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Volume 32 • Number 11

Marine News

NOVEMBER 2021

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On the Cover

Sea Change, built by All American Marine for SWITCH Maritime, is the U.S.' first zero-emissions, hydrogen fuel cell-powered, electric-drive ferry.
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Editor's Note

Eric Haun, Editor,
haun@marinelink.com

The global maritime industry is currently navigating a whirlwind of major, meaningful change unlike any other in recent history. Vessel owners and the full spectrum of companies that support their operations are grappling with new and stricter regulatory demands, ambitious environmental targets and rapidly evolving technological innovations—all emerging on top of a shifting business landscape. It's certainly a lot to deal with. However, intertwined with the inherent challenges of this type of change are significant opportunities to improve safety, efficiency and the bottom line.

One example of this is vessel electrification, which has been gaining interest as a viable option for certain vessel types and applications as the required enabling technologies continue to advance. Owners striving to decarbonize are leading a raft of hybrid- and fully-electric vessel projects popping up in U.S. rivers, waterways and harbors, as highlighted in this issue starting on page 42.

This edition also contains *Marine News*' top boats of 2021. In my personal, unbiased opinion, the list starting on page 50 is quite impressive. A passenger ferry powered by hydrogen fuel cells, the largest pilot boat ever constructed in this country and a high-tech tugboat with autonomous capabilities; these are just a few that are included. But, if you feel there are vessels we may have overlooked, I'd be happy to hear from you. Feel free to send me an email at haun@marinelink.com.

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5


6

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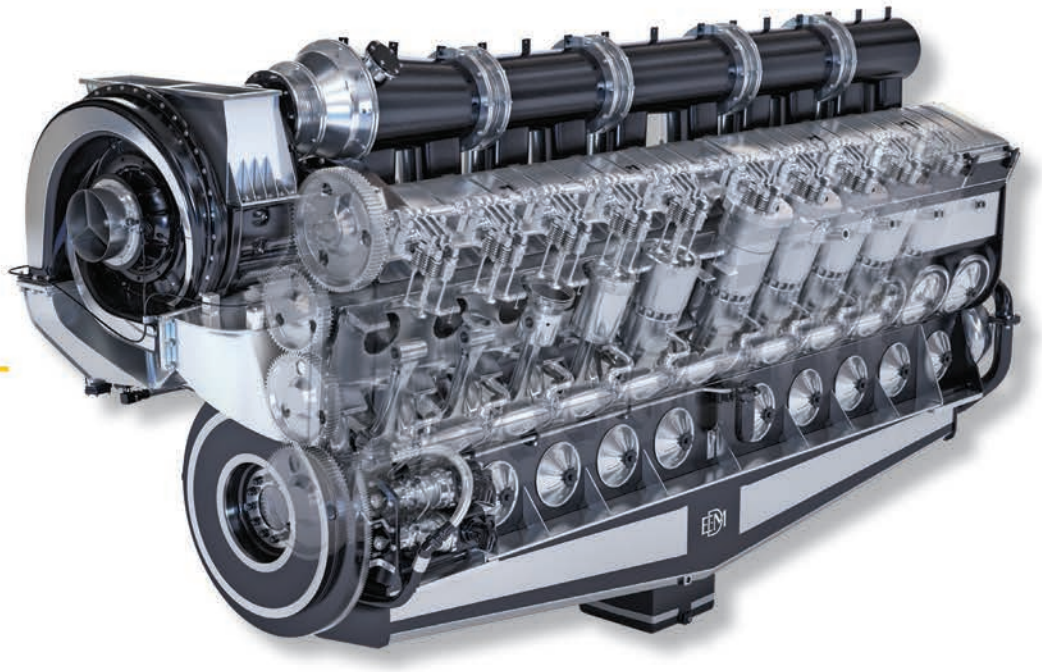

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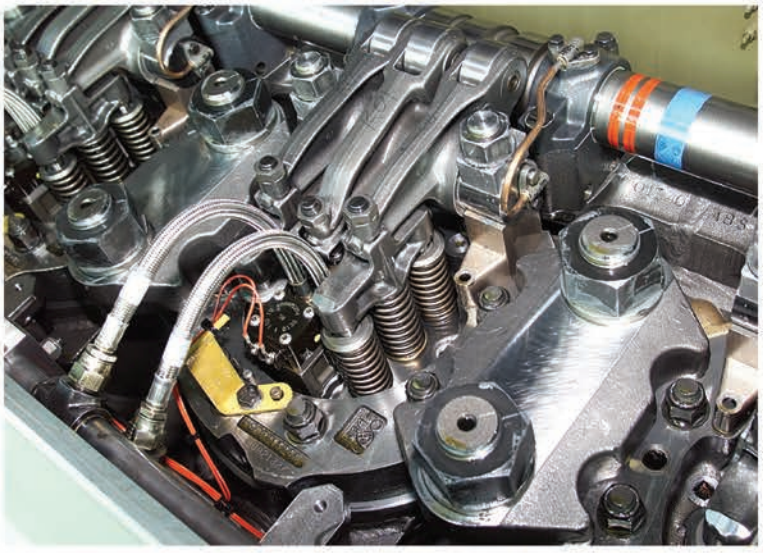

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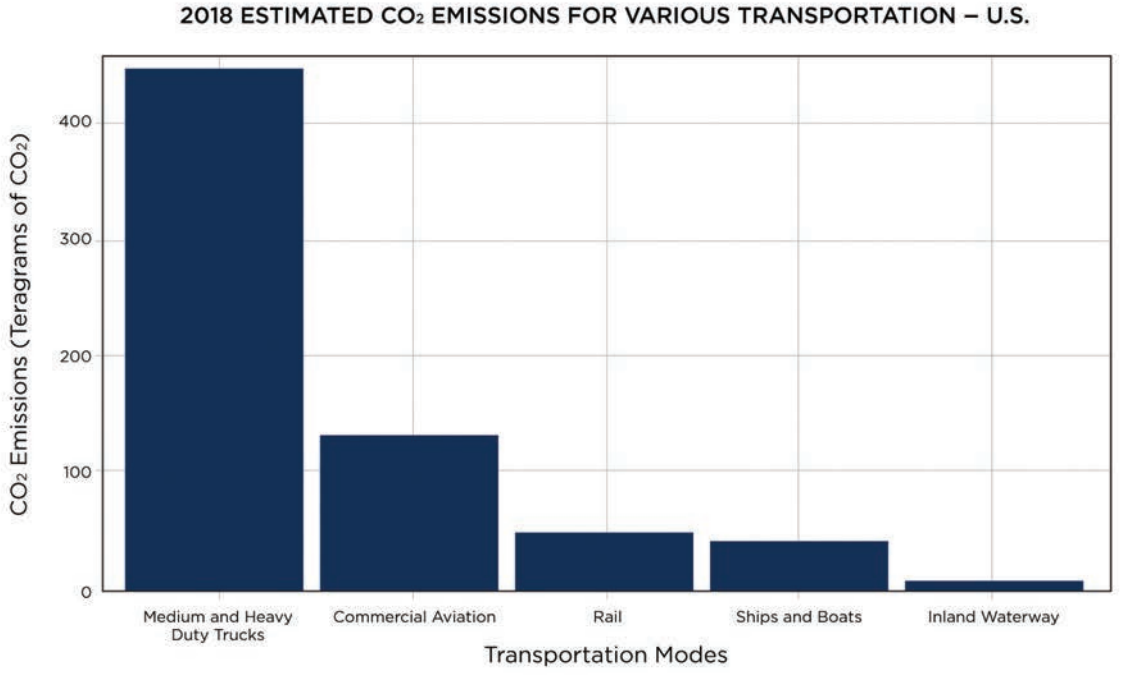
By the Numbers

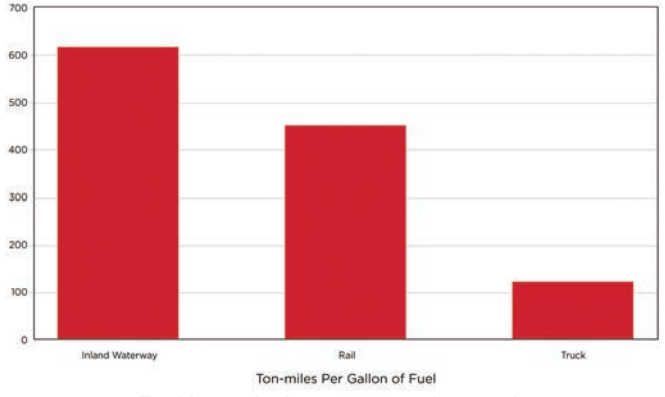
Inland Waterways Decarbonization

For many years, ocean shipping has been for among global industries focused on decarbonization, but emissions reduction initiatives in U.S. inland waterways shipping are not as far along. And while it's well known that inland waterway barge transport, through economy of scale, is vastly cleaner than road, rail and air options, there are still green opportunities on the table.

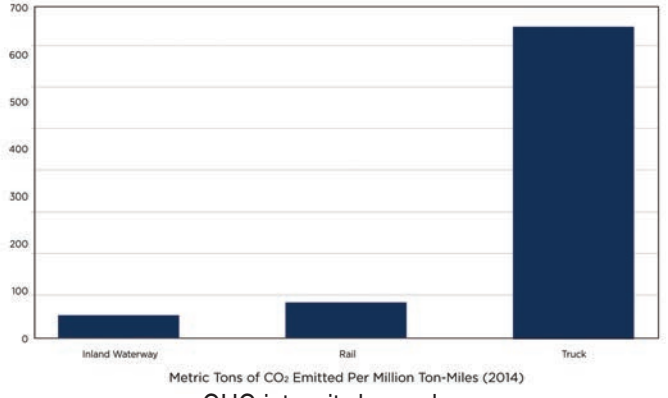
ABS in September published a report prepared for the classification society by Vanderbilt University, "Decarbonization of the Inland Waterway Sector in the United States", identifying challenges and opportunities that will be faced in moving toward a carbon neutral and zero-carbon future on the inland waterways, while also including prospects for furthering the sustainability advantages that barge transport has relative to other surface transportation modes.



GHG emissions modal comparison. Commercial Aviation does not include passenger air traffic. Ships and Boats category may include some inland waterway. Data for inland waterways was calculated as part of this project; data for other modes was obtained from EPA's annual GHG inventory.



Fuel intensity by transportation mode.
Source: Texas Transportation Institute (2017)



GHG intensity by mode.
Source: Texas Transportation Institute (2017)

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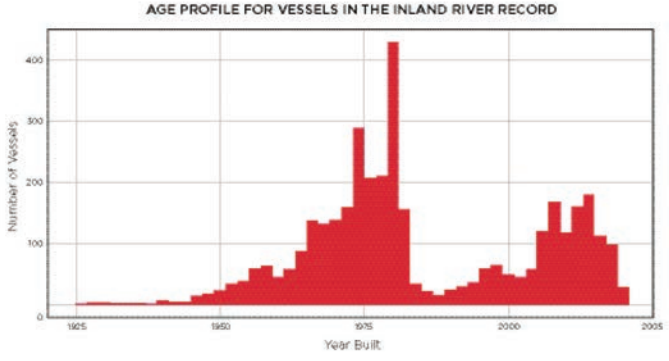
By the Numbers

A key consideration in the decarbonization equation is the fleet age profile of the U.S. inland waterways towboat fleet. The majority of towboats working on America's rivers today were built during a 20-year period from 1970 to 1990, both to replace older, smaller equipment constructed prior to the completion of the waterway network, and to account for the rapid growth in tonnage that took place beginning in the 1970s. A well maintained towboat has an indefinite useful life, and the average age of the U.S. inland towboat fleet is 36 years (many are over 50 years old), compared to 13 years for the world merchant fleet.

Towboats long lifespan plays a big part in the development of decarbonization strategies as operators are incentivized to repower and upgrade propulsion and other systems over the years rather than retire older vessels outright. It's also worth noting that inland marine engines also have long life spans, and it is not uncommon to find the same engine in a towboat operating for more than 40 years, delaying (nearly indefinitely) shifts to lower-emitting newer engines that have only been required by regulation when an older engine is replaced. At the same time, constructing new boats that could be designed to accommodate particular propulsion technologies where retrofitting is difficult or impossible is not likely to occur.

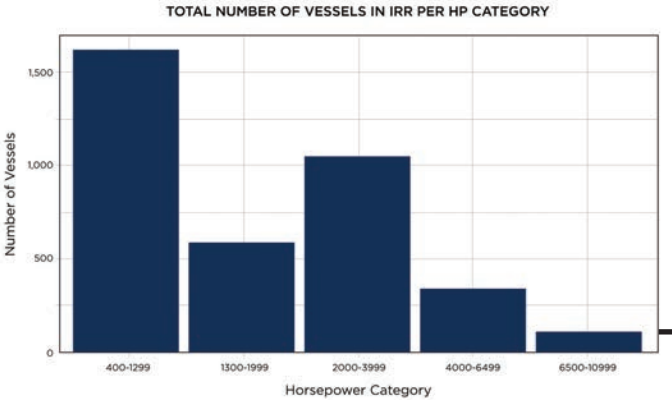
Another important factor is the horsepower categories of inland boats. For example, smaller horsepower fleet boats could be retrofitted to electric propulsion systems, but the larger horsepower boats cannot – the size of the batteries needed (with current technology) to provide the required power and range before recharging cannot be presently accommodated while maintaining boat buoyancy. However, because a significant number of the industry vessels are in the lower horsepower range, electrifying only the fleet boats is estimated to reduce total industry fuel burn by approximately 100 million gallons annually, a substantial overall emissions reduction (approximately 20% of overall inland industry GHG emissions).



Source: Inland River Record

Vessel Horsepower Category	Approximate Annual Fuel Range (Gallons)
400-1299	75,000 - 125,000
1300-1999	150,000 - 275,000
2000- 3999	325,000-450,000
4000-6499	425,000 - 650,000
6500-10999	650,000 - 1,900,000

Approximate annual fuel consumption ranges per vessel horsepower category (courtesy of Ingram Barge Company). Annual average fuel consumption can vary substantially depending on vessel operating days. This figure is intended only to provide general, approximate values. Figures rounded to nearest 25,000



Industry fleet profile: Total number of vessels (as identified in the Inland River Record dataset) in relevant horsepower classes

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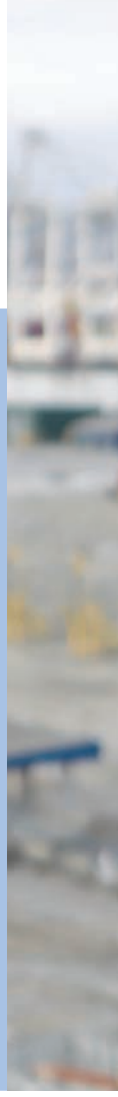

All images: Foss Maritime

Will Roberts joined Seattle-based Foss Maritime in 2017 as chief commercial officer, and in 2018 he was named chief operating officer. Prior to joining Foss, Roberts held a number of leadership roles for marine systems and services provider Rolls-Royce, rising to senior vice president, customer and services–Americas. A U.S. Navy veteran, Roberts served as a qualified deck and engineering officer aboard the fast attack submarine USS Honolulu. He graduated from the U.S. Naval Academy with a degree in ocean engineering and holds a Master of Engineering Management from Old Dominion University. Most recently, Roberts completed a course of study at the Tuck School of Business at Dartmouth College and is currently enrolled in a course of study at the Foster School of Business at the University of Washington.

Please give a 'by the numbers' overview of the Foss Maritime fleet and areas of operation.

WR: Foss Maritime operates a diverse fleet of vessels that support offshore towing operations as well as inland harbor services. Foss operates on a global scale with local operations support on the U.S. West Coast, U.S. East Coast, Gulf of Mexico, Hawaii and Alaska. Our primary ports, in which we provide harbor services, are Southern California (L.A./Long Beach), Northern California (SF Bay), Oregon (Columbia/Snake River) and Washington (Puget Sound). The fleet consists of more than 75 vessels and barges, supported by over 300 professional mariners.

Do you plan to grow the fleet or perhaps replace aging assets?

WR: Foss continually seeks opportunities to expand our fleet and operations. Currently, Foss is pursuing opportunities within the offshore wind sector as well as growing the business with our existing customer base. Fleet growth is best when it dovetails into our strategic planning. Fleet replacement is a must. Foss most recently placed three state-of-the-art ASD 90 Z-drive harbor assist/escort tugs into the California fleet. Foss is fully committed to upgrading our current fleet in support of reducing our carbon footprint as well as meeting the demands of our customers, who continue to grow in capacity.

How has Foss been impacted by the current shipping and supply chain issues, and what is the company doing in response?

WR: Foss is responding to the needs of our customers. The current supply chain crises has more to do with terminal space, trucks, chassis and warehouse workers than it has to do with the tugboats needed to dock ships. Our industry has plenty of capacity to dock the ships waiting to berth. Foss also has the additional ability and capacity to transit containers on barges (short sea shipping) between major port pinch points to secondary ports within a days' sailing. While not economically feasible in the past, with container rates from Asia increasing exponentially from where they were just 18 months ago, the consumer urgency may drive our customers to seek such an alternative solution.

Insights

Foss recently placed three state-of-the-art ASD 90 Z-drive harbor assist/ escort tugs into the California fleet.

Please give an update on Foss' autonomous harbor tug project. Why did the company decide to adopt this novel technology, and how do you see the risks and rewards?

WR: While we are not working on a fully autonomous tug, the systems that Sea Machines are building allow our crews to use autonomous features to make their jobs safer. Our mariners are the key to our success, and we believe the Sea Machines products will help them carry out their day to day operations. Our work toward integrating the autonomous controls into our new 90-ton ASD tug Rachael Allen continues with our partners at Sea Machines, the U.S. Coast Guard and ABS. As a safety enhancement that incorporates new and novel technology, we are testing out a tool to support our crews, which comes from a system processing digital information to enhance safety of navigation. We are excited about the tools this system brings to our mariners in their service of our customers. We will work closely with regulatory agencies and third-party auditors to thoroughly vet the system as we continue to move toward full operational use of the SM300 on board.

U.S. offshore wind is ramping up in a big way. What are Foss Maritime's goals as a participant in the emerging sector? Where do you see best opportunities for your company, and what is it doing to capitalize?

WR: Foss is thrilled that the offshore wind industry is coming to the shores of the United States. Since the Cape Wind project over a decade ago, Foss has worked to find solutions for proposed offshore wind projects. Vineyard Wind will be the first of such projects. And, as Vineyard Wind clears many development hurdles, we are excited to see the industry as a whole gaining momentum. As a comprehensive marine services provider, Foss excels in delivering safe, on-time, and on-budget marine transportation solutions. The U.S. offshore wind market offers new opportunities, and Foss intends to continue its track record of being a quality marine transportation and service provider.

Decarbonization is a hot topic in the maritime industry today. Is Foss Maritime currently looking at alternative fuels, electrification or other means to reduce the environmental footprint of its fleet? Please explain.

WR: Foss has always been proud of its commitment to protecting the environment. Foss has been focused on decarbonization and pollution reduction for years. We are willing to take the risks to test out new technology such as when we built and operated the world's first battery electric hybrid tug, the Carolyn Dorothy back in 2010. We then took it a step further and retrofitted a sister vessel, the Campbell Foss, to hybrid operation soon after. As a next step, recently, we put our class of EPA Tier IV 90-ton escort and assist vessels in to service in California and will continue to build with the cleanest technologies available for our operations.

Insights

Foss' new harbor tug Rachael Allen is equipped with high-tech Sea Machines systems that will help mariners perform their jobs safer and more efficiently.

Foss Maritime built and operated the world's first battery electric hybrid tug, the Carolyn Dorothy, in 2010.

Foss continues actively looking into alternative technologies and fuels, like the biofuel trial we have underway this year with our tug Alta June in the San Francisco Bay area. Fortunately, all of these technologies are constantly evolving and becoming more available. And, we definitely plan to integrate these new technologies into our fleet as we reinvest in and continue to improve our fleet.

What were your top goals when you took over as Foss Maritime president in January, and how have they evolved (if at all)?

WR: I am both proud and humbled to be president of one the premier towing companies with a worldwide reputation. Sadly, my top goal when I became president was to put Foss into the best position possible during the COVID pandemic. We focused on our employees and their families while still operating safely to support our customers and communities. We had great success in continuing operations, and now we can focus on our core business and our future business.

What have been your greatest challenges this year, and how did you tackle them?

WR: The greatest challenge, as you might expect, was the evolution of COVID. You can only tackle this challenge if you have a family that cares about each other and our customers. I am proud of how much our team support their shipmates, our customers and communities.

Column

Washington Watch

Feds Struggle to Address Supply Chain Capacity Issues

By Jeff R. Vogel, Partner, Cozen O'Connor's Transportation & Trade Group

The Biden Administration's struggles to alleviate supply chain capacity issues appear to be continuing with no end in sight. Part of the issue arises from the Administration's limited focus on ports and another part arises from Congressional stalemates. Could the much-needed beltway leadership on these issues come in the form of the newly-tapped Maritime Administrator?

Biden focuses on ports to address larger issues

Throughout October the President and his Supply Chain Disruptions Task Force – including Port Envoy (and former Deputy Secretary of Transportation) John Porcari – met with representatives from the Ports of Los Angeles and Long Beach and the International Longshore and Warehouse Union (ILWU) to discuss the supply chain capacity issues throughout Southern California. The result of these meetings, as laid in an October 13 White House Fact Sheet, was that the Port of Los Angeles agreed to expand to 24/7 operations, which would be supported by the marine terminal operators and the ILWU members at the port.

As a follow up to these discussions, President Biden met with shipper interests in an effort to obtain their commitment to use these expanded port hours. The White House Fact Sheet indicated that President Biden had obtained commitments (although some commitments were extremely vague) from Walmart, UPS, FedEx, Samsung, Home Depot and Target, to increase their use of off-peak hours to move additional containers from Port of Los Angeles' marine terminals.

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However, anyone involved in the U.S. maritime industry knows that a myopic focus on expanded port operations will have minimal impact on the present supply chain capacity issues. The entire U.S. logistics network – including marine terminals, equipment providers, trucking companies, rail operations and terminals, and warehousing – is operating at or above full capacity. Driver shortages continue to impact trucking, which unless immediately resolved, puts a cap on the amount of cargo that can be moved out of overloaded marine terminals. Accordingly, absent a sudden (and highly unlikely) reduction in U.S. consumer demand, a whole-of-network approach is the only way that there will be any easing of the U.S. supply chain capacity issues.

Despite capacity challenges, infrastructure bill stalls

One of the major challenges in adopting a whole-of-network approach has been the absence of a single Federal authority with oversight over all aspects of the U.S. intermodal transportation network. Transportation stakeholders were hopeful that the infrastructure bill would solve this issue through the creation of a new Office of Multimodal Freight Infrastructure and Policy (OMFIP) within the U.S. Department of Transportation (USDOT). If the infrastructure bill is ever enacted, the OMFIP would provide a cohesive intermodal planning authority that has been sorely missing within USDOT. The OMFIP would be headed by a new Assistant Secretary for Multimodal Freight who, among other responsibilities, would be charged with (1) overseeing certain multimodal freight grant programs within USDOT; (2) facilitating the sharing of information between the private and

Rear Adm. Ann Phillips USN (Ret.) has been tapped to lead the Maritime Administration (MARAD)

Photo: U.S. Navy

public sectors with respect to freight issues; (3) conducting and overseeing research by USDOT agencies on improving multimodal freight mobility; (4) assisting cities and States in developing freight mobility and supply chain expertise and (5) coordinating with other Federal departments and agencies. By creating a unified authority with oversight over the entire U.S. supply chain, the infrastructure bill could resolve the disconnected planning of Federal modal agencies that has contributed to the present capacity issues.

Notwithstanding the potential opportunity to create an office that could contribute to alleviating supply chain capacity issues, as of the time of writing the fate of the infrastructure bill remains unknown. Progressive Democrats have stated that they will not support the infrastructure bill until there is a deal on the larger $3.5 trillion reconciliation spending bill, which includes measures to address climate change, paid family and medical leave, Medicare expansion, and universal pre-K education. Numerous Republicans and some moderate Democrats view these provisions as "poison pills" leading to a continuing standoff on the both the infrastructure and reconciliation bills. This standoff led to a short-term extension of surface transportation funding through October 31, which kept large parts of USDOT open. However, the clock is ticking to reach a long-term deal to avoid a shutdown of many USDOT agencies, which would further exacerbate the supply chain capacity issues. Clearly strong leadership is needed within the beltway to over these issues.

Column
Washington Watch

Biden finally taps a Maritime Administrator

Thankfully, additional maritime leadership is on its way as President Biden finally nominated a Maritime Administrator after the longest delay of any modern administration. Biden has selected Rear Admiral Ann Phillips, USN (Ret.), to lead the Maritime Administration (MARAD), a distinguished Navy Surface Warfare Officer, who served on the Chief of Naval Operations' Staff as the Director of Surface Warfare (N86) prior to her retirement. Since retiring, Phillips has been focused on coastal resiliency and climate change issues, including in her current position as Special Assistant for Coastal Adaptation and Protection to Governor Ralph Northam of Virginia.

Phillips' environmental background clearly aligns with the Biden Administration's larger agenda, but her lack of any commercial maritime experience leaves many questions as to how her background will translate to serving as Maritime Administrator. Notwithstanding these questions, Phillips is viewed as a very capable leader within the beltway and her nomination appears to have bipartisan support. Accordingly, her nomination is expected to receive relatively quick Senate confirmation.

In addition to its role as the promotional agency for the U.S. maritime industry and U.S. Merchant Marine, MARAD is responsible for administering port-focused grant programs, including the Port Infrastructure Development Program. Once confirmed, Phillips will therefore play a key role in the Federal government's response to U.S. supply chain capacity issues. Phillips' challenges will not end there as she will be tasked with overseeing the forthcoming efforts to recapitalize MARAD's aging Ready Reserve Force fleet and addressing a myriad of challenges at the U.S. Merchant Marine Academy. I am confident that she will rise to the challenge and will be a strong advocate for U.S. maritime stakeholders.

Column

Offshore Wind

Maritime for the Win(d)

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

With the recent announcement by Secretary Deb Haaland that the Department of Interior will potentially hold up to seven new offshore lease sales by 2025, the Biden administration has taken a significant step toward its goal of bringing online 30 gigawatts of offshore wind energy by 2030. This development is the latest indicator that close collaboration now between America's offshore wind and maritime stakeholders holds the promise of lasting benefits for our nation's energy future.

The administration's ambitious "30 by 30" goal represents a generational opportunity for clean energy in the United States, for American jobs, and for the mutual success of offshore wind developers and the U.S. maritime

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Column
Offshore Wind

industry. Working together, offshore wind developers and U.S. maritime companies can seize this moment to create the next great American industry, sustained by a made-in-America supply chain that will help ensure the reliability of this emergent energy source for the long-term.

American maritime is ready, willing and able to produce the vessels that will be needed to service this market, and help create an environment that makes such investments viable. From historic investments in the first Jones Act-compliant wind turbine installation vessel, to special operations vessels, crew transfer vessels, feeder barges, and port and workforce development partnerships, American companies are already taking steps to build a solid foundation for moving offshore wind forward in the United States.

So how do we spur investment in the fleet of vessels that will be necessary to support all phases of the offshore wind project lifecycle—surveying and site preparation, development and construction, operations and maintenance, and eventual decommissioning?

There are four key steps that need to be taken to accelerate this process.

First, American offshore wind and maritime need to mutually understand and acknowledge the ground rules. In the case of offshore wind vessels, Congress has spoken—as recently as January 1—with legislation clarifying that the Constitution and all U.S. laws apply to renewable energy development on the Outer Continental Shelf. Crucially, "all U.S. laws" includes the Jones Act, which will help ensure that this energy source and the supply chain facilitating its delivery remains reliable and secure.

The applicability of the Jones Act should send a strong signal that delaying serious conversations with American maritime companies, in the hope that a Jones Act waiver is on the horizon that will allow the purchase of a cheaper vessel from a foreign provider, is not a viable option. Offshore wind developers need to act now to use the available lead time to talk specifics with American companies, or risk finding themselves in a situation where they cannot procure the vessels they need because they waited on a Jones Act waiver that is unavailing by law.

Second, to stimulate supply, we have to focus on demand. It's not surprising that we do not have a fleet of vessels sitting on the proverbial shelf waiting to do everything that needs to be done, because we are creating a new market in this country. The offshore wind industry has already done important preliminary work in identifying the types and rough quantity of vessels necessary – the next step is for wind developers and U.S. maritime companies to come together and talk specifics: Here's what I need; Here's when I need it; How can you help me do this as safely, efficiently, and cost-effectively as possible?

Those conversations are happening now and need to continue, because eight- and nine-figure investment decisions generally are not made based

on the hope of a future opportunity materializing; they are made when there is a letter of intent, a contract, and take-to-the-bank assurance that demand exists to recoup the investment in a long-lived asset.

Third, business risk must be shared and distributed between offshore wind and maritime. It is highly unusual for a vessel owner to build a $100 million-plus vessel on spec and wait to see if anyone wants to take it for a spin. The simplest way to share business risk is a long-term contract.

And fourth, offshore wind and maritime need to collaborate to foster certainty and efficiency in the market. A substantial part of creating the demand that stimulates investment in new vessels will be enabling the timely approval of offshore wind projects, and American maritime must be a full partner to offshore wind not only in developing vessel solutions to meet logistical needs, but also in bringing about the new American offshore wind industry that will benefit our nation's environment and economy. AWO was proud to partner with other organizations in support of full funding for the Port Infrastructure Development Program to build out offshore wind ports in the United States, and we all must seize future opportunities for fruitful partnerships between the two industries, on both the business and public policy fronts, to continue building the infrastructure and workforce needed to make this effort successful.

Following these steps will help build an enduring American offshore wind market to provide our nation with an abundant supply of clean energy.

Column

Passenger Vessels

Ferries V2.0.
Post COVID Opportunities

By Rik van Hemmen, President, Martin & Ottaway

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Since the 1980s

there has been a remarkable revival of ferry services in many U.S. waterfront cities, but COVID-19 has wreaked havoc on the most profitable component of these services: the commuter runs. With post-COVID work-at-home arrangements and part-week in-office work, these ferry services have suffered a tremendous loss of income. But there are glimmers of hope that a recovery is likely, although in a different form, in a different world.

Commuter runs are often the bread and butter portion of a ferry services, but only in the rarest cases can a profitable ferry service be created that only runs during commuter hours. The creation of such services often resulted in a strange design conundrum. Commuters might be attracted to a cleaner, or quicker, or more enjoyable commuter experience, but would often be hesitant to commit to a ferry commute if the ferry only ran during commuter hours. Many commuters have irregular hours, and, if the ferry only runs during peak hours, a commuter may not want to deal with the uncertainty of getting stuck in the city if they could not make it to the ferry by the last afternoon run.

Emerging ferry services often found that they could only capture commuters with rigid working hours and then hit a growth limit. This limit could be broken if the ferry services increased off hour runs, but since these runs would never run at full capacity, they operated at a loss, which then required an additional large investment, beyond the initial commuter service investment.

However, if the ferry service had sufficient financial legs,

it could experience a second growth spurt where commuters with irregular hours will start to use the service. In addition, over time, city shoppers will start to take midday runs, and then business people will take the ferry for lunch or other meetings, and then, on nice days, tourists and sightseers will simply take a ferry ride for the fun of it. Then the ferry company can make an additional investment into smaller day time ferries and larger rush hour ferries (hi-lo mix optimization), and start to make serious money. This is a very complex issue with subtle variations depending on the ferry service's location.

The consequence is that a ferry service takes years to establish, and, therefore, it may take years for it to turn a profit. The flip side to that issue is that once firmly established and properly fine-tuned, ferry services can be quite profitable.

So here came COVID, and in many service areas the ferries tied up due to total loss of ridership. But with odd exceptions. One ferry service managed to make a little money by securing a contract to carry healthcare workers to suitable transit points during the worst of the pandemic. And when ferries were allowed to run at reduced capacity, another ferry operator decided to take their larger ferries and run them at much reduced capacity for whale watching cruises, which could still turn a profit at reduced capacity (and at the same time provided a very nice customer experience with lots of space on a big, fast stable boat that was much better than whale watching on a crowded, slower and rockier smaller boat). Other ferry services started to organize reduced capacity excursions for customers desperate to get out of the house.

Then post peak COVID, ferry companies attempted to revive their commuter services, mostly at government mandated reduced capacity (and much reduced profit potential). Especially in summer, ferries were an attractive commuter option since they provided more personal distancing space, and fresh air on open decks compared to buses or trains.

However, this started the ferry conundrum all over again, and this time in an even more confusing form since rigid nine-to-five style commuters that could afford ferry commuting now had become much rarer. Many of those who were rigid nine-to-five commuters now stopped commuting entirely, or only commuted a few days per week. At reduced capacity it may be possible to fill a rush hour ferry, but what about the full day service runs, which were needed to provide a viable and profitable ferry service?

Right now, most ferry operators are functioning in this strange trial and error grey zone. The most frustrating part of this trial and error grey zone is that one cannot one day decide to start full day service and expect to know in one week, one month, or possibly even one year whether a full day service run is viable or not. This is due to the massive customer acceptance lag time in ferries. Ferry customers do not show up overnight; they need to be carefully cultivated, and this takes a lot of time

This lag time is further affected by the uncertainties that customers themselves face. Many pre-COVID commuters simply do not know what their commute will look like. They may be facing very unpredictable personal choices, and what were once vibrant commuter communities may no longer be commuter communities, or may actually become more heavily populated by part time commuters, or off hour commuters. However, while it is a complex issue for ferry operators, when considered at a larger transportation system level, it is nowhere near the devastation that bus and train operators are facing.

When compared to trains and buses, ferry operators have a number of advantages that may actually result in further use of ferries as compared to trains and buses and also personal transportation.

Consider the customer. The commuter customer used to choose its best option between bus, train or ferry. As long as they all provide all day service, the choice came down to time, quality and cost.

The time variable has not changed much, but the quality factor has, since ferries are inherently more outdoor oriented than trains and buses and also tend to be less crowded. As such, a commuter may now be more likely to choose a ferry over a bus or train for COVID risk reduction reasons.

With regard to cost, there is little difference pre or post COVID for a five-day commuter, but for a part time commuter, the reduced overall cost of the two or three day per week commute may very well compel her to opt for the ferry

instead of the bus or the train. In other words, in part-time commutes, ferries may very well end up gaining, while the big losers will be buses and trains.

At this stage, it is difficult to predict what the long-term post COVID trends will be. An extreme result may be the total disappearance of traditional commuting. Potentially businesses may choose to shut down their center city operations, and commuters as we know them may completely disappear.

Strangely, even then, ferries may still be the winners. Ex-commuters may migrate to relatively isolated places without existing public transportation infrastructure, or may choose to live in places where public transportation infrastructure can be added at low cost. And the lowest initial investment public transportation infrastructure is ……. ferries.

Time for Ferries V2.0. May the smartest operators win.

For each column I write, ***Maritime Reporter & Engineering News*** has agreed to make a small donation to an organization of my choice. For this column I nominate the Worldwide Ferry Safety Association (**https://www.ferrysafety.org/**), and in particular its student design competition, which has provided students with challenging design assignments for eight years now (https://www.ferrysafetydesigncompetition.org/).

*(This article originally appeared in the September 2021 edition of **Maritime Reporter & Engineering News.**)*

Column

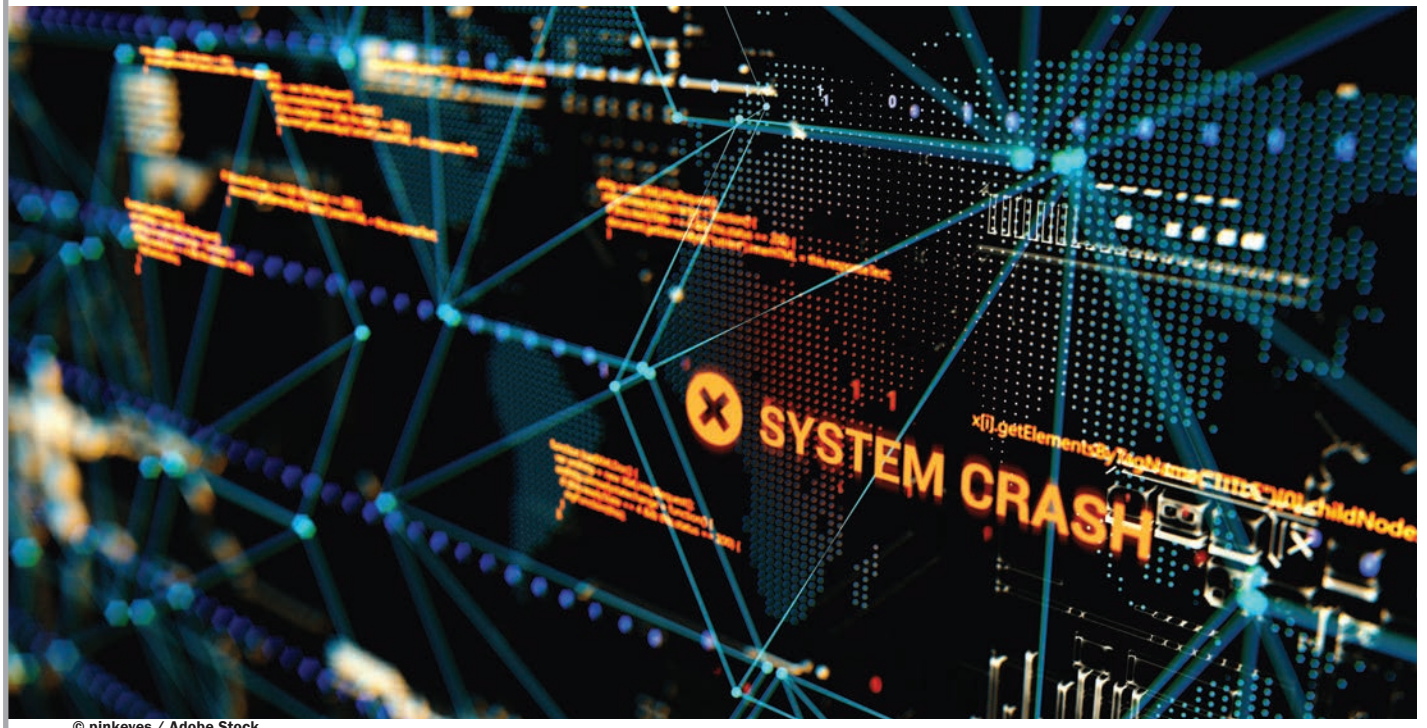
Cyber Security

Maritime Cybersecurity: Prepare, Detect and Respond

By Vanessa C. DiDomenico, Maritime Associate, Blank Rome

At a time when the world has become more aware than ever before about the vital importance of the world's ocean shipping fleet, which carried supplies, merchandise and much needed personal protective equipment during the COVID-19 pandemic, an increased risk from a different threat, cyberattacks, presents a set of new challenges.

According to Israeli cybersecurity specialist Naval Dome, since February 2020, there has been a 400% increase in attempted hacks on the maritime realm, coinciding with a period when the maritime industry turned to greater use of technology and working from home due to the Coronavirus pandemic. Increased phishing attempts, malware and ransomware attacks can be attributed to the changes in operations and procedures during the travel restrictions and operational hurdles encountered during the pandemic. These global challenges resulted in a move by the U.S. to bolster the federal government's cybersecurity practices and contractually obligate private sector to align with such enhanced security practices. For instance, the ransomware attack on Colonial Pipeline, which controls nearly half the gasoline, jet fuel and diesel flowing along the East Coast, prompted President Biden to sign Executive Order (EO) on "Improving the Nation's Cybersecurity (14028)" on May 12, 2021. A comprehensive overview of President Biden's EO can be found here. On August 25, 2021, the President also held a cybersecurity summit with leading tech company and Wall Street banking executives to discuss cybersecurity concerns.



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The Colonial Pipeline ransomware attack provides important lessons for critical infrastructure providers in the maritime industry on being prepared for cyber-attacks. It still remains a mystery how the attacker, DarkSide, first broke into Colonial Pipeline's business network, but recent reports speculate that the pipeline was taken offline because there was no separation between data management and the pipeline's actual operational technology. "Other pipeline operators in the United States deploy advanced firewalls between their data and their operations that only allow data to flow one direction, out of the pipeline, and would prevent a ransomware attack from spreading in." In this case, the attacker did not aim to take hold of the pipeline, but held the data for ransom. The ransomware attack on Colonial Pipeline illustrates the need for separate, offline backup systems and cyber incident response plans.

Similar to the Colonial Pipeline attack and other recent cyber incidents, a targeted cyber-attack upon a sizeable ocean carrier or its supply-chain network could cripple significant segments of the world's transportation capacity to deliver essential goods. We have seen during the COVID-19 pandemic the effects of hindered supply chains, scarce products on store shelves, and long lead times for integral components. To help address the need for increased action against cyber-attacks, the International Maritime Organization (IMO) Maritime Safety Committee, at its 98th session in June 2017, adopted Resolution MSC.428(98) - Maritime Cyber Risk Management in Safety Management Systems. The Resolution encourages administrations to ensure that cyber risks are appropriately addressed in existing safety management systems (as defined in the ISM Code) no later than the first annual verification of the company's Document of Compliance after January 1, 2021. Additionally, the IMO has issued MSC-FAL.1/Circ.3, Guidelines on Maritime Cyber Risk Management. The Guidelines provide high-level recommendations on maritime cyber risk management to safeguard shipping from current and emerging cyber threats and vulnerabilities and include functional elements that support effective cyber-risk management. The Baltic and International Maritime Council (BIMCO) has also published its own Guidelines on Cyber Security Onboard Ships to aid shipowners and ship managers meet the IMO requirement to implement cyber-risk management in their safety management systems. The maritime community should review

these guidelines and implement strategic objectives.

Given the digital revolution that has been taking place in the maritime industry, ships are more connected now than ever before. While the increased connectivity and system integration aids in operational, commercial, and safety efficiencies, it also enlarges the attack surface available to bad actors seeking to exploit vulnerabilities for potential cyber-attacks. There are increased risks for maritime cyber-attacks because shipboard systems and networks are often interconnected with other onboard or remote systems and the internet, which constantly interface with international contacts of all kinds. Both new and old vessels can be susceptible to cyber incidents. Newer vessels are being branded as "smart" ships with thousands of sensors, remote monitoring and troubleshooting, and artificial intelligence capabilities to analyze data in real time. These vessels integrate information technology systems with operational technology systems, thus increasing the exposure of these interdependent systems to cyber incidents. Older ships that are not as sophisticated could still experience a cyber incident because of obsolete operating systems that can no longer be updated, missing or outdated anti-malware software, insufficient security protocols and safeguards (including employee mismanagement of the network and the use of default administrative accounts and simple passwords), integrated computer systems that lack safeguards and network segmentation, systems that must be connected to a server on land to function correctly, or are always connected to a system on shore that is not secure, and unsecure access controls for service providers and contractors. Thus, it is vital to invest in cyber assessments to identify potential areas of weakness to combat potential threats.

The large maritime-cyber ecosystem, consisting of shipboard automation and communication systems, cargo and passenger manifests, port operations and other supply chain members, needs to remain vigilant and proactive by performing cybersecurity training and simulated tests, deploying defenses and developing incident response plans. Defenses require continuous improvement and there is no one-size-fits-all approach. Both procedural and technical countermeasures are needed, and a layered approach is essential. Possible defenses include: backup and data recovery capabilities, multi-factor authentication and access controls, anti-malware tools, robust network monitoring processes, use of Virtual Private Networks (VPN), maintaining software upgrades, patches and maintenance schedules, email and spam filtering, providing security awareness training to personnel and maintaining and testing an incident response policy and physical security to restrict access to shipboard areas. Shipowners, charterers and seafarers also have vital roles to play. Shipowners need to ensure there are prevention, detection and response plans in place. Shipowners and charterers need to understand who bears the risk if a cyber incident occurs that results in delays, damage to the vessel or ransom payments. Shipowners should understand the extent of insurance coverage for cyber incidents and potential losses due to third-party liability. Seafarers should follow company compliance plans and policies to protect onboard systems from phishing attempts and eliminate other opportunities for potential cyber breaches through shore visits, and ship-to-shore interfaces and remote access. Ship managers should also ensure the proper contractual language is inserted for third party suppliers and agents to protect and secure sensitive data and information, and that contractors are properly vetted.

As shipping continues to move towards remotely operated and autonomous driven vessels, stakeholders and governments must collaborate to identify new risks and regulatory gaps. The need for new tools and collaboration to protect against cybersecurity incidents is paramount, as the ecosystem is only as strong as the weakest link. For example, Blockchain and other encrypted solutions could aid in the safety and security of maritime transactions. Not only does Blockchain simplify and provide transparency into fragmented shipping and logistics processes, Blockchain does not have a centralized server, thus reducing the chances of malicious cyber-attacks. Blockchain also reduces inefficiencies, such as error-prone manual exchanges between numerous parties. Furthermore, investment is needed. Developing nations will require support to ensure resilience throughout the supply chain against potential future disruptions. Maritime cybersecurity is a topic that will continuously change course depending on how the industry, and key stakeholders prepare, detect and respond.

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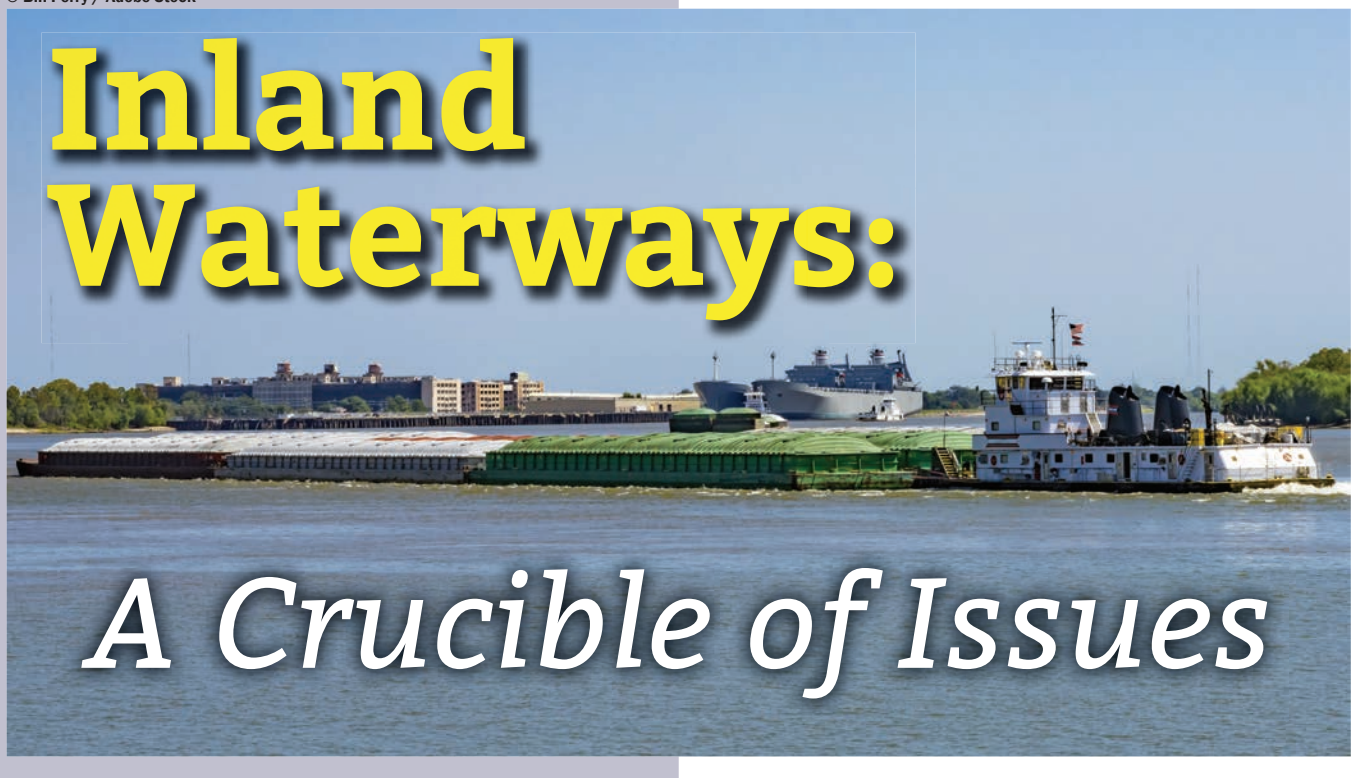

Inland Waterways: A Crucible of Issues

By Tom Ewing

As 2022 appears on the not-so-distant horizon, we asked inland waterways executives to reflect on the major issues impacting their industry. Just how those issues evolve – and whether they present as challenges or opportunities – is, of course, unknown. Answers to some future questions will be relatively straightforward, confidently based on industry knowledge and experience. Other outcomes remain hazier, and next steps could be influenced by forces and players completely removed from the business of barges, tugs, tows, breakbulk and infrastructure.

Mother Nature always in charge

Mike Steenhoek is Executive Director of the Soy Transportation Coalition, an organization established by 13 state soybean boards and soy trade associations, based in Ankeny, Iowa. The inland waterways are critical to the coalition and its agricultural base.

As Steenhoek reflected on waterway issues, his first reference was to Hurricane Ida. "We're still clawing our way out of that," he commented, noting extensive damage to the barge industry. The Louisiana Gulf Coast—the country's busiest hub for corn and soy exports—was severely damaged by Ida on August 29, triggering weeks of logistical challenges due to power outages and damaged terminals along the Mississippi River from Baton Rouge to the Gulf of Mexico.

Another issue is low water levels in the upper Midwest. Barge companies, Steenhoek said, are recommending light loading. That's problematic for an industry based on long distance transport and heavy loads. If those strengths change, so do the economics.

Low water was also cited by Dennis Wilmsmeyer, Executive Director of America's Central Port, in Granite City, Ill. at the confluence of the Missouri and Mississippi Rivers.

"Flows out of reservoirs into the river system are declining at a time when the upper Midwest has experienced

below normal rainfall," Wilmsmeyer wrote in an email. "We are facing low water now which could lead to real navigation issues in the next three months if no significant precipitation comes."

Steenhoek noted that low water has been somewhat offset by the Army Corps' strong dredging program. "We're benefiting today," he said, "because of good work done earlier."

COVID and labor

"Companies are unfortunately finding COVID a bigger challenge now than any other time," Jennifer Carpenter commented, without hesitation, when asked about waterways challenges. Carpenter is President and CEO of the American Waterways Operators (AWO), the national advocate for the U.S. tugboat, towboat and barge industry. "COVID is not in the rearview mirror," she emphasized.

Carpenter said the Delta variant has been challenging. Vaccination policies have been difficult to implement. Even where there has been some success, she noted, it has taken an inordinate amount of work and resources.

COVID is intertwined, Carpenter added, with a second challenge: finding employees. Carpenter said that staffing, ensuring reserves and resiliency in work crews are the issues "keeping people up at night." Many industries are experiencing labor shortages, but the special arrangements required for waterways personnel—including days and weeks away from home and family—can weigh more heavily now against choosing a maritime career, or staying with it, versus a land-based job.

Wilmsmeyer, too, commented that "like nearly every business in the U.S. today, employment shortage on the inland river system is one of the largest challenges and could remain a concern for the foreseeable future." Worker availability will impact the degree to which "the inland waterways can pivot" to handle the economy's constantly increasing need to move cargo. He commented further that "the demand to move products by barge is there and growing, but we need to be able to make sure the people are in place to load and unload them."

Marine highways

Wilmsmeyer's notion of pivoting is important. On the one hand, it implies preparing for a rebound, having personnel and equipment ready to go.

ACP

"Flows out of reservoirs into the river system are declining at a time when the upper Midwest has experienced below normal rainfall. . . We are facing low water now which could lead to real navigation issues in the next three months if no significant precipitation comes."

– Dennis Wilmsmeyer,
Executive Director,
America's Central Port.

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Bigger picture, though, it also implies being ready for new opportunities. Many people comment that the inland waterways are at a jumping-off point, close to taking on a bigger role in America's overall freight network.

A number of forces are driving this potential.

Workforce, again, is fundamental. Yes, waterways operators may be working double-time on staffing, but so are trucking companies and railroads. By choosing the right policies now and developing competitive wages and benefits, waterways companies have a chance to attract, and keep, entry level workers and people seeking to take advantage of new opportunities within an expanding economy. After all, waterways employment pays well, providing a lucrative career pathway, no college needed to get started.

Another driving force is that highways and rail, at least for freight, and particularly regarding urban infrastructure, are close to their physical limits. Even truck-driving robots will get stuck in traffic. In the years ahead, Interstate expansion will be marginal.

Marine highways, however, have plenty of capacity, ready now. Recall, the marine highway system is a formal, designated program within U.S. Department of transport (DOT) and among many state DOTs.

On the inland system business, managers see new opportunities emerging. On the supply side, these are coming from U.S. Maritime Administration (MARAD) supported projects that are reaching completion. On the demand side, freight experts report that customers are almost frantic for alternatives to a freight delivery system that is gridlocked or close to it. With freight, as with all things, pricing and timeliness are critical. But dependability is a huge part of timeliness. For land-based transport, dependability is elusive, if not absent altogether. People are noticing that waterways can offer competitive rates on a system with plenty of capacity.

One project that exemplifies this pivot point is the barge shuttle facility being built at the Ports of Indiana-Jeffersonville on the Ohio River, just north of Louisville. This is a MARAD Marine Highway Grant project awarded in 2020. It will help Nucor Steel, in Kentucky, move steel coils to customers along the Ohio River. Projections are that river transport will take more than 2000 trucks off the highways and eliminate more than 130,000 miles in one-way truck hauls.

An even bigger project, with far-reaching implications for the inland system, is the project by American Patriot Holdings, working with Plaquemines Port Harbor & Terminal District, to develop and build a specific vessel for container shipments on the Mississippi, from the Port to Memphis, and perhaps to St. Louis. APH officials are con-

WCI

"[Waterways Council, Inc.] continues to be hopeful that an infrastructure deal will be reached and signed into law by the end of the year."

– Deb Calhoun,
Senior VP, WCI

"If the inland waterways are at the cusp of momentous change, stellar performance has to be routine; no excuses."

fident that demand for their service will be based on a solid business case. For shippers, this new service will be first choice, not a fall back.

On the east coast, marine highway projects already have a high profile. Consider the 64-Express, at the Port of Virginia's Richmond Marine Terminal, on the James River, operating since 2008. The Port estimates that 2020 barge transport eliminated nearly 20,000 truck trips. Expansion to serve the I-95 corridor is under review. Another example is the container on barge service between Baltimore and Philadelphia on the C&D Canal.

Green

Note the references above to fewer truck trips. Environmental issues are a strong catalyst in this transport crucible. Many people are at least generally aware that one barge can carry 1,750 tons of dry cargo, a volume requiring 16 rail cars or 70 trucks.

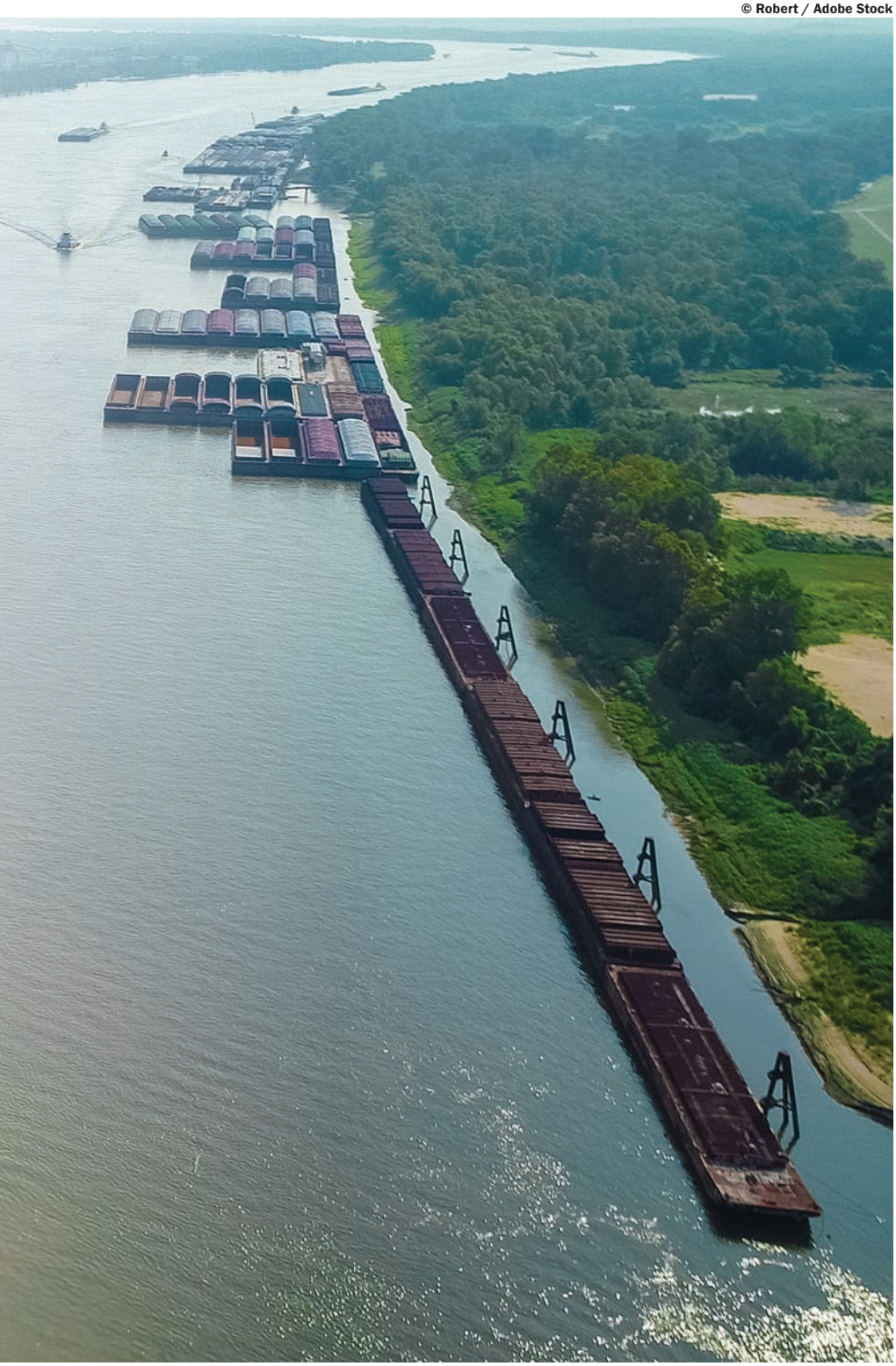
In the last few years environmental awareness has morphed into environmental saturation, a prism used on every issue. Sustainability and a low-carbon footprint are now operating principles, particularly regarding transportation, heavily dependent on petroleum. These days companies don't just talk about net-zero, they document their efforts, even using third-parties for confirmation.

Given this priority, river transport stands out. It's a compelling message when you can claim that your products and operations don't depend on hundreds of 18-wheelers stuck in traffic within dense urban neighborhoods spewing exhaust near schools and playgrounds and can move from point A to point B using 100 gallons of fuel instead of 1,000 gallons. Yes, many consumers like that, but more importantly is that an increasing number of elected officials and policy makers are starting to demand such performance.

The other green: $

If the inland waterways are at the cusp of momentous change, stellar performance has to be routine; no excuses. In its 2021 Infrastructure Report Card, the American Society of Civil Engineers give inland waterways a D+. Don't despair too much, the roads category earned a D.

Regarding money, there is reason for optimism. Consider the completion of the Olmsted Dam, in 2018, after 30 years. When asked about Olmsted now, waterways officials are emphatic about exceptional operational benefits. Then a second comment: they're glad Olmsted is done because



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now we can move to the next big one and develop a list with new projects. For decades, Olmsted sucked all the oxygen out of the room. That's over with, funds can be shifted elsewhere.

One regional project that will affect operations in 2022 is the ongoing replacement of the Merchants Bridge, a railroad bridge at St. Louis. Dennis Wilmsmeyer at ACP said that the first new span was installed in September. Plans are to replace a second 520' truss span in March of 2022, closing rail traffic for 10 days and, within that time, river traffic will stop for two days. Installation of a third and final truss is planned for the fourth quarter of 2022, with similar closures. System impacts are important: Wilmsmeyer said the Merchants bridge "is a lifeblood for many river terminals in the region."

At the national level, work in 2021 continues with major Army Corps projects at the Lower Mississippi and 2,000 miles away at the Upper Mississippi. A "deficiency project" in 2021 at the Melvin Price Dam should conclude construction there. On the upper Ohio, the Lower Mon project continues with completion slated for 2023 or 2024.

This work—these investments, really, in new construction and maintenance—are literally foundational if the inland waterways are to be ready for the freight and transportation pivot.

With federal funding, waterways officials describe unique and favorable circumstances. The CARES Act and WRDA 2021, passed at the end of 2020, established new policies to bulk up expenditures. FY2022 budget proposals (as of this writing) show that Congress is indeed delivering a bigger budget for waterways projects. In addition, the proposed infrastructure bill would add still more money.

Deb Calhoun is Senior VP of the Waterways Council, Inc. (WCI), a national organization that advocates for a modern, efficient and well-maintained inland waterways. She said the council "continues to be hopeful that an infrastructure deal will be reached and signed into law by the end of the year." She estimates that infrastructure spending and budget appropriations could deliver "more than $4 billion over the next five years" for priority projects.

The inland waterways always had brains, talent and expertise. Now add money, customer demand, policy goals, efficiency and a competitive standing. 2022 could be the year.

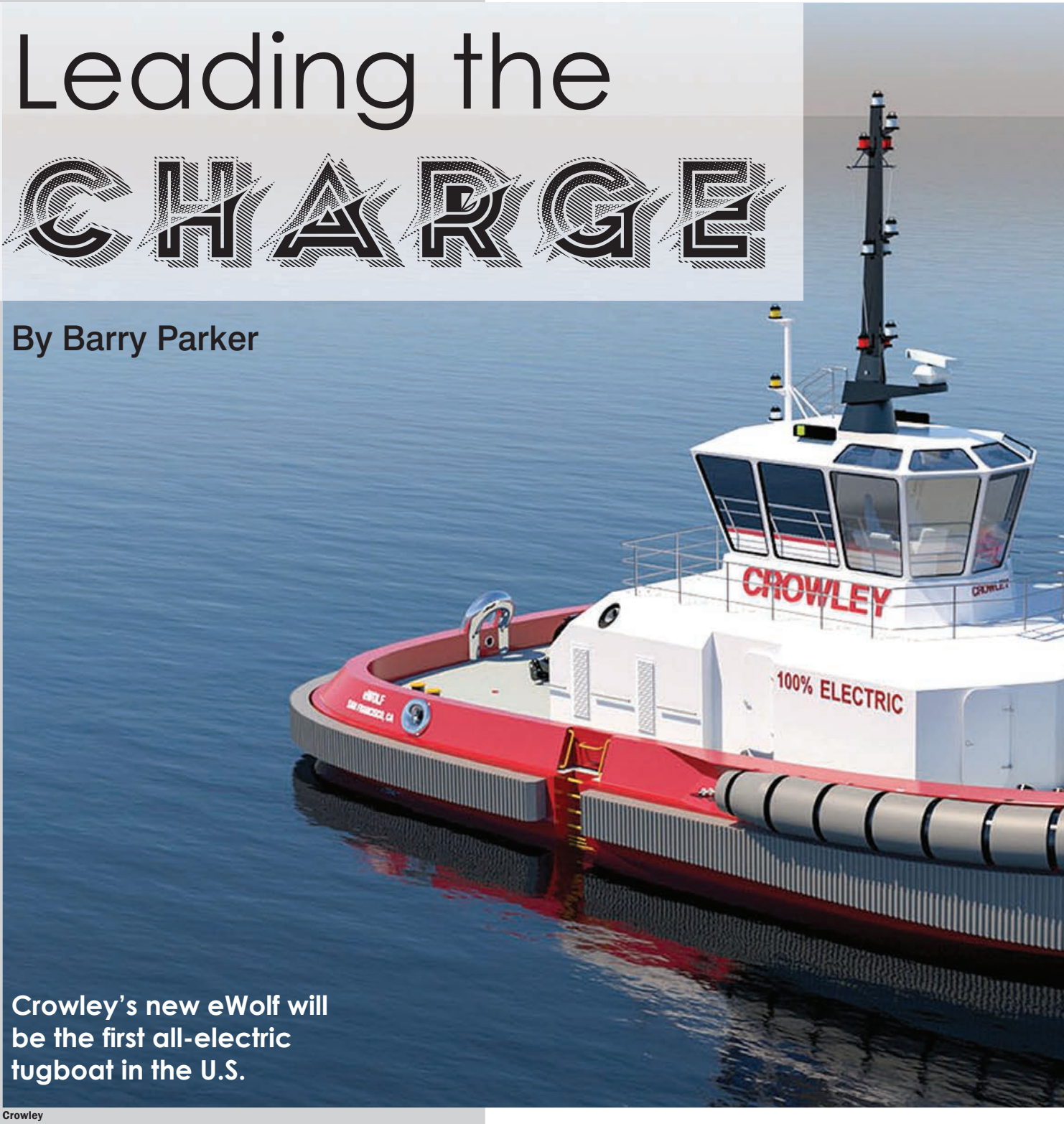
AWO

"Companies are unfortunately finding COVID a bigger challenge now than any other time."

– Jennifer Carpenter,
President and CEO, American Waterways Operators

Leading the CHARGE

By Barry Parker



Crowley's new eWolf will be the first all-electric tugboat in the U.S.

Crowley

Maid of the Mist's James V. Glynn and Nikola Tesla are the first all-electric newbuild passenger vessels in the U.S.

ABB

Alternatives to fossil fuels are emerging throughout the maritime universe, and vessels working in U.S. rivers, waterways and harbors are at the cusp on this trend. While the alternative fuels spectrum is wide, battery power and electrification—a technology that has seen a decade of shipboard applications already—is particularly suited for smaller vessels.

Crowley Maritime Corp will be taking delivery of a completely electric tugboat, dubbed eWolf; the boat-which will include kit for advanced vessel control tied to an electric propulsion system from ABB, is expected to be delivered in mid-2023 from Master Boat Builders in Coden, Ala., not far from Mobile. The boat will handle ship assists at the Port of San Diego, Calif. Crowley said, "The electric tug will replace one that consumes more than 30,000 gallons of diesel per year." The 82-foot vessel will have 70 tons of bollard pull. Supplier ABB had noted, "It will be the first all-electric, battery-powered harbor tug ever built and operated in the United States and only the third of its kind to enter operations worldwide." Crowley added that: "The eTug's battery system will be charged at a specially designed, shoreside station developed with Co-

chran Marine." Cochran, based in Seattle, is best known for its shore power hookups at East and West Coast ports. ABB said, "Batteries provide power to the propulsion system almost instantaneously." The tug's spec sheets indicate its 6.2- megawatt-hour (MWh) Corvus batteries will power a pair of Schottel azimuthing thrusters with two 2,100-kilowatt (kW) RAMME motors. ABB noted, "The battery allows the tug to complete a full day of typical work before there is a need to charge." For long transits, a 9,800 gallon fuel reserve can power a pair of 300 kW auxiliary generators.

Electrification is already being deployed in the North American ferry sector. Projects include BC Ferries' Island Class hybrid boats built by Damen at its Galati yard in Romania, with the first two of six already in service. Reflecting the automobile industry's influence on maritime efforts toward electrification, BC Ferries said, "The new Island Class is a diesel-electric battery hybrid ferry that has many similarities to a Toyota Prius car's power train." The passenger/car ferries' electrically driven azimuth thrusters (from Schottel, 2 @ 950 kW, or 1,200 hp) are powered by diesel generators (2 @ 2,000 hp, or roughly 1,500 kW) with two Corvus battery packs of 400 kW each. Other ferries with hybrid capabilities on the drawing board include a boat architected by Elliott Bay Design Group (EBDG) that will be built for service in Casco Bay,

Fassmer

Electric boats are coming, but when?

Marine News queried Steve Trkla, president of Torqeedo's operations in the States, on this question. He commented as follows: "The drivers behind the growth of marine electromobility worldwide are environmental and economical. The clock is ticking for the goals of the Paris Agreement. Transportation contributes about 25% of energy-related greenhouse gas emissions and is growing faster than any other end-use sector. Transitioning the light commercial fleet, such as passenger ferries, patrol boats, support vessels, freight transporters and offshore wind support vessels to electric power will make an enormous contribution to achieving those goals."

On the economic considerations, he explained that the move toward electrified propulsion could be greatly accelerated if subsidies on fossil fuels are eliminated, a move supported by many signatories of the Paris Climate accord. "The current higher upfront costs for electric propulsion are more than offset by the savings in operating expenses, which yield lower overall costs of ownership," he said, adding that, "We estimate that for a vessel that's on the water more than 100 days a year, the operator can save money by going electric."

When asked about particular projects with U.S. based operators in the works for Torqeedo, he could not comment on specific discussions, but wryly answered, "It would be interesting for us to revisit this subject again at the same time next year. I promise we'll keep you and your readers informed as events unfold."

Maine. Farther south, North Carolina's state ferry system is also looking at electrification. And in the West, Skagit County Public Works and Seattle-based vessel designer Glosten are seeking proposals from electrical integrators to provide the vessel and shore electrical systems and the automated charging plug for a new all-electric ferry. A converted all-electric, zero-emissions car and passenger ferry has been operating in Gee's Bend, Ala. since 2019.

For the short passenger excursion runs around Niagara Falls (typically 20 minutes), Maid of the Mist, a long-time operator of passenger tour boats, was able to go fully electric with a system put together by ABB. The boats, which entered service in late 2020, use 400 kW propulsion and 316 kWh of battery capacity (in two 158 kWh packs). A shore-based system provides re-charge capability during breaks for embarking/ disembarking passengers. In San Francisco, the dual powered sightseeing vessel Enhydra has been in service since 2019, with a package designed by BAE Systems, using conventional propellers tied to the BAE HybriDrive propulsion system, with lengthy bona fides from the land transport sector. Kitsap Transit is also using a BAE electric-hybrid system for its passenger ferry, Waterman, which operates out of Washington State's Port Orchard.

Garrett Rice, the president of the Master Boat Builders yard, spoke to ***Marine News*** in detail about the eWolf order, while also providing insights on the likely future for fully electric tugs. "We have frequent conversations about 'what's next?' because

the technology and innovations are changing almost daily," he said. "Boat operators are trying to see what should you invest in next…and want to invest in a boat that will last- for decades." Among the 10 tugs presently under construction at MBB, he said that most are convention diesel powered, but there are two hybrids (diesel electric / diesel mechanical) and, now, the all-electric boat for Crowley.

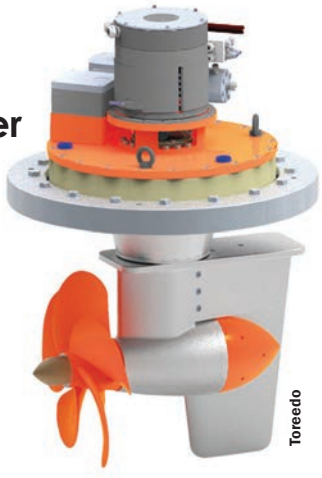
There is not one boat type that will instantly become an industry standard. Rice offered the perspective that: "Every port in the United States is different…every job is different…and there are different missions for harbor tugs in each port. When you start bringing in different propulsion solutions besides conventional diesel, it does matter what the boat is going to be doing." Summing up, he explained, "You can only put so many batteries into a harbor tug," referring to constraints on the size of those vessels. "Harbor tugs are not very big," he said. Looking ahead, Rice hinted at some news a few months out, saying, "We are working on a very flexible design- for a boat that can work in any harbor."

The case for batteries for small boats serving harbors is a convincing one. Steve Trkla, president of the U.S. arm of Torqeedo, told ***Marine News***, "One area that's often overlooked when discussing electric vs conventional internal combustion systems is the superior instant torque delivered by electric drives at slow speeds. This translates into better maneuverability and more efficient pushing/pulling of loads." His company, based near Munich, is a part of the DEUTZ Group, one of the world's leading manufacturers of drive systems and offers a fully integrated high-voltage electric propulsion system Deep Blue and the Cruise product for smaller vessels. It also provides

Skagit County Public Works and Glosten are seeking proposals to provide the vessel and shore electrical systems and the automated charging plug for a new all-electric ferry design.

Glosten

Steerable thruster for Torqeedo Fassmer ferry



Toreedo

multiple battery options; its Deep Blue drive systems can be configured to provide lithium-ion battery bank capacity of between 80 kWh and 1 MWh.

Much of the inspiration for U.S. designers and builders will come from Europe and Asia, with a head start on electrification for working boats, and also passenger ferries, serving the harbors and waterways. Rice, from MBB, mentioned BC Ferries' project, and said, "Battery power makes a lot of sense, because the boats go from Point A to Point B, and then you can set your charging up." Torqeeda's Trkla cited electrification of vessels in Amsterdam, Paris and Istanbul, as well as Bangkok, which he noted is running a fleet of 20 Torqeedo-powered 40-passenger commuter vessels (including new vessels and retrofitted diesel units). In early October, Torqeedo announced that it had teamed up with Bremen-based boat-builder Fassmer, on a fully electric ferry concept, dubbed CIT-E, for passenger transport, particularly on urban waterways. The CIT-E boats, with capacity for as many 100 passengers, would be propelled by twin steerable thrusters, delivering continuous power of 100 kW (peak power of 130 kW), according to Fassmer.

Electric solutions will not be ubiquitous. A more cautious view on electric power came from Ted Tregurtha, the president of Moran Towing (involved in both harbor and coastal work), on a panel at the 2021 ShippingInsight conference, held virtually in mid-October 2021. On the subject of battery power, he told the online audience, "We are not there yet," explaining that "from Moran's perspective, packing a lot of energy into a very small package is difficult. We've not found commercially-ready technology for that." He also expressed concerns about the present state of infrastructure, saying, "Even for something as simple as battery power, in

Toreedo

"One area that's often overlooked when discussing electric vs conventional internal combustion systems is the superior instant torque delivered by electric drives at slow speeds."

– Steve Trkla, President of Torqeedo's U.S. arm

Master Boat Builders

"We have frequent conversations about 'what's next?' because the technology and innovations are changing almost daily."

– Garrett Rice, President, Master Boat Builders

Electrically powered boats: what's different? The shipyard view

From the shipyard perspective, what has to be done differently when building an electrically powered vessel working around harbors, compared to the conventional diesel version of a vessel performing similar duties? *Marine News* asked Master Boat Builders president Garrett Rice this question. "The hull form and the deckhouse are fairly the same. However, once you get into the actual propulsion system, it's like night and day." He explained further, "With a diesel boat, you need to think through the configuration of water-cooled engines, fuel piping, all the different pumps, and many other considerations." For electric propulsion, "it's totally different" he said, enumerating issues such as "wire weight, harmonics between power cables, separation of DC power cables from AC power cables, and the placement of numerous elements of smart systems that will avoid interference down the road." He said, "Instead of doing extensive 3D modeling of the piping, we do less of that, but we do much more in the way of modeling the wire-ways."

Rice stressed the importance of extreme cooperation among the multiple participants in the design and building process. Instead of dealing with competing aims of the shipowner, builder, and naval architects, which could potentially arise, he said, "We developed an approach where we could bring all the parties to the table early on, at the beginning of the design process, to make sure that all perspectives are heard and are on the table and carefully looked at."

Damen is building BC Ferries' hybrid-electric Island Class vessels in Romania

Damen Shipyards Group

most of the harbors in North America right now, you can't get the amperage that you need in order to charge those batteries in a reasonable time frame."

American Bureau of Shipping (ABS), in conjunction with a team from Vanderbilt University, published a report, "Decarbonization of the Inland Waterway Sector in the United States – Pathways and Challenges to a Zero-carbon Freight Future". Though the study's focus concerns vessels serving inland waterways (with Vanderbilt, situated in Nashville, having close ties with the local towboat owning community), a relevant finding is that the ubiquitous "fleet boats", with wait times built into their daily work streams, are ideally suited for battery power. "The characteristics associated with Sustainability drivers of inland waterway fleet boats are similar for certain segments of the harbor tug market," said Roy Bleiberg, ABS vice president, North America regional business development.

With alternative energy still expensive, in many cases, compared to conventional fuels, the transition to electric (and other) power sources will not happen on its own. The ABS/Vanderbilt report noted, "Decarbonizing the inland waterway sector will likely require new regulatory or market-based incentives, similar to those emerging in other economic sectors around the globe, in order to make decarbonization economically viable." This is borne out in Crowley's eWolf announcement, where they offer that "the eTug will be a result of a partnership among Crowley, the San Diego County Air Pollution Control District, the California Air Resources Board, the Port of San Diego, the U.S. Environmental Protection Agency and the U.S. Maritime Administration, which all provided financial support and other resources."

All American Marine

SEA CHANGE

AMERICA'S FIRST HYDROGEN POWERED FERRY

SWITCH Maritime's new 70-foot passenger ferry Sea Change is navigating uncharted waters as the United States' first zero-emissions, hydrogen fuel cell-powered, electric-drive ferry.

The pioneering aluminum newbuild, constructed by Bellingham, Wash. shipbuilder All American Marine, Inc. (AAM), has been completed and was launched this summer, though permitting of hydrogen fuel systems for maritime vessels is still being worked out with the U.S. Coast Guard.

"Legislation and laws for passenger safety did not exist yet for this type of vessel. So, working hand in hand with the Coast Guard to create a set of rules to streamline this in the future was a necessary challenge to promote the adoption of any new technology," said AAM president and COO, Ron Wille.

The project is funded by private capital from SWITCH, an impact investment platform aiming to build a fleet of exclusively zero-carbon maritime vessels. "By working closely with the U.S. Coast Guard, with innovative technology partners, and with best-in-class shipyards such as All American Marine, we can make the transition to decarbonized shipping a reality today," said Pace Ralli, cofounder and CEO of SWITCH. "We don't have to wait."

The first-of-its-kind Sea Change is equipped with a hydrogen fuel cell power package provided by Zero Emissions Industries (formerly Golden Gate Zero Emission Marine), comprised of 360 kW of Cummins fuel cells and Hexagon hydrogen storage tanks with a capacity of 246 kg. This system is integrated with 100 kWh of lithium-ion battery provided by XALT and a 2x 300 kW electric propulsion system provided by BAE Systems. The vessel design originates from Incat Crowther, and the construction supervision and management is led by Hornblower Group.

The USCG Subchapter T vessel has capacity for 78 passengers and can be operated by a crew of two. The vessel includes ramps to the bow and side loading gates to provide

access for people with disabilities. The bow utilizes a standard bow radius for use in many U.S. cities, and an elevated wheelhouse affords excellent visibility over bow loading operations. Sea Change can reach a top speed of 20.5 knots.

AAM's Wille said he believes hydrogen fuel cell technology will leapfrog traditional diesel and hybrid-electric propulsion methods as the most beneficial for maritime applications. "There are a number of reasons why we see this pivot, but the main reason is basically it's both transportable and has very high energy density. Hydrogen has more power and weighs significantly less than other forms of energy. Li-on batteries are roughly 50 times as heavy as diesel fuel. This makes it very difficult to go either far (or fast) in a boat running on batteries.

"On a pound for pound basis, hydrogen has nearly three times the energy of diesel fuel and can also be used more efficiently in fuel cells than diesel in internal combustion engines.

"Simply put, hydrogen can be compressed into a much smaller space and weighs far less than both its battery or diesel equivalent. Therefore, in the same amount of space taken up by a battery bank or diesel tank, you can have much more hydrogen and travel much further.

"It's also modular and scalable, with a number of fuel cells generating energy, if one happens to go offline, it can easily be swapped while the others continue to do the work. It doesn't result in the need for an entire engine replacement. It's much simpler and all made up of components and systems that have been used before and are proven in the transportation sector."

Wille noted that passenger vessels are "an ideal starting point" for the maritime industry's adoption of zero-emissions technologies. "The short routes, consistent schedules, relatively low energy requirements made ferries an ideal candidate," he said. "[Sea Change] provides a unique quiet passenger experience, no diesel engine noise or fumes.

"It's a beautifully built, modern looking passenger ferry to go alongside it being the first of its kind in the world fully run on hydrogen fuel cell technology. Complete with reusable bottle filling stations, top of the line seating, bike racks, and a state-of-the-art pilot house, the hydrogen fuel cell propulsion system is really what stands out. And the fact that this system is modular and scalable, is really exciting."

But Wille believes Sea Change and its groundbreaking zero-emissions power systems are just the tip of the iceberg. "This vessel is the first step towards decarbonizing the maritime industry. This technology will have a global impact. This isn't just about a ferry. This is about a viable future for the maritime industry. It's about not only the potential for cargo ships, it's also about an increased awareness in public transport, daily work commutes and ultimately, the passenger experience. This technology will directly affect future passenger ferries and water taxis, and your commute to work in the future by providing a quieter and sustainable commute."

This project has received municipal support including a $3 million grant from the California Air Resources Board (CARB), administered by the Bay Area Air Quality Management District (BAAQMD), that comes from California Climate Investments, a California statewide initiative that puts billions of Cap-and-Trade dollars to work to reduce greenhouse gas emissions, strengthen the economy, and improve public health and the environment – particularly in disadvantaged communities. Additionally, the project received the first ever loan guarantee under BAAQMD's Climate Tech Finance program, which seeks to reduce greenhouse gases by accelerating emerging climate technologies. In partnership with the California Infrastructure Economic Development Bank and the Northern California Financial Development Corporation (NorCal FDC), the Climate Tech Finance team led a technology qualification and greenhouse gas analysis that deemed SWITCH eligible for a loan guarantee. This loan guarantee supported SWITCH in securing a $5 million construction and term loan with KeyBank, which enables SWITCH to bring the project to completion.

SSG MICHAEL H. OLLIS

FIRST IN A NEW CLASS FOR A NEW YORK CITY ICON

Eastern Shipbuilding Group

There's a lot to like about the newest vessel commissioned by the New York City Department of Transportation's (NYCDOT) iconic Staten Island Ferry. The state-of-the art 320-foot, 4,500-passenger SSG Michael H. Ollis commissioned in October sports the classic design features of the instantly recognizable the Staten Island Ferry fleet, but it's updated throughout for improved comfort, safety and efficiency.

Named in honor of U.S. Army Staff Sgt. Michael H. Ollis, a Staten Island native who was killed shielding fellow soldiers from a suicide bomber in Afghanistan in 2013, the newbuild is the first in a series of three Ollis class ferries designed by Elliott Bay Design Group (EBDG) and built by Eastern Shipbuilding Group for Staten Island Ferry. "The Staten Island Ferry is an iconic transportation vessel recognized around the globe. For [the new ferry class] to honor one of our fallen heroes makes it even more special," said Joey D'Isernia, President of Eastern Shipbuilding Group.

According to Eastern, the new ferries are larger, reflect modern technology and will operate more safely in extreme weather conditions. They feature new customer-service amenities such as more comfortable seating and phone-charging outlets and an oval upper-deck promenade that will for the first time serve as an outdoor walking track for riders.

John Waterhouse, chief concept engineer at EBDG, said a key priority when designing the Ollis class was to ensure the new ferries interface seamlessly with existing terminals to ensure that the service maintains its "brisk schedule". In addition, the new ferries were designed with a number of "resiliency features" in mind, as in the wake of 9/11 and Superstorm Sandy the vessels would be used, if necessary, to help evacuate New York City. According to Waterhouse, part of this resiliency is the Voith Schneider propulsion units, which allow "a great deal of maneuverability and control of the vessel when coming into places that might not be its normal dock." The new vessels also feature side doors so that they can load passengers alongside instead of solely through the ends of the ferry.

Each ferry features four ABS Electro-Motive Diesel (EMD) L12ME23B at 750 rpm EPA Tier 4 marine propulsion engines with two engines powering one ABS Reintjes DUP 3000 P combining gear and one ABS 36 RV6 ECS/285-2 Voith Schneider Propeller at each end of the vessel. Power generation is provided by three ABS, EPA Tier 3 marine continuous duty diesel generator sets, Caterpillar C18 driving 480 V, 60 Hz, 3-phase generators rated at 425 kW at 0.8 P.F. at 1,800 rpm.

Gladding-Hearn

SUSQUEHANNA

THE LATEST AND GREATEST FROM A PILOT BOAT CLASS THAT'S TRIED AND TRUE

A winning recipe from Gladding-Hearn Shipbuilding, Duclos Corporation, has made the Chesapeake class one of America's most popular pilot boats.

Since the series was introduced by the Somerset, Mass., shipyard in 2002, more than 20 have been delivered to 12 pilot associations throughout the United States, including the Susquehanna recently handed over to the Association of Maryland Pilots. In fact, Susquehanna is the fourth Chesapeake launch delivered to the Maryland Pilots, who were one of the original adopters of the design when it took delivery of Patapsco in 2002. That first vessel, by the way, is still in service and running strong.

Susquehanna is the latest and greatest of the tried and true Chespeake class, which has evolved thanks to a large number of small incremental tweaks and changes through the years, said Peter Duclos, Gladding-Hearn president and business development director. "The Chespeake class is current and valid today because we've continued to make better. A lot of things are similar, but it's not the same boat that it was in 2002," Duclus explained. "The result of all these changes is that the boat is faster yet burns less fuels, and it's heavier, more comfortable and capable."

With a deep-V hull designed by Ray Hunt Design, the new all-aluminum Susquehanna measures 52.6 feet overall, with a 16.8-foot beam and a 4.8-foot draft. Powered by twin Volvo Penta D16, EPA Tier 3-certified diesel engines, each producing 641 Bhp at 1,800 rpm, the vessel's top speed is over 26 knots. The engines turn five-blade Bruntons NiBrAl propellers via ZF500-1-A gear boxes. A Humphree interceptor trim control system, with its Automatic Trim Optimization, is installed at the transom. The launch is equipped with a 12kW Northern Lights genset and 100% LED lighting.

The vessel's wheelhouse, with a small trunk, is installed amidships on a flush deck. With electrically heated forward-leaning front windows, the wheelhouse is equipped with five NorSap shock-mitigating reclining seats, a baggage rack and control console. The forecastle includes a Porta-Potty, split upholstered settee/bunk, lockers for tools and safety gear safety gear and a custom immersion suit rack. The vessel's interior is heated and cooled by two 16,000 Btu reverse-cycle HVAC units, in addition to a 2,000-watt 240 VAC heater in the wheelhouse and in the forecastle.

Outside the wheelhouse are heated side-decks and handrails to prevent ice accumulation. An aft ladder leads to hinged boarding platforms on the roof. A control station is at the transom, along with a hydraulically powered J-Basket rescue system, for pilot rescue operations.

Breaux's Bay Craft

SPINDLETOP

THE LARGEST PILOT BOAT IN THE U.S.

With a long, dark deep-V hull and its aquamarine coloring up top, Sabine Pilots' newest launch Spindletop delivered in mid-March is definitely a head-turner. But perhaps most attention grabbing is the vessel's dimensions: 90 feet long and 23 feet wide.

"Spindletop is the largest all-aluminum pilot vessel built in the U.S.," said Roy J. Breaux, Jr., president of Breaux's Bay Craft, the Loreauville, La. shipyard that built the groundbreaking vessel. "When Sabine Pilots came to Breaux's Bay Craft to have this vessel built, they requested a Gulf of Mexico Bottom with a plush and comfortable interior, fuel efficiency and stability in bad weather conditions."

The launch was designed by Breaux's Bay Craft in partnership Madisonville, La. naval architecture firm C.FLY Marine Services. "The overall size of the vessel gives the pilots more comfort with the capabilities of seating 14 pilots, one navigator and captain in Hy Back NorSap reclining seats and sleeping accommodations for four with full galley," Breaux said. The vessel features a three-ton water cooled air conditioning system for the pilothouse and another two-ton water cooled AC system for the lower accommodation, which includes two double bunk staterooms, settee seating area and a full head with shower.

"The vessel's speed, fuel efficiency and stability also make it unique," Breaux said, noting Spindletop the first quad screw jet propulsion pilot vessel built in the U.S." Powered by four Scania DI16-82M engines (800 HP at 2,100 RPM) with Twin Disc MGX 5146 gears, Centek Water lift mufflers and quad Hamilton HM461 waterjets, Spindletop cruises ay 27 knots with a top speed over 30. Its Ecospeed underwater hull coating offers improved hydrodynamic characteristics that help to enhance performance and save fuel.

TOP BOATS 2021

Breaux's Bay Craft has been building pilot boats since the early 1970s, but Spindletop is just its second with its new generation deep-V bottom. Having run for more than 38,500 nautical miles (as of October 20), Breaux said Spindletop's performance has been exceptional. "The vessel has been in service in adverse weather conditions, including 8- to 10-foot seas, and has exceeded and outperformed all expectations," Breaux said

"We went to Breaux for a custom-built pilot boat that would maximize safety and comfort for our 17 mile stretch in the Gulf of Mexico, and could not be happier with our choice," said Capt. Kenneth Leslee Hurd, boat superintendent for Sabine Pilots. "The Spindletop with its four Hamilton jets coupled to the 4,800 HP Scania engines, Humpree active ride trim tabs, and Breaux's new hull design she cuts thru our constant 3- to 4-foot chop that we run on a daily basis with ease. Another great feature from Hamilton is their new AVX (boat mouse) system that allows the operator to maneuver the vessel with ease in restricted areas."

Hurd said operator visibility during pilot transfers was a main priority when designing the new launch, adding that Spindletop's heated fritted glass windows allow the operator 360 degrees of unobstructed views at all times.

For pilot transfer operations, Spindletop has port and starboard boarding platform on both the bow and pilothouse. A combination of DB 510 D bumpers and aircraft tires surround the perimeter of vessel. For rescue assist, there's a custom-built rescue platform by SeaLift located on transom with 24V hydraulic unit, plus a transom jib pole with 120V electric winch.

Hurd expects Spindletop—Sabine Pilots' fifth Breaux built pilot boat—will be disembarking and delivering pilots to ships safely for many years to come.

Foss Maritime

RACHAEL ALLEN

A TUG WITH AUTONOMOUS CAPABILITIES

Foss Maritime's newest vessel is the first U.S.-flag harbor tug to integrate autonomous systems in real-world commercial operations.

Delivered in June, the newly built 90-ton bollard pull Rachael Allen—the fourth in a series of ASD-90 Z-drive tractor tugs built at Nichols Brothers Boat Builders, in Freeland, Wash.—features Sea Machines Robotics' SM300 autonomous-command and -control system. The system's capabilities include transit autonomy, as well as remote access of the tugboat's onboard machinery, a feature that allows personnel to manage and support operations from anywhere on board the vessel or from shore. Navigation obstacle detection and avoidance capabilities also come standard.

Tapping into the remote command and control capabilities, Foss will use its existing Fleet Monitoring Center personnel to monitor the tugboat's systems and operating domain via streaming video and sensor data. According to Foss and Sea Machines, the system enables an extra set of eyes and hands to have access to vessel command and control, allowing Foss and the Rachael Allen crew to maximize productive time, safety and crew welfare

"While we are not working on a fully autonomous tug, [the Sea Machines systems] allow our crews to use autonomous features to make their jobs safer. Our mariners are the key to our success, and we believe the Sea Machines products will help them carry out their day to day operations," said Will Roberts, president, Foss Maritime.

The Rachael Allen has been delivered with the SM300 and supporting hardware fully integrated, but the capability of the technology will be activated in stepped phases over the course of six to nine months to ensure full visibility and acceptance from all operational stakeholders. "Our work toward integrating the autonomous controls . . . continues with our partners at Sea Machines, the U.S. Coast Guard and ABS," Roberts said. "As a safety enhancement that incorporates new and novel technology, we are testing out a tool to support our crews, which comes from a system processing digital information to enhance safety of navigation. We are excited about the tools this system brings to our mariners in their service of our customers. We will work closely with regulatory agencies and third-party auditors to thoroughly vet the system as we continue to move toward full operational use of the SM300 on board."

Michael G. Johnson, Sea Machines founder and CEO, said, "While our space has seen a number of government-innovation backed prototype initiatives for autonomous tugs in Europe, Japan and Singapore, it's notable that Foss is launching the first commercially funded project in U.S. waters.

"Our technology has been in use aboard commercial vessels around the world for nearly three years and is backed up by thousands of hours of testing and validation. This is yet another real-world example of how Sea Machines autono-

my is reshaping the way work is being done by vessel crews on the water."

Sea Machines noted the Rachael Allen project marks its first installation of an autonomy system on a vessel over 5,000 horsepower. Designed by Jensen Maritime Consultants, the 100- by 40-foot tractor tug will be able to escort the largest tankers and containerships calling the U.S. West Coast ports that it will serve. The vessel is outfitted with two MTU Series 16v4000M65L EPA Tier 4 main engines, producing 6,866 horsepower and coupled to Kongsberg US255 azimuth thrusters.

The MTU selective catalytic reduction (SCR) system provides optimization of the engine delivering improved efficiencies, fuel consumption is reduced by 8% at full power and 14-22% over a wider operating range compared to previous MTU engines in this power range. The MTU engine and SCR are designed with a high focus on noise reduction, standard features such as resilient mounting, turbocharger air intake silencers and the SCR insulation and noise abatement, all combined to produce noise levels throughout the vessel without any traditional exhaust silencers. The MTU engines are also equipped with MTU Go, a MTU digital monitoring system and service that allows continuous monitoring of the engines including all engine parameters and alarms, with trending and broadcast of engine alarms through the MTU Go App.

Rachael Allen is outfitted with Mackay Marine Electronics, and towing equipment consists of a Markey DEPGF-52R winch with 750 feet of 10-inch synthetic line on the bow and a Markey DEPC-32 stern winch with 250 feet of 6.5-inch circumference line on the stern. The tug is built to U.S. Coast Guard Subchapter "M" regulatory standards, with ABS loadline certification and UWILD notation.

C&C Marine and Repair

BOWLING GREEN

A HIGH-POWER, TRIPLE-SCREW TOWBOAT

Belle Chasse, La. shipbuilder C&C Marine and Repair this summer delivered the new towboat Bowling Green to Kirby Inland Marine, L.P. The newbuild—the second in a three-boat series for Kirby, delivered six months after the first vessel Scarlett Rose Furlong —will operate it under a long-term lease from Hines Furlong Line.

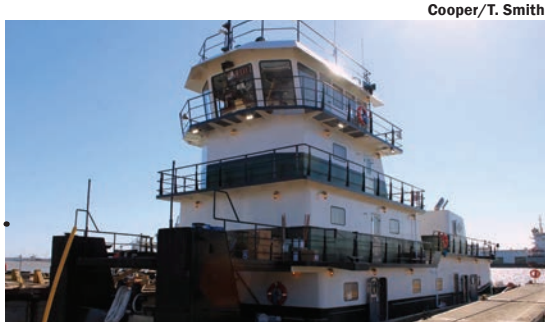
The 6,600-horsepower triple-screw towboat measures 170 feet by 50 feet with the pilot house eyeline measuring at 39 feet, three inches. Designed by CT Marine based in Portland, Maine, the vessel is powered by three Cummins QSK60-M main engines, provided by Cummins Mid-South, that are paired with three Reintjes WAF 1173 H/V reduction gears, provided by Karl Senner, LLC. The service power is provided by three Cummins QSM11-DM, 275 kW generators, and the conventional steering system HPU was provided by EMI Marine. The towboat is outfitted with three 100" diameter stainless-steel fixed pitch propellers, provided by Sound Propeller Systems, Inc, and features double steering rudder system. The accommodations include a total of 12 beds (11 crew, plus one guest), and the vessel's design includes a floating, spring mounted superstructure for additional crew comfort.

"We wanted the durability of a conventional vessel with both stellar northbound and southbound performance," Hines Furlong Line president Kent Furlong told *Marine News*. "At the same time, we fully acknowledge the superior maneuverability that Z-drives offer. With all of this in mind, we are convinced that this conventional, kort nozzled setup with the double steering rudder arrangement gets us the best of both worlds."

GRETCHEN V. COOPER

NEW TOWBOAT IS CLEAN AND GREEN

Cooper/T. Smith



The U.S.' first linehaul towing vessel powered by Tier 4 Caterpillar high-speed engines with selective catalytic reduction (SCR) was built by Blakeley BoatWorks (BBW) and is now operated by Cooper Marine and Timberlands (CMT).

In March 2021, Blakeley BoatWorks completed construction of Gretchen V. Cooper, a state-of-the-art, Tier-4 inland linehaul tow boat. This 3,400-horsepower vessel is 110-feet long, 33-feet wide and expands CMT's fleet to 20 vessels.

The vessel is powered by two Caterpillar C3512E 3,400 HP Tier IV diesel marine engines operating at 1,800 RPM and coupled to Twin Disc MGX5600 gears. The engines significantly reduce emissions of particulate matter, or black soot and nitrogen oxide, while also saving fuel. Thompson Caterpillar also supplied electrical power with two Caterpillar C4.4 Tier III generators with RW Fernstrum, Inc. keel coolers throughout. A pair of Southeastern Propeller four-blade stainless steel propellers provide thrust through two J & S Machine Works, Inc. 9-inch ABS Grade two propeller shafts with Cutlass shaft bearings, Thordon rudder bearings, and Kemel shaft seals. Gulf Coast Air and Hydraulics supplied the steering system for the two 9-inch main and four 8-inch flanking rudders.

"Our customers expect Blakeley BoatWorks and Cooper Marine & Timberlands to drive industry innovation, and our building and operating one of the industry's most environmentally friendly towboats marks our unwavering commitment to always exceed their expectations," said Angus R. Cooper III, President, Cooper/T. Smith, parent company to both BBW and CMT, headquartered in the port of Mobile, Ala. "Naming a boat after my wife Gretchen meant that we couldn't just settle for building a standard towboat, and therefore the Gretchen V. Cooper will be one of the most powerful towing vessels operating on the Tennessee-Tombigbee Waterway and will lead the way for a new industry standard for reduced emissions on towboats."

SAFE Boats International

SAFE 44 PATROL BOAT

A VERSATILE PATROL BOAT

The SAFE 44 Full Cabin – Inboard designed and built by Bremerton, Wash.-based SAFE Boats International for the U.S. Department of Defense serves as a command and control platform and performs a variety of military and scientific support missions domestically and around the world.

The ample cabin configuration with four shock-mitigating seats allows for freedom of movement and a comfortable and safe ride in rough seas. The installed Seakeeper enhances vessel stability and reduces crew fatigue. The onboard galley and head provide crew habitability during extended time away from port. The SAFE 44 Full Cabin – Inboard is just as at home in protected, inland waters as it is in rougher, offshore seas. The sturdy hull, extreme duty reinforced (XDR) collar and other standard safety features offer peace of mind unapparelled in the industry.

The SAFE 44 Full Cabin – Inboard is powered by dual Cummins QSM11 inboard diesels, with ZF 325-1 gears and drivelines as well as twin Hamilton HTX30 waterjets with 24VDC electronic controls. It is also equipped with a Westerbeke 7.6 kW diesel generator

It is equipped with a Seakeeper 7HD and Zipwake Dynamic Trim Control System, plus the vessel features a wide beam design for solid performance in heavy seas. A spacious, climate-controlled cabin offers good crew comfort and safety. The Full Cabin – Inboard's design makes it well-suited for conducting a variety of missions including command and control, general patrol, and search and rescue operations in both inland, coastal, and offshore waters.

Metal Shark

FIRE BOAT 2

A "NEXT-GENERATION" FIREBOAT

Fire Boat 2, delivered to Orange Beach Fire Rescue in Alabama this summer, is the first 38 Defiant NXT next-generation welded-aluminum monohull pilothouse vessel, a new model based on Metal Shark's popular 38 Defiant platform. Utilizing the same proven hullform as the more than 100 legacy model 38 Defiant vessels already in operation, the new 38 Defiant NXT has an entirely new topsides arrangement designed by Metal Shark's in-house engineering team.

"Redesigning one of our best-selling models at the peak of its popularity was not a task we approached lightly, but through our efforts we made significant improvements to an already outstanding platform," said Metal Shark CEO Chris Allard. "Orange Beach Fire Rescue's new 38 Defiant NXT fireboat and the multiple other fireboats now in production are a direct result of our goal to consistently offer the industry's most advanced designs through ongoing product evolution."

Orange Beach Fire Rescue's new 38 Defiant NXT is powered by twin 550-HP Cummins QSB 6.7 inboard diesels mated to Hamilton HTX30 waterjets with Blue Arrow control system via Twin Disc MG 5065 SC transmissions. This configuration enables this fully-equipped 43- by 12-foot fireboat to cruise at 30 knots and reach top speeds in excess of 40 knots while offering superb maneuverability at all speeds. The 38 Defiant NXT is available with a wide range of propulsion types and can reach top speeds of more than 50 knots when powered by triple outboards.

For firefighting, the Orange Beach fireboat delivers a flow rate of 3,000 GPM, with twin 1,500 GPM Darley fire pumps driven via PTO from the main engines. Each pump draws from its own dedicated in-hull sea chest, feeding a central manifold with crossover capability, which in turn supplies the entire system. From the fire control station at the port helm, flow is directed as desired via electronically-actuated valves. The vessel is equipped with a remote-operated Elkhart Scorpion EXM electric rooftop monitor, two Elkhart Copperhead manually operated monitors aft, dual handline outlets, and a 5-inch Storz connection.

LEONARD E. REDON

A FIREBOAT WITH ENHANCED CAPABILITIES

The new 30-foot,10-inch fireboat Leonard E. Redon entered service for the Rochester Fire Department in Upstate New York in June, greatly enhancing the agency's on water firefighting and rescue capabilities.

Among key features a roof monitor, a cockpit monitor, a 5-inch large diameter hose Storz discharge, and the ability to pump over 1,500 gallons per minute, according to California-based boatbuilder Moose Boats. The new boat also has an extended walk-around cabin configured with three shock-mitigating crew seats, an incident command/navigation station, an 84-inch patient bench with EMS storage below, and an integrated deck level head enclosure. Weather-tight deck boxes on the fore deck and aft deck will house firefighting foam and the additional valves, nozzles, tools and hardware necessary to respond to a wide range of fire and rescue scenarios. Capable of speeds up to

Moose Boats

34 knots, the vessel is powered by Cummins QSB 6.7L (850mhp at 3,000rpm) with TwinDisc 5075SC gears and Hamilton HJ292 waterjets.

Ken Royal, sales VP at Moose Boats, said, "The catamaran is an extremely stable working platform with a very wide deck plan offering much larger cabin configurations with deck level walk around capabilities. The wide separation between the two catamaran demi-hulls positions units further apart than a mono-hull, resulting in a very high level of maneuverability when cross vectoring jet streams. The reduced wetted surface area of the catamaran hull increases efficiency and minimizes wake at planning speeds with considerably less draft than a mono-hull."

Silver Ships

HUNTINGTON BEACH

CAPABLE CRAFT FOR SWIFT ASSISTS

The 30-foot rigid hull inflatable boat (RHIB) Huntington Beach, built by Silver Ships, has been custom designed and outfitted uniquely for use as an offshore marine assist and tow vessel supporting operations at TowBoatU.S. Long Beach. To extend range, the client transitioned from more traditional fiberglass boats to the Silver Ships AM800 platform. The end result is a significant increase in response range with a commensurate reduction in response time.

Powered by twin Mercury 300 HP SeaPro outboards, the RHIB is capable of speeds greater than 45 knots. Built with underwater seams that are continuously welded inside and outside and using 5086 H32 grade aluminum plates, with each bottom plate being a minimum ¼-inch thick, the AM800 vessel features an extended beam and full walk around cabin. According to Silver ships, it affords not only a safer platform to work from, but stores the capability to not only tow, jump start or drop fuel, but also perform salvage work with the on-board equipment. This equipment includes lift bags, air tanks and a gas-powered de-watering pump.

This workboat very recently helped save the lives of two mariners clinging to their submerged vessel 17 miles off the coast. "The AM800's ability to complete the tasks of multiple boats has provided our customers' company benefits beyond the scope of what they intended and the ability to engage in missions they did not expect to be executing," said Dave Hunt, business development specialist at Silver Ships.

Blount Boats

ATLANTIC ENDEAVOR

AMONG A NEW CLASS OF JONES ACT CTVS

Atlantic Wind Transfers' (AWT) newest crew transfer vessel, Atlantic Endeavor, constructed by Rhode Island shipbuilder Blount Boats and delivered in January, is just the third purpose-built CTV in the Jones Act fleet, which is needed to support the burgeoning U.S. offshore wind market for decades to come.

The specialized model of the Chartwell 24, designed by U.K.-based Chartwell Marine Ltd., was modified to comply with American environmental and USCG regulations. Andy Page, Managing Director of Chartwell Marine, noted several key differences between CTVs built for U.S. and European waters. For one, the underwater profile of the U.S. version has been modified to operate safely in wavelengths and swells along the U.S. Eastern Seaboard that are typically longer and larger than what's seen in the North Sea. From a compliance perspective, the designer also considered emissions standards variances as well as U.S. legislation protecting the migration route of the protected right whales.

The 64.9-foot Atlantic Endeavor is a twin hulled aluminum catamaran equipped with quad 799-horsepower MAN engines, Cummins generators, ZF Transmissions, HamitonJet waterjets and Humphree USA Interceptors. Its service speed is 22-24 knots, with a sprint speed of 29 knots. On deck, the CTV has 10 metric tonnes cargo capacity, and it is fitted with a Palfinger crane and Nabrico anchor winch. The vessel is also equipped with a power washing and fuel transfer system.

AWT, based in Quonset Point, R.I., is the Unite States' first owner/operator of CTVs, typically aluminum catamarans, used for transporting wind farm technicians and other personnel, and sometimes equipment, out to sites on a daily basis. Its first CTV, Atlantic Pioneer, was built by Blount Boats in 2016 and has been servicing the five 6-megawatt turbines at the Block Island Wind Farm off Block Island, R.I.

Atlantic Endeavor is based out of Virginia's Hampton Roads region under AWT's long-term O&M CTV contract with Dominion Energy to support its Coastal Virginia Offshore Wind Farm (CVOW) pilot project 27-miles off Virginia Beach. Manned by two to four crew members, Atlantic Endeavor has capacity to transport up to 24 wind farm technicians.

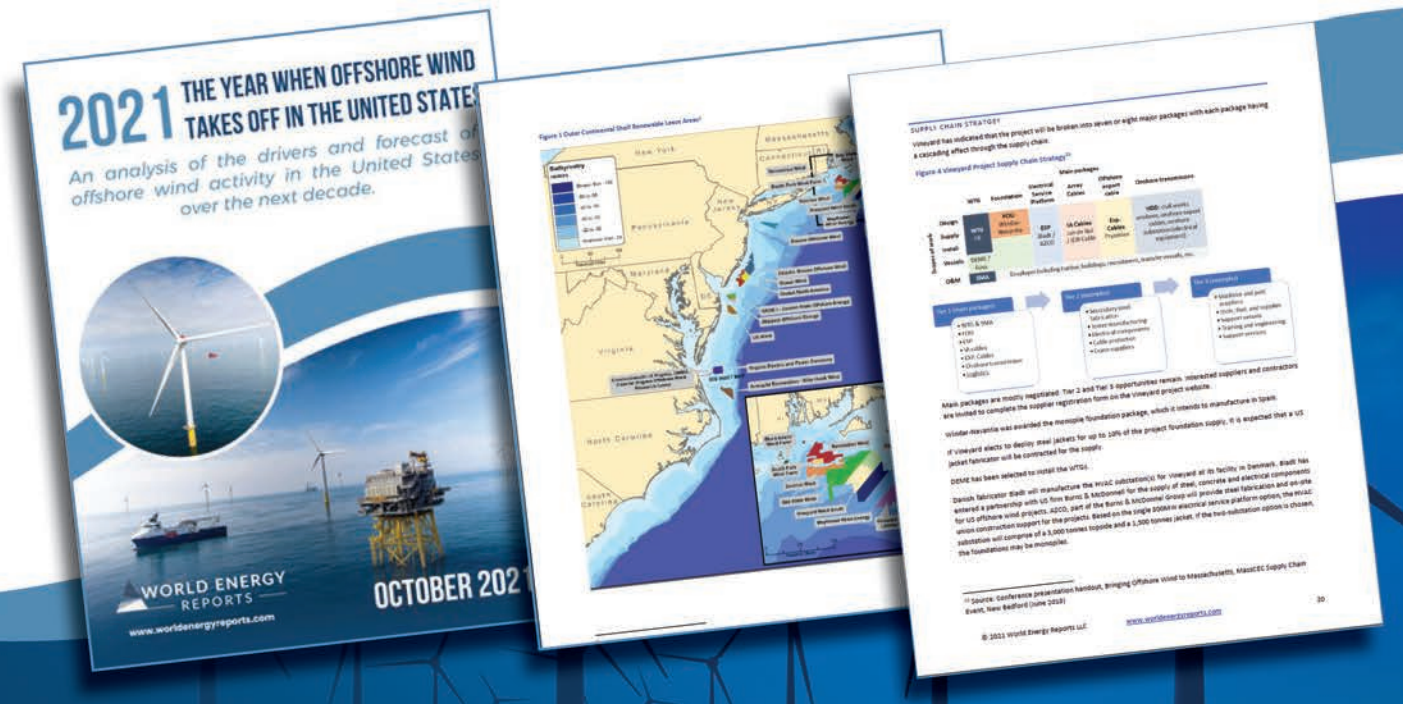
WORLD ENERGY REPORTS

2021 U.S. OFFSHORE WIND OUTLOOK

MARKET FORECAST

OFFSHORE WIND MARKET INTELLIGENCE PACAKGE

This 100-page report examines the business conditions likely to drive offshore wind project development in the US within this decade, forecasts the number, CAPEX, OPEX and timing of projects, and provides a roadmap to accessing these market opportunities.



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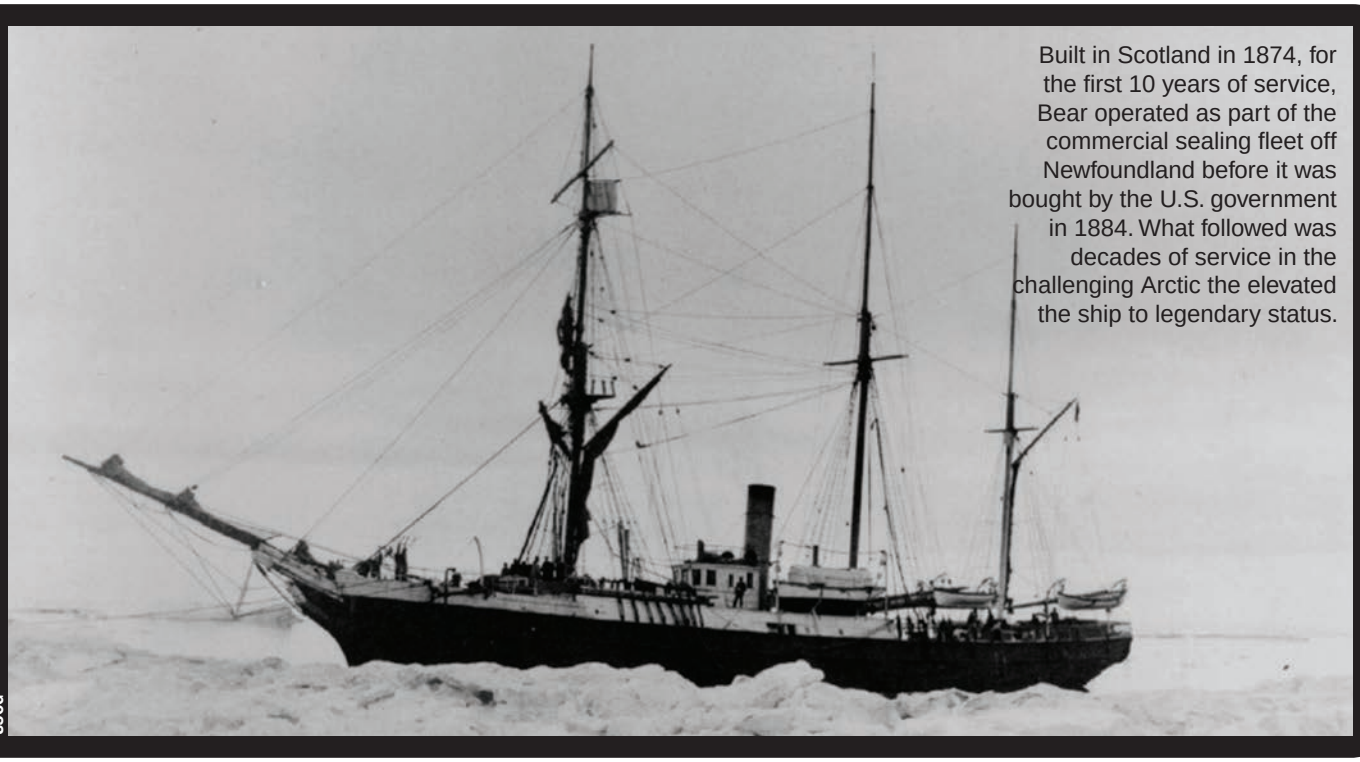


USCG

Built in Scotland in 1874, for the first 10 years of service, Bear operated as part of the commercial sealing fleet off Newfoundland before it was bought by the U.S. government in 1884. What followed was decades of service in the challenging Arctic the elevated the ship to legendary status.

Wreck of USRC Bear Found off Nova Scotia

By Eric Haun

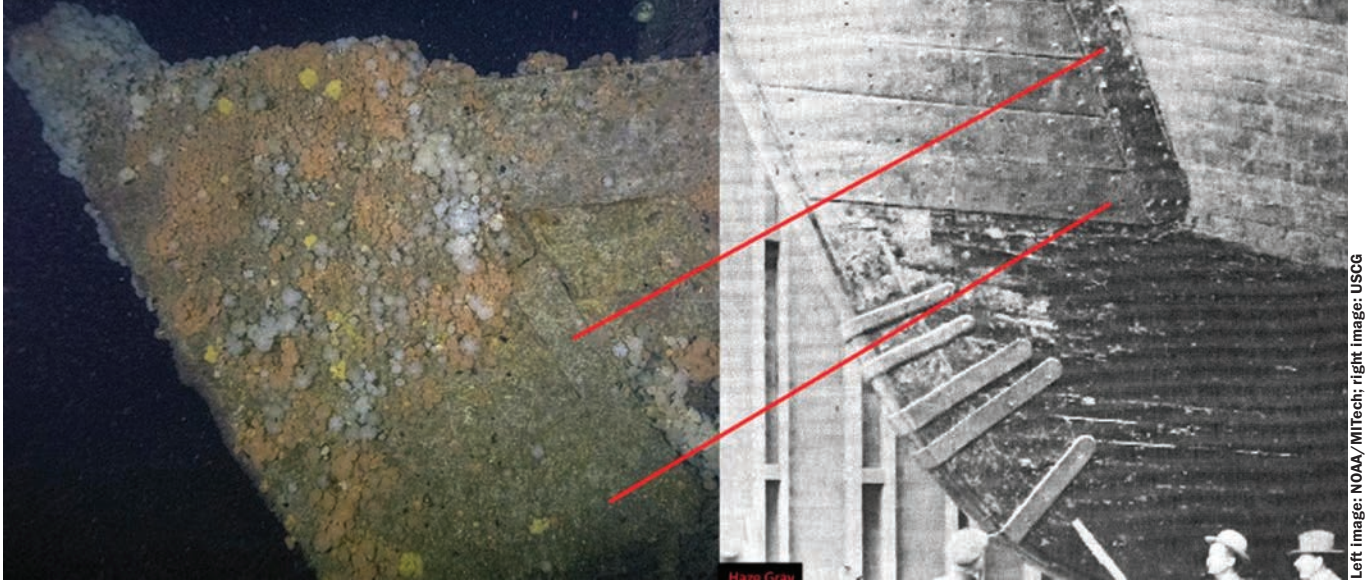
The decades long mystery of a missing U.S. Coast Guard Ship has finally been solved.

U.S. Revenue Cutter (USRC) Bear, lost at sea in 1963, has been found on the seafloor about 90 miles south of Cape Sable, Nova Scotia, NOAA Rear Adm. Nancy Hann recently announced.

Widely considered one of the most historically significant ships in American history, Bear was purchased by the U.S. government and first put into service by the U.S. Navy as part of the rescue fleet for the Greely Expedition to the Arctic in 1884, attaining legendary status for the rescue of the expedition's few survivors. The Bear was transferred from the Treasury Department for service in the Arctic in 1885 as a Revenue Cutter, and for 41 years, patrolled the Arctic, saving lives and dispensing justice in the remote and challenging region.

Many years later, and after several roles including patrol missions for the U.S. Navy during World War II, Bear was ultimately sold to an entrepreneur who planned to turn it into a museum and restaurant on the Philadelphia waterfront, but the famed ship sunk while being towed to its new berth.

A team of researchers from NOAA, USCG and partnering academic institutions have spent nearly two decades trying to



Left image: NOAA/MITech; right image: USCG

Port bow of the "unidentified wreck" imaged in 2021 on the left showing similar sheathing patterns to the historic image of USRC Bear while in dry dock in 1925.

locate the Bear's final resting place. The mission, it turns out, was quite challenging and complex.

A major breakthrough came during a side scan survey in Canadian waters in 2019, when a team from NOAA Ocean Exploration and NOAA National Marine Sanctuaries' Maritime Heritage Program, working off the USCG's medium-endurance cutter Bear (named for USRC Bear), found two targets for further exploration while mapping 62 square miles of seabed in the area near various last known positions reported during the Bear's sinking in 1963.

"One target in particular was very promising as it was in the proximity of the last known position where Bear was lost at sea in 1973, and it appeared to roughly match the dimensions of the ship," said Brad Barr, Expedition Coordinator, NOAA Office of National Marine Sanctuaries Maritime Heritage Program.

Coast Guard and NOAA researchers returned to sea earlier this year on the USCG oceangoing buoy tender Sycamore, this time with operators from Marine Imaging Technologies and a remotely operated vehicle (ROV) equipped with high-resolution underwater video cameras. Despite difficult operational conditions on site, the team was able to collect enough video and still images to provide the documentation needed for maritime archaeologists and historians to identify the historic wreck.

Key indicators highlighted as compelling evidence of the identity of the ship included the bow staple and steel sheathing configurations, multiple layers of bow planking and the stern tube bolt patterns, as well as its location close to the reported last known position and lack of other wrecks in the vicinity.

"While no feature identified in the 2021 ROV survey, by itself, would have likely been considered absolutely definitive, taken together, the body of evidence was considered, by the evaluation team, more than sufficient to identify the wreck as Bear with a reasonable degree of certainty," Barr said.

Now attention can turn toward efforts that will help preserve the shipwreck.

Barr noted that the Canadian Department of Fisheries and Oceans is considering establishing a marine protected area that would include the Bear wreck site. While not explicitly recognizing the historic importance of the shipwreck, the designation could help to alleviate any continuing damage to the wreck from mobile fishing gear, he added.

"Some joint U.S./Canadian recognition of this significant historic site might also be possible, but time will tell whether such a collaborative agreement has the potential to be developed and implemented," Barr said.

THE MARITIME NETWORK

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DMW Marine Group

DMW Knows Cranes

DMW Marine Group, in business since 1995, is strictly a marine crane company, supplying shipbuilders and shipowners throughout the global maritime sector.

Headquartered in Chester Springs, Pa., with additional manufacturing sites in Houston, Spain, Italy and Scotland, the firm tallies about 50% of its business in the U.S., according to the company's president Doug Weidner, who says he sees the market improving stateside after a prolonged industry downturn. "Right now, there are two markets in particular that have surged: offshore wind and offshore drilling."

"We know the oil and gas business very well, having delivered hundreds of cranes into that market," Weidner said. "Offshore wind is a new market, and a lot of existing oil and gas vessels are being converted for offshore wind services. Many of those doing the converting are our old customers who know our products well and are now returning to us." Weidner noted DMW recently secured two orders in the offshore wind space, including a new crane as well as a completely refurbished crane from a decommissioned drillship that's been redesigned for offshore wind.

DMW Marine Group has been supplying marine cranes of all types, to the military, offshore petroleum producers and service providers, oceanographic survey and research vessels, aquaculture, yachts, police and fire departments, etc. for over 30 years, and Weidner counts the company's longevity, track record, quality, competitive pricing and spare parts availability as key to its success. "We've been in business so long, and many of our competitors have gone out of business—especially over the past five years. The people that own our cranes know that our quality is second to none."

Over this past year, DMW has supplied marine cranes to several university research vessels, offshore wind companies, U.S. Navy contractors, megayachts and offshore oil drillers.

"Our most popular cranes are the folding knuckle booms. And we've also started building a lot of the knuckle booms that have one knuckle and totally fold up. They're very popular offshore. In fact, we're delivering two to Brazil this month (October) for offshore oil."

Weidner said that improving markets have given the company reason to build more cranes for inventory, and that having equipment in stock was crucial to securing the Brazilian contract, while another big helper came from a recent agreement with Proxima Innovation to handle business in Brazil and Latin America. Additionally, DMW has recently appointed Miami-based Technonaval as its representative in Florida, Panama, Ecuador and Greece.

Hybrid-electric CTV

Mayflower Wind

U.S. offshore wind farm developer Mayflower Wind has signed an agreement with Gladding-Hearn Shipbuilding/ Duclos Corporation of Somerset, Mass. for the specification, design and manufacture of a Jones Act-compliant, hybrid battery diesel electric crew transfer vessel (CTV). The project will proceed if Mayflower is awarded a contract under the latest Massachusetts procurement for offshore wind, and design of the vessel would occur during 2022-2023, setting the stage for building and launching the hybrid CTV in the mid-2020s, timing that would fit well with the start of operation of wind turbines by Mayflower Wind.

Incat Crowther is the designer of the vessel, which will be based upon one of its CTVs already in service in Europe and customized to suit local requirements. ABS is on board to provide design review for approval in principle, verification of applicable rules, standards and U.S. Coast Guard regulations, and classification of the CTV. BAR Technologies brings its foil optimized stability system as well as its advanced computational fluid dynamics modelling and simulation. Corvus is supplier of its onboard battery energy storage solution.

"Mayflower Wind aims to develop the most innovative, fuel-efficient CTV built in the United States," said Michael Brown, CEO of Mayflower Wind. "Ensuring that this vessel is constructed at a shipyard in Somerset is a big boost to the Massachusetts maritime economy and launches this shipyard toward a new and growing market."

Sentinel-class Fast Response Cutters

Bollinger Shipyards

Bollinger Shipyards has delivered the newest Sentinel-class Fast Response Cutter (FRC), USCGC John Scheuerman, to the U.S. Coast Guard in Key West, Fla. nearly one week ahead of schedule despite a three-week shutdown due to the significant damage sustained to Bollinger's facilities during Hurricane Ida. On September 24, following an extensive multi-week recovery and rebuilding effort, Bollinger welcomed employees back to all 11 of its facilities across Louisiana. Bollinger's Lockport facility is home to the FRC program, which directly supports 650 jobs. The USCGC John Scheuerman departed Lockport on October 11 for Bollinger's Fourchon facility where it performed a shakedown exercise prior to dry docking for final inspection in preparation of its delivery. The Cutter departed Fourchon for Key West on October 17.

Days earlier, on October 15, Bollinger joined U.S. Coast Guard officials at USCG Sector Delaware Bay in Philadelphia, Pa., for the commissioning of another new Sentinel-class FRC, USCGC Emlen Tunnell, delivered to the USCG in July.

USCGC Emlen Tunnellin and USCGC John Scheuerman are the 168th and the 169th vessels Bollinger has delivered to the U.S. Coast Guard over a 35-year period and the 45th and 46th FRCs delivered under the current program. They are the fourth and fifth of six FRCs to be home-ported in Manama, Bahrain, which will replace the aging 110' Island Class Patrol Boats, built by Bollinger Shipyards 30 years ago.

T-ATS

U.S. Navy

The U.S. Navy awarded Austal USA a $144 million two-ship Towing, Salvage, and Rescue Ship (T-ATS) detailed design and construction contract October 5.

T-ATS will provide oceangoing tug, salvage and rescue capabilities to support U.S. fleet operations and will be a multi mission common hull platform capable of towing heavy ships. These ships will be able to support current missions, including oil spill response, humanitarian assistance, and wide area search and surveillance. The platform also enables future capability initiatives like modular payloads with hotel services and appropriate interfaces.

This award follows the Navy's $3.6 million T-ATS functional design contract awarded to Austal USA in June. The shipbuilding contract award marks the first steel new ship construction program for the company under its new state-of-the-art enclosed steel production facility. Austal USA broke ground on its $100 million steel manufacturing facility in March 2020. The line will be ready to cut steel in April.

The T-ATS award is one of several steel shipbuilding programs the company is pursuing as it diversifies its capabilities. Austal USA previously announced it submitted a bid to build the U.S. Coast Guard's Offshore Patrol Cutter and continues to execute a Light Amphibious Warship concept studies and preliminary design contract for the Navy and Marine Corps. Austal's new steel line and facility expansion also positions it well to be the follow-on Frigate yard for the U.S. Navy.

Harvey Power

Harvey Gulf International Marine

U.S.-based offshore vessels owner Harvey Gulf International Marine has taken delivery of its second tri-fueled platform supply vessel. The 310-foot Harvey Power is equipped to run on liquefied natural gas (LNG), electric battery power, and ultra-low sulphur diesel, but will be primarily operated utilizing only LNG and battery power.

Harvey Gulf said it has three additional PSVs being retrofitted with batteries to make them tri-fueled, yielding a fleet of five tri-fueled vessels. Conversion for the final three vessels is expected to be completed by March 31, 2022.

The Harvey Power is also being outfitted with an emissions monitoring system that will allow the company to track the vessel's emissions in real time. The system will provide data showing reductions in emissions from utilization of LNG as single fuel source, as well as combined fuel sources using LNG and battery power and diesel and battery power.

Mk VI Patrol Boats

SAFE Boats International

Bremerton, Wash. boat builder SAFE Boats International has 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 additional vessels.

This contract will provide Mk VI Patrol Boats to Ukraine via a U.S. State Department-approved agreement utilizing Building Partner Capacity (BPC) and Foreign Military Financing (FMF) funds. Work will be performed in Washington State and SAFE Boats expects to increase their workforce by creating up to 75 new positions, primarily at their Tacoma facility. Final delivery on the contract is slated for March 2025, or March 2026 if the option is exercised.

Propelled by HamiltonJet waterjets and twin, 2,600 horsepower, MTU 16V 2000 series diesel engines (5,200 horsepower total), the 85-foot-long Mk VI Patrol Boat has a range of 600+ nautical miles, a cruising speed of 25+ knots with a sprint speed of 35+ knots, and a draft of 4.5 feet, making it ideal for littoral operations.

Muddy Water Dredging

DSC Dredge

A newly formed dredging company has placed an order for what will be one of the largest dredges of its kind in the U.S. On October 12, Michael Kerns, President and CEO of Muddy Water Dredging, LP and Bob Wetta, President and CEO of DSC Dredge LLC, launched the project to build the custom 24" dual pump Marlin Class dredge to maintain U.S. navigable waterways. The custom-designed diesel-electric dredge, with a total installed horsepower of 9,621 HP and delivering 6,830 kW of electrical power, is expected to be completed October 2023.

The Marlin Class dredge will have an overall length of 371 feet making it one of, if not the longest, 24" dredge in the United States with the capability of dredging a 400' wide cut utilizing an 80° swing arc thus increasing the dredge's swing/advance efficiency by 5.9%. At a duty point of 28,236 GPM slurry volume, this new dredge will have the ability of filling an Olympic size swimming pool with dredge slurry in only 23 minutes and can completely fill an area the size of the New Orleans Superdome in only 23 days.

Notwithstanding the massiveness and strength this dredge embodies, its customization not only includes a detachable carriage barge which allows the dredge to quickly convert from a wide cut format configuration to a shorter conventional dredge configuration for work in areas with limited space but also has lay-down carriage barge spuds to facilitate transit under low clearance structures.

People & Companies

Phillips Tapped to Lead MARAD

President Joe Biden intends to nominate Ann Phillips to serve as Administrator of the U.S. Maritime Administration (MARAD) at the Department of Transportation (DOT), the White House announced in mid-October. The position has been vacant since Mark Buzby resigned from the role in the wake of the insurrection at the U.S. Capitol in January.

If confirmed, Phillips, a retired U.S. Navy rear admiral and currently the first Special Assistant to the Governor of Virginia for Coastal Adaptation and Protection, would take over as head of the DOT's maritime agency amid significant shipping and supply chain disruption.

In the White House's announcement, Phillips is described as "a leader in the field of coastal resilience and climate impact on national security at the regional, national and international level". She is currently working to address rising waters and climate impact to federal, maritime and other critical coastal infrastructure assets across Virginia.

Phillips previously served nearly 31 years on active duty in the U.S. Navy, retiring as a Rear Admiral. Her final Flag command was as Commander, Expeditionary Strike Group TWO, including 14 ships and 10 subordinate commands – all the Amphibious Expeditionary Forces on the East Coast of the United States. Earlier she served on the Chief of Naval Operations' Staff as Deputy Director and then Director of Surface Warfare Division, had the honor to commission and command USS Mustin (DDG 89), and to command Destroyer Squadron 28.

Murdaugh

Vieweg

Starr

Costanzo

Austal USA Names Murdaugh President

Rusty Murdaugh has been named president of shipbuilder Austal USA, effective September 9, 2021. Murdaugh joined Austal USA in 2017 as CFO, and has been serving as interim president of the company since Craig Perciavalle resigned as president in February 2021.

Palmer Named Inmarsat Maritime President

Mobile satellite communications company Inmarsat announced that Ben Palmer OBE will join the company as president of its maritime business unit on November 8, 2021.

Sea Machines Hires Vieweg as CTO

Sea Machines has hired Trevor Vieweg as chief technology officer, a new position with responsibility for the company's overarching technology strategy, as well as continuing to develop a team focused on the development of advanced marine technology.

Kirby Names Kumar EVP & CFO

Raj Kumar will join Kirby Corporation as executive vice president and chief financial officer in November 2021, succeeding Bill Harvey, who will stay on as executive vice president until his retirement date in early 2022 to help ensure an orderly transition.

Fairbanks Morse Names Starr CFO

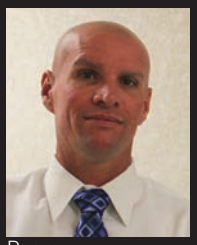
Power and propulsion solutions company Fairbanks Morse Defense (FMD) announced that Robert Starr is joining the executive team as chief financial officer.

Costanzo Joins Puget Sound Pilots

The Puget Sound Pilots have hired Charles Costanzo as executive director. Costanzo previously worked for over a decade at The American Waterways Operators, where he served as general counsel and VP for the Pacific region.

People & Companies


Patti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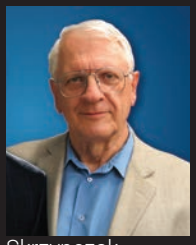
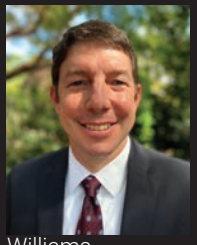
Hamilton


Skrzypczak


Crowley RI Offshore Wind


Wesson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Marshall


Messina


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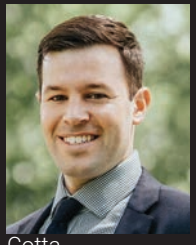
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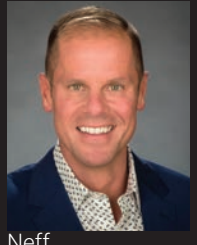
Neff


McNeel

International Propeller Club Names Patti President

The International Propeller Club of the United States elected C. James Patti as its new International President at its 95th Convention and Port President's meeting.

Boren to Lead BOEM's Pacific Office

The Bureau of Ocean Energy Management (BOEM) announced Doug Boren has been appointed as the new regional director for the agency's Pacific Office in Camarillo, Calif. Boren will be responsible for managing the development of energy and mineral resources on the U.S. Outer Continental Shelf (OCS) offshore California, Oregon, Washington and Hawaii.

Thordon Announces Leadership Changes

Thordon Bearings appointed Anthony Hamilton as its new technical director to lead the company's engineering, CAD, and new product development teams. Thordon has also selected Michael Skrzypczak to oversee the company's global service and support division, as part of the company-wide restructure. An internal reorganization has seen the promotion of Jeffrey Butt to Business Development Manager – Navy and Coast Guard; Jason Perry to Regional Manager – North America; Yves Silva to Regional Manager – LATAM; as well as the appointment of Danny Caffa to Business Development Manager – Marine (EMEA); and Heiko Pohland to Business Development Manager – Marine (Asia/Pacific).

Crowley Opens RI Offshore Wind Office

Crowley Maritime Corporation on Thurs-

day opened a new Rhode Island office for its New Energy division, to advance the development and operation of offshore wind energy installations.

Cox Appoints Wesson as COO

Diesel outboard engines manufacturer Cox Marine has appointed Gavin Wesson as its new chief operating officer.

Phoenix Promotes Williams

Marine services contractor Phoenix has promoted Chris Williams to the position of Vice President, Manned Operations.

Marshall Named Ecochlor CEO

Ballast water treatment systems manufacturer Ecochlor, Inc. appointed Andrew Marshall as CEO, replacing Steve Candito, who will continue to support the company as a senior advisor to the Ecochlor board of directors and leadership team

Crowley Names Messina M&A VP

Crowley Maritime Corporation announced it has appointed Massimo Messina as vice president, mergers and acquisitions.

OMSA Forms Workforce Development Committee

The Offshore Marine Service Association (OMSA) announced the formation of the OMSA Workforce Development Committee as the trade group's members work to secure a sufficient number of mariners for their current operations, increased activity in traditional offshore markets, and the new offshore wind market.

HII Hires Holmess as EVP

Huntington Ingalls Industries has named Stewart Holmes executive vice president, government and customer relations, succeeding Mitch Waldman, who retired on September 30.

Mayflower Wind Hires Cotta

Massachusetts offshore wind developer Mayflower Wind announced it has hired Will Cotta as its supply chain manager.

Hamilton Named JAXPORT Board Chair

The Jacksonville Port Authority (JAXPORT) Board of Directors selected new officers during its monthly meeting on September 27, unanimously electing financial services executive Wendy O. Hamilton as Chair.

Ian-Conrad Bergan Rebrands as Bergan Marine Systems

Ian-Conrad Bergan, LLC.—a marine equipment manufacturer for over 45 years—announced the company's rebrand, new leadership and new direction. Rebranding as Bergan Marine Systems under new president and CEO, Kyle Durden, the company will expand its focus to include electronic and computer controls, as well as cloud-based solutions for marine data systems, along with continuing their traditional products.

Brunswick Promotes Neff, Stickler

Brunswick Corporation announced Kris Neff has been named Boston Whaler president, and Nick Stickler has been appointed vice president of category management and strategic planning at Mercury Marine.

New Deputy Port Directors at Port of Brownsville

The Port of Brownsville has appointed two new deputy port directors. Melinda Rodriguez is the deputy port director of administration and will oversee the port's HR, real estate services, finance, comms and administrative services departments. Arturo Gomez joins the port staff as deputy port director of operations, responsible for the port's engineering, cargo services and FTZ, police and security, and facilities maintenance departments as well as the harbor master's office.

Jo-Kell Acquires ATS

Jo-Kell Inc. has completed its acquisition of industrial electrical and automation products distributor Advanced Technical Sales (ATS). ATS will continue to operate under their name as a division of Jo-Kell, now with expanded services and products available.

Raritan Hires McNeel

Raritan Engineering has hired Patrick McNeel as a marine equipment product developer.

Products

1 Wilson & Hayes
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2 In-Mar Solutions

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4 Force Technology

5 Ergodyne

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3. Containerized ESS

ABB has res developed Containerized ESS, a complete, plug-in solution to install sustainable marine energy storage at scale, housed in a 20-foot high-cube ISO container and ready to integrate with the vessel's main power distribution system. All batteries, converters, transformer, controls, cooling and auxiliary equipment preassembled in the self-contained unit for 'plug and play' use, suitable for integration on board a wide variety of ships. OSVs, for instance, would particularly benefit from a self-contained solution, as the electrical room space on board is especially limited.

4. SimFlex Cloud

Force Technology has launched SimFlex Cloud, a dedicated cloud-based SaaS solution using augmented and virtual reality with instructor-led and self study programs to offer realistic, flexible navigation training. The solution provides global onshore and onboard access to Force Technology's SimFlex simulator and the Den-Mark simulator engine and model library. It also offers access to next generation mixed reality simulation, using both VR and AR headsets to maximize realism and immersion.

5. Skullerz Safety Helmet

Ergodyne's new Skullerz Safety Helmets feature built-in Mips (multi-directional impact protection system) technology to protect workers from angled impacts. Available in Class C and Class E, the new safety helmets are integrated with a low-friction layer that slides multi-directionally to redirect rotational energy that otherwise could be transferred to the head upon falling or impact.

UNITED STATES POSTAL SERVICE®

Statement of Ownership, Management, and Circulation (Requester Publications Only)

1. Publication Title	2. Publication Number	3. Filing Date
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Managing Editor (Name and complete mailing address)

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The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes:
☑ Has Not Changed During Preceding 12 Months
☐ Has Changed During Preceding 12 Months (Publisher must submit explanation of change with this statement.)

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b. Legitimate Paid and/or Requested Distribution (By mail and outside the mail)	(1)	Outside County Paid/Requested Mail Subscriptions stated on PS Form 3541. (Include direct written request from recipient, telemarketing, and Internet requests from recipient, paid subscriptions including nominal rate subscriptions, employer requests, advertiser's proof copies, and exchange copies.)	10102	11839
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	(4)	Requested Copies Distributed by Other Mail Classes Through the USPS (e.g., First-Class Mail®)	84	88
c.		Total Paid and/or Requested Circulation (Sum of 15b (1), (2), (3), and (4)) ▶	10186	11927
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e.		Total Nonrequested Distribution (Sum of 15d (1), (2), (3) and (4))	86	45
f.		Total Distribution (Sum of 15c and e) ▶	10272	11972
g.		Copies not Distributed (See Instructions to Publishers #4, (page #3)) ▶	219	303
h.		Total (Sum of 15f and g)	10491	12275
i.		Percent Paid and/or Requested Circulation (15c divided by 15f times 100) ▶	99.2%	99.6%

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16. Electronic Copy Circulation — Marine News	Average No. Copies Each Issue During Previous 12 Months	No. Copies of Single Issue Published Nearest to Filing Date
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c. Total Requested Copy Distribution (Line 15f) + Requested/Paid Electronic Copies (Line 16a) ▶	25248	29206
d. Percent Paid and/or Requested Circulation (Both Print & Electronic Copies) (16b divided by 16c × 100) ▶	99.7%	99.8%

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17. Publication of Statement of Ownership for a Requester Publication is required and will be printed in the November 2021 issue of this publication.

18. Signature and Title of Editor, Publisher, Business Manager, or Owner: Kathleen Hickey
Date: 9/28/2021

I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested on the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

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

VESSELS FOR SALE / BARGES FOR RENT

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Marine Marketplace

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25	Scania, USA Inc.	www.scaniausa.com	(210) 403-0007
11	Sennebogen LLC	www.sennebogen-na.com	(704) 347-4910
7	Thordon Bearings	www.thordonbearings.com	Please visit our website
1	United States Marine, Inc	www.usmi.com	(228) 679-1005

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