Marine Expo: May 23 - 25, St Louis, MO

June 2022

Combat & Patrol Craft

- Multi-mission Workboats
- Patrol Craft Propulsion : Inboard, Outboard and Water Jets
- Marine Lighting
- Workboat Communications

Event Distribution:
MACC: Jul 2022, National Arbor, MD
Seawork: June 21-23, Southampton, UK

July 2022

Propulsion Technology

- Autonomous Vessels
- Workboat Engines
- Water Treatment
- Fuels & Lubricants

E-Magazine Edition:

Inland Waterways: Operations, Expansion & Dredging

September 2022

Shipbuilding & Repair

- Naval Architecture/Marine Engineering
- Barge Loading & Unloading Equipment
- HVAC
- Spotlight: Q3 Inland Waterways Report

Event Distribution:
SMM: September 6-9 Hamburg, Germany
SNAME Expo: October

October 2022

MN100

- Offshore Wind
- U.S. Shipyards
- Inland Waterways
- Health & Safety

November 2022

Great Workboats of 2022

- TBest New Tech
- Power & Propulsion
- Deck Machinery
- Spotlight: Q4 Inland Waterways Report

Event Distribution:
Clean Gulf: December 2022
Workboat Show: December 2022

E-Magazine Edition:

Patrol, Escort & Fast Craft Operations

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NEW PRODUCTS

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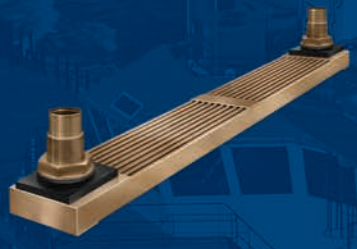

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