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Volume 34 • Number 6

Marine News

JUNE 2023

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Interview
ACBL CEO Mike Ellis

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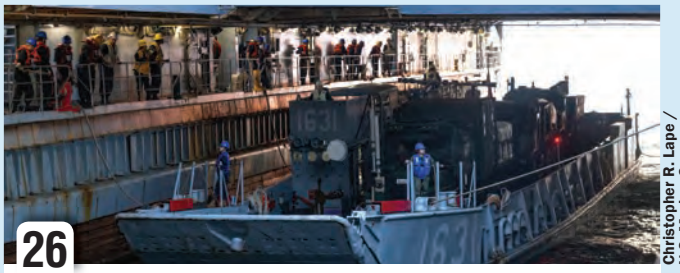
Contents

Features

Ocean Infinity



Christopher R. Lape / U.S. Marine Corps

USACE

On the Cover

"Surf drill practice", by John Deckert. A U.S. Coast Guard motor lifeboat crew enters the off Salman Creek Beach near Coast Guard Station Bodega Bay, Calif. The image appears courtesy of the U.S. Coast Guard Art Program Collection in Washington, D.C., which uses fine art as an outreach tool for educating diverse audiences about the U.S. Coast Guard.

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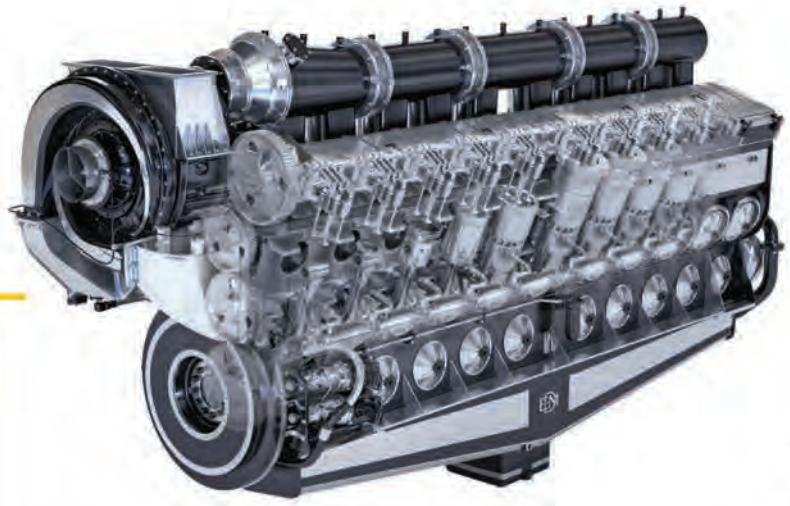

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Editor's Note

Eric Haun, Editor,
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Sometimes, after conducting an interview for an article, I find myself wondering, "How can I possibly fit all of this into one story?" When an interviewee is generous with their time, expertise and insights, I want to include as much as possible in print. This recently happened when I had the opportunity to speak with Mike Ellis, CEO at American Commercial Barge Line. He provided me with enough material to write at least 10 stories! However, I did my best to condense everything into a single piece for the Insights section of this edition. In our conversation, Ellis discusses the top challenges that ACBL and the barging industry as a whole are facing. We delve into the dynamics of the market and the ongoing process of consolidation. Additionally, we explore the need for and concerns surrounding technological advancements in the industry, among several other topics. The story starts on page 10.

This month's cover is one of my favorites, generously shared courtesy of the U.S. Coast Guard Art Program Collection. Our cover story, written by Edward Lundquist, provides an overview of the ongoing shipbuilding programs aimed at strengthening the fleets of small craft for the United States' Navy, Coast Guard and other sea services. While warships and larger vessels tend to dominate media coverage and attention, it's important not to overlook the crucial role played by smaller vessels such as patrol and rescue boats. These unsung heroes of the sea contribute significantly to safety, security and protection in both domestic and international waters.

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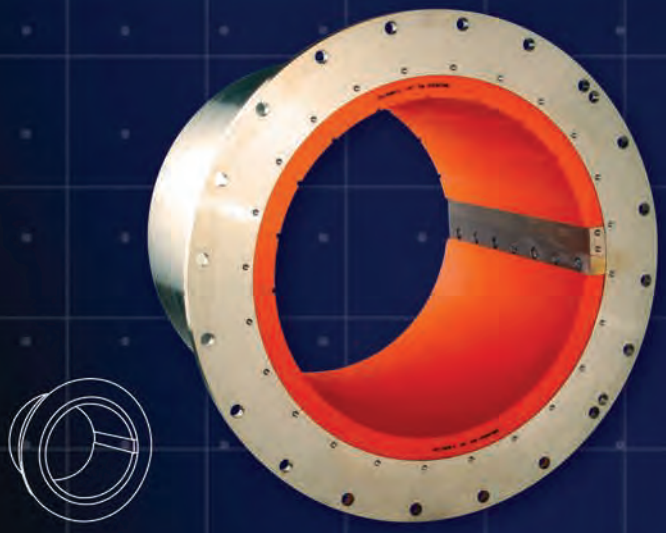

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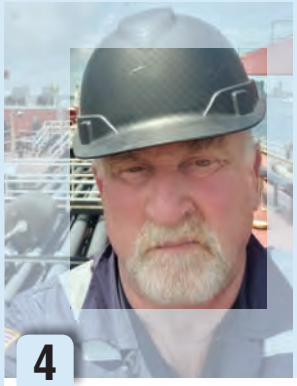
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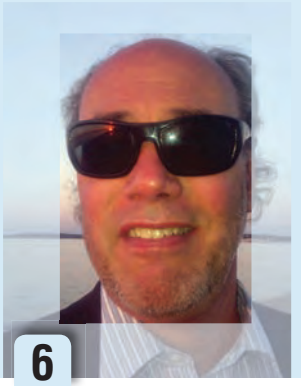
6


7

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By the Numbers

Shipbuilding Contributes to Higher Costs in US Offshore Wind

By Eric Haun

Higher shipbuilding costs are contributing to greater overall project costs in the U.S. offshore wind industry, according to maritime and offshore consultancy Intelatus Global Partners.

The United States will rely on a large fleet of foreign and domestic vessels as it builds up toward the Biden Administration's target of 30 gigawatts (GW) of offshore wind capacity by 2030 and 110 GW by 2050. This fleet will consist of both existing and newbuild tonnage, including wind turbine installation vessels (WTIV), subsea rock installation vessels, service operation vessels (SOV), crew transfer vessels (CTV) and tug and barge spreads, among others.

While vessels such as WTIVs can be foreign flagged and fed by domestic feedering solutions, others such as SOVs, CTVs and tugs will need to be built in the U.S. to comply with the Jones Act, which requires vessels transporting cargo between two U.S. points to be American-built, -owned, -registered and -crewed.

But the price to build these vessels in the U.S.—where labor costs are only expected to increase—is considerably higher than it is for those being built in Asia and Europe. According to Intelatus, the price for a newly built Jones Act-compliant SOV comes with a 40% to 140% premium compare to SOVs being built for Europe.

"[This] coincides with U.S. offshore wind projects such as South Fork and Vineyard Wind looking at project CAPEX of around $4,500 to $5,500 per kilowatt (kW), some 30% to 50% higher than those of European projects," Intelatus said.

The firm said heightened vessel pricing in the U.S. "will have a significant impact" when considering the quantity of required vessels as part of the bigger picture.

"To date, developer construction and operations plans and announcements indicate a market potential of more than 10 SOVs charted for long-term operations and maintenance support in the United States. Subject to cluster-

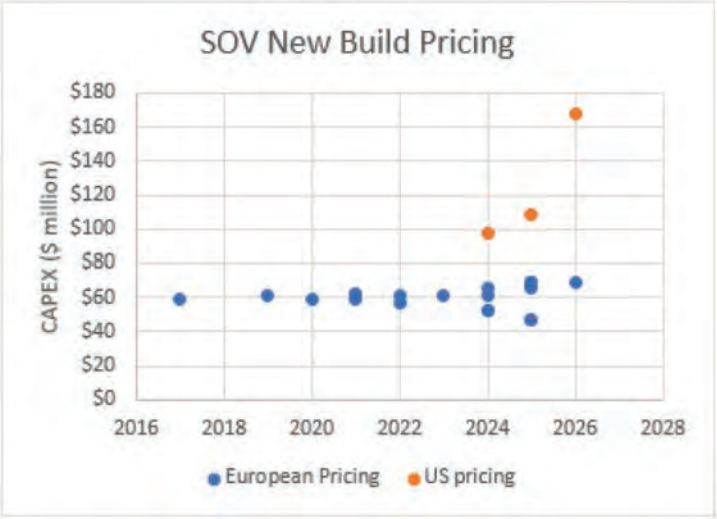
EXHIBIT 1 SOVs Seeking Title XI Financing

SOVs with applications currently pending for financing under the U.S. Maritime Administration's (MARAD) Title XI financing program. Intended to help facilitate more offshore wind vessel construction, Title XI provides credit loans at longer terms and lower interest rates than traditional private loans.

Vessel	Vessel Owner/ Shipyard	CAPEX (million)	Loan %
ECO Edison	ECO / Tampa Ship LLC	$97.15	93%
TBN	ECO / LaShip LLC	$108.75	88%
TBN	Crowley SOV I / Fincantieri Bay Shipbuilding	$167.84	87%
Total		**$373.74**	

Source: Intelatus Global Partners interpretation of MARAD data

EXHIBIT 2 SOV CAPEX *Price comparison of SOVs being built for the European and U.S. offshore wind industries.*



Source: Intelatus Global Partners

ing approaches analyzed in our reports, operator demand for SOVs is forecast to grow to significantly more than 20 units by 2035, with turbine manufacturers also chartering several SOVs."

While the U.S. federal government has put in place several programs to aid developers and their supply chain partners amid rising costs, Intelatus said there are still questions about their impacts.

For example, the Inflation Reduction Act of 2022 (IRA) contains a new 10% tax credit for the domestic production of offshore wind vessels. "We understand that the implementation is still being considered, and doubts remain about whether shipowners will see lower vessel pricing as a result of these tax incentives," Intelatus said.

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Mike Ellis

CEO, American Commercial Barge Line

***Mike Ellis**, ACBL's CEO since August 2020, is well-known in the U.S. maritime industry. He was previously executive VP and marine group leader at Savage Services Corporation until Savage sold its inland business to Kirby in April of 2020. Prior to joining Savage, Ellis was president, board member and part owner of Settoon Towing, and before that he held various leadership positions with Bollinger Shipyards, including EVP/CFO and EVP/COO. Ellis has a Bachelor of Science degree in accounting from LSU and currently serves on the board of directors for the American Waterways Operators.*

By Eric Haun

ACBL

There is no shortage of challenges confronting the U.S. barging industry, and executives such as Mike Ellis, CEO at American Commercial Barge Line (ACBL), are leading their companies past hurdle after hurdle. The Jeffersonville, Ind.-based company, which owns a fleet of approximately 150 towboats and moves a fleet of some 4,500 barges (including roughly 4,000 owned), is focusing on factors it can control while planning and investing for the future.

The weather

Mother Nature is often unkind to the barging industry. Water levels have received a lot of media coverage, especially amid last year's historic lows, but Ellis said fog is frequently overlooked as a major weather-related disruptor. "Fog has probably been the one that gets the least amount of attention, yet may cause the most inefficiencies because you just can't run in those conditions. It's dangerous."

Ellis said the "continued onslaught of 100-year weather events that we seem to have every year" continue to wreak havoc on commercial navigation. "The extreme weather has been difficult. It's made it difficult to navigate, it's made it difficult to be efficient, and difficult to keep our commitments, because capacity is restricted when these weather events occur, whether it's extreme high water, extreme low water or icing."

Still, the U.S. inland waterway system is the most efficient waterway system in the world, boosting the competitiveness of American imports and exports, Ellis said. "The inland river system is vital to our country's economic dominance, and we have to continue to support it," he said. "We have come together and recognize the need—not just the industry, but Congress as well—to better fund [river infrastructure]. . . We have funded our infrastructure to be able to repair and operate locks and dams very well. But what we haven't done is given the U.S. Army Corps of Engineers enough money so they can be more proactive in dredging."

Due to budgetary constraints, the Corps has had to be largely reactive in its dredging operations, moving assets where needed when low water events occur. But, if funded properly, the Corps would be able to shift to a more "systematic, proactive way of dredging". Ellis said. "It can be done."

It's also important that the U.S. Coast Guard continue to be able to mark channels, Ellis said, noting that this has been a bit of a struggle as the agency awaits its new buoy tenders.

"There are a lot of things going on that will help [the industry deal with extreme weather events]. The industry is aware, and we're working together. There's no disagreement in what we need to do, and there's not even a disagreement in terms of funding today, Ellis said. "Our industry is doing what we need to do collaboratively and responsibly to make sure that we mitigate these extreme conditions."

Workforce woes

The industry's top challenge, Ellis said, is a people problem. "The most pressing issues we have is our continued shortage of qualified personnel we need to run our boats and to run the business. It's probably the most pressing need of the industry as a whole," he explained. "There's been so much demand on people. It's been harder to get people in the door, harder to choose a career on the water for these young adults coming out of either high school or college. So, we've had to make a lot of changes to our business to attract the people we need to attract."

A challenge the industry faces is that the work is both physically and mentally demanding in nature, which can be a turn-off for some. That is to say companies need to find

and retain the right type of people. "We have to run the business safely, and we have to have qualified people that are willing to make a career in this business. But 28 days on and 28 days off—that's probably our most popular schedule—it's not for everyone," Ellis said. "We can't pay our way and hire our way out of this. We have to train our way out of this. We have to invest in the future of our people, by continuing to train and keep a pipeline of qualified mariners ready to step up to that next position when we have either a retirement or someone leaving the industry for some other reason. That is something our industry works on as a whole, and we spend a lot of time working at ACBL to make it the most attractive place for mariners who want to start a career."

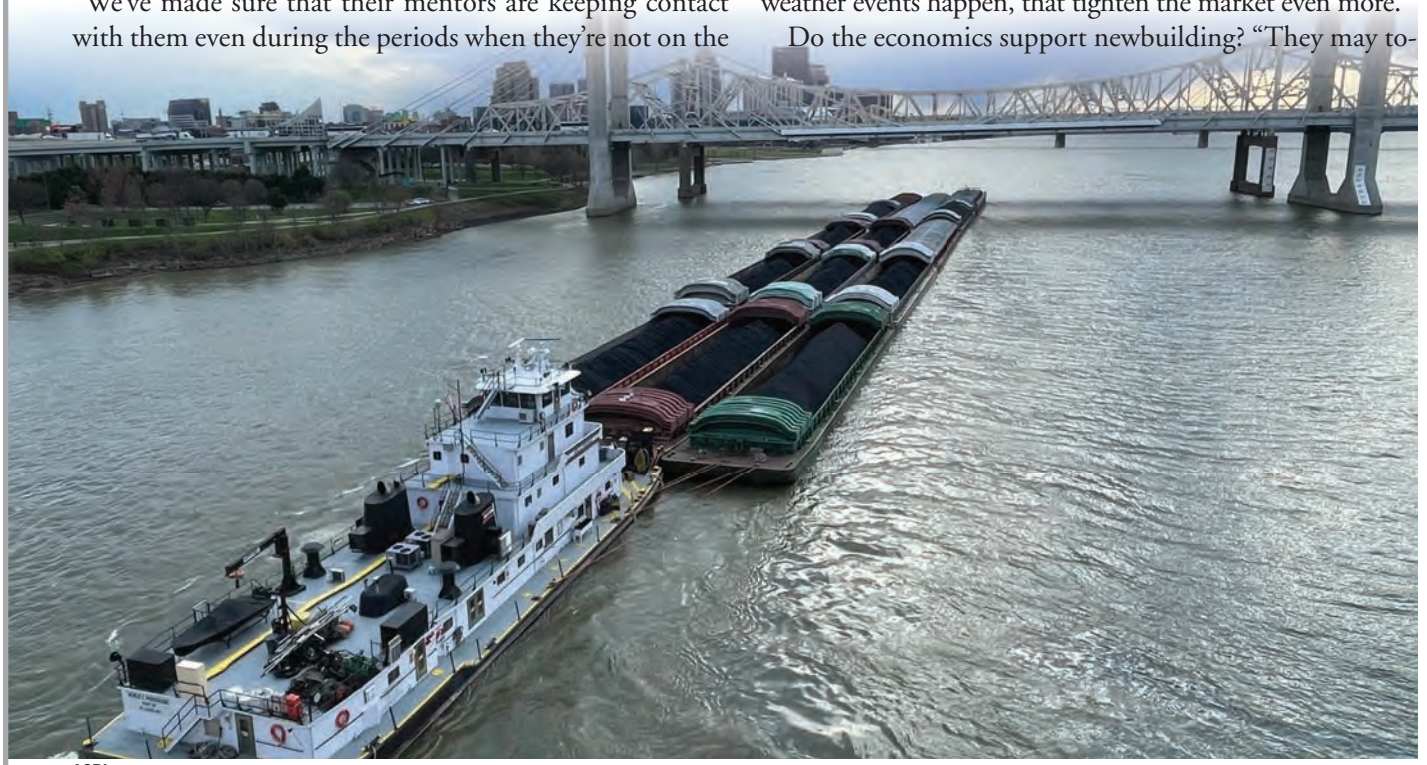
Ellis said ACBL has seen its flow of applicants grow after the company expanded its search efforts beyond the areas it has traditionally pulled talent from, tapping into areas hit by slowdowns in other industries. "We've had to go out and find those applicants. It didn't just happen," Ellis said. "It's been a team effort to go to those communities where we could be most effective."

ACBL has also had great success through in-company mentorships for its new hires, with the aim to help the next generation meet their goals and advance their careers. "We've made sure that their mentors are keeping contact with them even during the periods when they're not on the boat," Ellis said. "We like to say the biggest asset someone has to invest is their time, and we're very cognizant of the fact that their investment needs to pay returns. We are doing more to fulfill their mentorship, help them advance faster. The faster you advance, the more money you make, obviously, but also the quicker you can get to the position that's your goal, whether it's in the wheelhouse or the port captain, come onshore. There's a lot of different opportunities, and having that mentor and that career path are important. And we find that as we've been more proactive in that effort, our retention rates have gone up."

Navigating the market

The barging industry has been stronger of late than it was say five years ago. "Demand has been strong, and supply has been somewhat limited or shrinking," Ellis said. "And severe weather events, as bad as they are, tend to constrict supply even more. When you're running a low water at 40 to 50% of the barges you normally carry on a boat or a tow, that does a lot to the cost, but it also decreases your capacity as an industry, because you only have so many boats, and if you're only carrying half the barges on those boats, that affects the overall supply that we can bring to the market. So, when these weather events happen, that tighten the market even more."

Do the economics support newbuilding? "They may to-



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day, but history will tell you that today doesn't pay for that 30-year bond, or that 30-year boat. It takes a long period of time to pay those assets back," Ellis said. "Hopefully we continue to see that supply versus demand at equilibrium to where there is a decent return for our market to build new equipment. Because eventually we're going to have to build new equipment—the industry, not just ACBL."

"We operate a lot of equipment, obviously, and have to continually add, even continually build, both barges and boats to replace assets that are retiring. . . Our plans are to periodically add so many barges and so many boats per year to take care of attrition, but it won't happen evenly over that period," Ellis said. "There are different ways for us to keep our optimal fleet size of barges. One way is to build and one way is to buy on the market. We still feel consolidation is important in this industry, and it needs more consolidation."

Asked about the company's potential consolidation plans, Ellis said ACBL tends to focus on areas where it is most efficient. "We think we're very efficient with our mainline system in moving chemicals south and from the Gulf Coast up north and vice versa," Ellis said. "But they run a 10,000-barrel margin. So, you'll see a concentration of our efforts there."

And on the dry side, Ellis said ACBL will continue to look for acquisitions that support its business, such as "boat-short" companies with many more barges than towboats. "That fits our profile pretty well because we have a great repertoire of boats and horsepower, and we're probably going to be looking more to replace or add barges than we are boats."

ACBL is also exploring growth potential in nontraditional areas. "We're always looking for new opportunities for our industry. One of the ones that's been thrown around in our industry, the inland waterway system, is containers on barge," Ellis said. "But it has to be supported from an infrastructure standpoint to be able to efficiently trans-load these containers at different ports up the Mississippi, up our waterway system. Until that happens, it is somewhat limited, but it is gaining more and more momentum."

"Anytime you can use existing barges or boats, even if you have to build some new equipment, to add to the amount of traffic and the amount of goods we'll bring in on the inland waterway system, it helps support our business."

Green questions

ACBL currently has several new vessels under construction, including a mighty 11,000-horsepower towboat at C&C Marine and Repair in Belle Chasse, La.; a clean-burning EPA Tier 4 retractable towboat at Steiner Construction Company in Bayou La Batre, Ala.; and Hydrogen One, a first-of-its-kind towboat that will run on emissions-reducing methanol-to-hydrogen generator technology, being built at Intracoastal Iron Works in Bourg, La.

"The barging industry is already the greenest form of transportation. There's no doubt. It's not even close," Ellis said, but noted that the industry is always looking at the way it operates and the technology it uses as it continually strives to be even more environmentally friendly. "Our most immediate focus is on how we operate. When we're running low water and the channels aren't properly dredged and marked, or locks and dams aren't operationally sound, the whole industry becomes more inefficient. We're burning way too much carbon per ton mile."

"What we've done is create additional efficiencies by being able to safely turn off certain main power when we're not needing it. That's something that's fairly new to what we do, and we've saved a tremendous amount of not only fuel, but also carbon emissions."

The next step, Ellis said, involves exploring new technologies. "The Tier 4 engines are a prime example of our industry moving to a cleaner form of combustible propulsion, and there's also the future of other forms of non-combustion type propulsion, which you see with the Hydrogen One vessel that we will operate."

"From an operation standpoint, there will be a lot that we are able to learn [from Hydrogen One] about the technology and how sustainable and applicable it can be to different types of cargo movements," Ellis said. "We are looking forward to operating the equipment to test its boundaries."

Ellis said other alternative fuel options are on ACBL's radar, but that its investment in these technologies in the near future is unlikely. "We're investing time, but we're not investing hard dollars [at this point]," he said. "We're probably paying closer attention to certain applications for battery-operated vessels within short haul ports, and how to interchange battery packs to make downtime less of an issue and less of an obstacle. We have to develop ways to keep the downtime on these battery-operated vessels to a minimum."

Of course, the cutting edge of technology typically brings higher price tags. Pure battery-powered vessels, for example, may make sense in certain scenarios, but are often not commercially viable without support from some type of grant

program or government funding, Ellis said. "Our industry will not be able to see any real meaningful [technological] changes until they become more economically feasible."

"So, until the cost versus benefit for the operators like us who have to make investments balances, we probably won't see the industry move as fast as customers probably want us to, or our government would want us to, Ellis said. "The cost of the technology is still much higher than anyone is willing to pay for it."

The power of AI

As it strives to maximize efficiency, ACBL is making use of advanced technology such as computer modeling and artificial intelligence (AI) to best map out how it operates. "There are parts of our business that are very complicated, when we're moving 4,000-plus barges on our network," Ellis said. "How we move those barges, how we build those tows, how we run our intervals are super important to us."

Last year, ACBL kicked off a program called MOST (Marine Operating System Transformation), which combines a number of software products the company uses to improve operational efficiency as well as the experience and interface for its customers.

"We are investing in some really interesting technology to help us more efficiently run our business, and to be able to turn our barges faster, to be able to provide a better customer experience from beginning to end on where your barges are, what the status is," Ellis said. "That technology is a huge piece of what we do, and we're very excited about it."

Column

Autonomous Vessels

Recognizing and Meeting the Challenges of Autonomous Vessels

By Grady S. Hurley, Jones Walker LLP

Uncrewed surface vessels (USVs), automated vessels, maritime autonomous surface ships (MASS), remote controlled vessels, and the employment of artificial intelligence and smart marine technology to navigate and operate civilian and military vessels have created a lively debate over utilizing and regulating such technology. Recent articles addressing artificial intelligence (AI) have questioned the value of experience and intuition versus computed logic based upon data and logarithmic differentiations. What would have happened to flight

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1549 if Captain Sully had not used his experience and the plane had been guided purely by AI?

In the 1950s, the authors Isaac Asimov and Ray Bradbury pondered AI. Bradbury, in The Martian Chronicles, described a planet where daily life continued without humans in an AI world. Asimov, in iRobot, confronted the problems and challenges of creating robots to perform dangerous tasks while safely interacting with humans. What, then, are the role and future of USV and MASS? Technology is not new in assisting humans. Artificial intelligence in completely supplanting human judgment is new. However, we are not there, yet.

What is an "autonomous vessel"? 1 U.S.C. 3 describes vessels as "anything that floats." Autonomous can mean "on its own" or "semi-autonomous" with assistance. This includes everything from drones to vessels with autopilot and critical warning systems. We are an automated society seeking to fully automate vessels, while maintaining ultimate control and determining how to regulate fully automated and/or remote-controlled vessels. Regulatory change and guidelines are being discussed.

Military applications are here

Autonomous vessels are in use by various militaries. On May 25, 2023, the Israeli Aerospace Industries launched The Blue Whale, an autonomous underwater vehicle (AUV). It will be used for naval intelligence and to identify the presence of mines at sea.

Australia has recently announced

Column
Autonomous Vessels

that it has budgeted $700 million in high-tech naval sea mines and other smart weapons at sea.

For years, the U.S. Navy has been testing drone vessels under its drone boat evaluation program, Ghost Fleet Overlord. The U.S. Navy is focusing on autonomous vessels for use above and below the surface. In February 2023, the USNS. Apalachicola was delivered measuring 337 feet in length with autonomous capabilities to transport troops and to serve as a platform for Osprey aircraft. It can operate autonomously for up to 30 days at sea.

All naval nations have and/or are developing drones and automated vessels. How will the development of AUV and military MASS affect the traditional rules of engagement? On the military side, there is little public discussion. On the commercial side of the development of USV and MASS, the scoping process is well underway.

Commercial use in development

Commercially, automated vessels, fully automated vessels, and remote-controlled vessels are in development. Yahoo Finance reported that in 2022 there was an investment of $3.9 billion in the autonomous ship business. The projected investment by 2030 is $8.2 billion. The emergence of USV and MASS challenges the concepts of marine insurance, limitation of liability statutes, and the Rules of the Road. In March 2023, the USCG released its Unmanned Systems Strategic Plan (USSP) to implement a risk-based approach to develop manning expertise and to collaborate internationally to apply lessons learned. A Maritime Workforce Guidebook was recently introduced during the 2023 Singapore Maritime Week to recognize maritime job redesign to account for the changing needs of automated and remote-controlled vessels.

The International Maritime Organization (IMO) has developed a multinational working group to address safety, legal, and port issues affecting MASS. The IMO has already engaged in scoping exercises to consider how COLREGs may be adapted to MASS. In April, the Joint Working Group met in London. They considered the continuing need for a human Master either onboard or at a remote operations center (ROC). Among continuing discussion is how to license and certify an ROC as Master. Their next

A U.S. Navy L3Harris Arabian Fox MAST-13 uncrewed surface vessel sails during an exercise in the Arabian Gulf in January 2023.

Anita Chebahtah / U.S. Navy

meeting is in September, and will include a discussion of port operations.

Every nation is racing toward the world of autonomous shipping. Autonomous shipping is no longer a fictional topic, but a reality. As with any change in technology, the goals are safety and efficiency. The challenge is adapting existing maritime principles where relevant and mutually recognizing and agreeing on new laws and regulations.

As a maritime society, we have progressed from sails to engines, from sextants to satellites, and from parallel rulers to GPS networks setting courses. As technology has advanced, the maritime industry has collaborated and met the challenges of a continuously evolving technological world. The future is here and more is yet to come.

All images: Ocean Infinity

The Journey to Remote Vessel Operation

Conducting maritime and subsea operations lean-crewed or entirely remotely, is a problem with many moving parts. We meet one company helping to lead the way in this rapidly emerging field.

Ocean Infinity is a young company with a huge vision; that the way we use robotics at sea can now be taken several massive steps further on. The business' activities stand a good chance of changing the way in which seabed and maritime activities are conducted, all over the world, forever.

Learning curve

Ocean Infinity marine robotics expert Dan Hook is under no illusion that this is going to be an easy path: "Our customers must reduce the personnel requirements of offshore operations for multiple reasons. Fewer humans aboard means that operations can be conducted with much smaller ships. Every extra body aboard requires a surprisingly large amount of extra space in the shape of galleys, toilets, food and waste storage, and not forgetting all the extra fuel to shunt all that about. We are building partially remotely operated 78-meter ships at Ocean Infinity that will be run by a crew of just 16, while performing tasks that would otherwise be performed by a crew of

"We are building partially remotely operated 78-meter ships at Ocean Infinity that will be run by a crew of just 16, while performing tasks that would otherwise be performed by a crew of 50."

– Dan Hook,
Ocean Infinity

50. Smaller, and in our case much cleaner running ships contribute a big co2 saving, and many of our customers have demanding industry or self-imposed decarbonization roadmaps to stick to.

"For other customers, operational efficiency is high on the agenda; operating vessels remotely will, in the long run, allow the efficiency of highly skilled and well-paid personnel, such as ROV pilots, to work across multiple ships and not be stuck on one vessel on one job. If there is, for example, a technical breakdown with an ROV offshore, a skilled pilot on a fully manned 'traditional' operation might be left twiddling their thumbs for hours or days, but with remote operation in minutes they can immediately be piloting another ROV from a different ship, even in a different ocean.

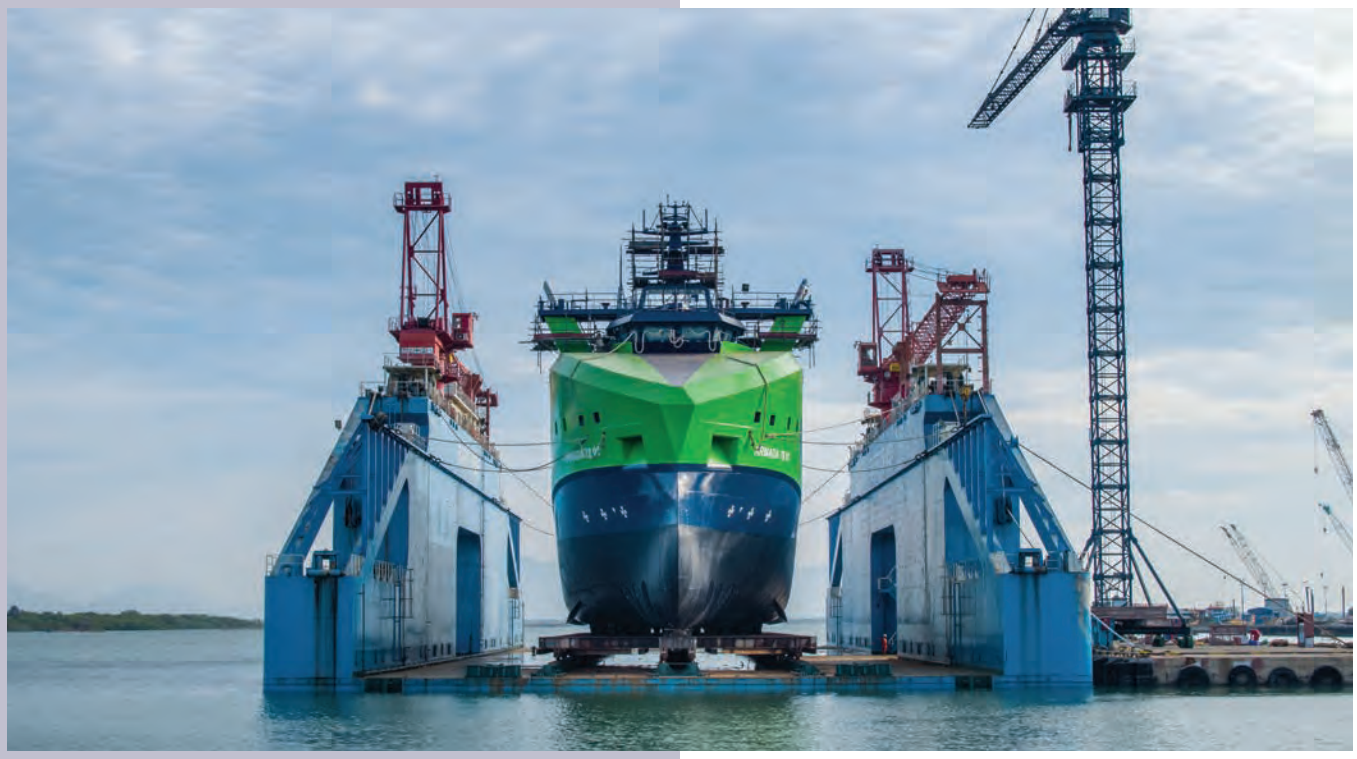
"There are countless other benefits too, from enabling a better work/life balance for staff by allowing them to perform offshore tasks onshore, to improved safety and faster deployment capabilities. The truth of it is our customers work with us because we can offer a combination of all of the above, and often other aspects we'd not even thought of ourselves, reflecting the steep learning curve we, and this new industry, are on."

One common concern in the wider economy around automation is its potential to hurt job numbers and opportunities within the industry. In the short run at least, this is blatantly incorrect, Ocean Infinity argues. The strong regulatory frameworks that are being built up around remote vessel operations mean that some roles are initially having to be doubled up. What is definitely changing is how and where people will work. Sure, the number of people working offshore who physically go offshore will be reduced, but these are often antisocial jobs, unconducive to family life, so many will not mourn their passing, the company believes.

Remote vessel operations also have the potential to change the currently poor levels of diversity in maritime for the better. The traditional, physical and psychological demands of these jobs change considerably when they are brought ashore. Where in the past, ageing, physically challenged or those wishing to start families or care for relatives would have had to hang up their sea boots for good, now they have more options.

Pods

If there's a single room at Ocean Infinity where most of this magical transformation will be made flesh, it's the Remote Control Center (RCC). With the air of a Bond villain's lair, this huge dark space, nestled in the bowels of the operation, is where the various maritime experts will control the to-ings and fro-ings of diverse operations from cable route surveys to seabed cone penetration testing.



Armada 78 first pictures on water

Around the periphery of the room, individual control pods 'Bridges', each equipped with a (proper marine specification) helmsman's seat and designed to deliver peerless situational awareness will be home to up to 20 operators at any one time. More managerial staff such as vessel captains, will work on more conventional office type workstations inboard and on a raised dais from where multiple activities and vessels can be overseen. The ethos of close collaboration and duty of care has clearly been built into all design aspects. This is right down to the little padded perches for observers of activities within the pods to sit, slightly aft and abeam of the operator, so as to be able to watch proceedings without creating any distraction or undue pressure.

For our visit in January 2023, the RCC was a fully equipped shell, entirely devoid of people but things are moving quickly. A full 'dress rehearsal' will happen in February and fully remote controlled and monitored lean-crewed vessel operations will start in May. As Ocean Infinity's head of marine remote systems, Colin Field pointed out, it's going to be quite a contrast: "We'll conduct operations here 24/7/365. So, from how we see it now, it will be a busy hub working constantly around the clock."

Creating something new

Part of the challenge, and excitement for Field is playing such a key role in creating something so new to the industry, and not just in terms of the technology. At the time of writing, Field admitted there was even still some conjecture at Ocean Infin-

ity, around what it will actually feel like to work in this RCC and who would actually be best to employ: "While we obviously need people with certain competencies and in many cases seagoing qualifications to meet our legal obligations, nobody has built anything like this before, so it's not like we can take a look at what everyone else is doing.

"Do we employ young gamers with peerless ability to evaluate multiple streams of information coming from multiple screens at the same time? Or do we go for huge sea-time and experience as our first requisite? Industries such as air traffic control recruit to a very tight set of parameters and consequently have a very high rejection rate; but they have been recruiting for long enough to have a very clear idea of who they want and require a narrower set of skills. Common sense dictates that we'll start with a mix of all sorts of skill sets and backgrounds, and operating worldwide as we will from the start, diversity in all aspects from gender, to age to ethnicity will matter more to us than most other employers."

The discussions still taking place about staffing, just a few months before 'go live' tell a larger story; one about the costs of being the first in not just new technologies, but in many respects building a whole new industry. As Hook continued, "Being first to a market like this is a fairly high risk, but potentially high reward strategy. Consider just one aspect: the cost of lobbying and liaising with lawmakers in individual maritime territories. Often, even still, when we want to perform a remote-controlled vessel operation, the relevant maritime authority has no framework in place with which to advise us or give the go-ahead. Sometimes, regrettably it's just easier for them to say 'no'. We have a team here whose main remit is to monitor developments, take part in the highest-level discussions and generally, wherever possible 'be in the room' when discussions around maritime remote control, robotics and autonomy are taking place. The second company to follow us into this space will be knocking on considerably fewer closed doors but they won't have our first to market status."

Build program

The company worked out recently that it had over a kilometer's worth of vessels at its disposal, working in a diverse range of industries from oil and gas to marine renewables, defense and interconnectors. At the moment, the company is already conducting fully manned activities including survey and deepwater search, often deploying a fleet of Kongsberg Hugin vehicles from chartered vessels, that will be replaced in the next year by the newbuilding Ocean Infinity Armada fleet. Of these 78-meter lean crewed vessels, built by VARD in Vietnam, two have been

delivered and the remaining six are due to arrive this year.

Following closely on their heels will be a fleet of six 86-meter ships due to commence build in 2024, again at VARD, with delivery for the first ships due early 2025. According to Ocean Infinity, all the vessels it is commissioning are future-proofed, not merely in terms of operational tweaks but also fuel type. Most will launch as diesel electric hybrids, but all will have large empty spaces aboard for future fuel provision, whether that future fuel be methanol, ammonia, straight hydrogen or a range of these.

In terms of the largest entirely uncrewed vessels on the fleet, five 36-meter boats (currently in build) will be as big as the company would like to talk about going at the moment.

Having seen the level at which Ocean Infinity is working, it will take quite a competitor company to operate in this space, and those "who would like the security of waiting for a harmonized worldwide regulatory framework to exist will wait a decade or more before they can even get started," speculates Field.

Certain competitors are overlapping bits of Ocean Infinity's areas of expertise by launching USVs from unmanned small craft or operating vessels such as ferries from remote control centers. However, in terms of the swathe of capabilities that Ocean Infinity can offer; surface to subsea, 8- to 86-meter surface craft, subsea inspection and intervention, uncrewed and lean crewed, the closest competitor according to Hook would be "the U.S. Navy, but they've not got much interest in offshore renewables!"

U.S. Navy Sailors aboard the amphibious dock landing ship USS Ashland (LSD-48), moor a landing craft, utility during amphibious operations, off the coast of Okinawa, Japan, in March 2023.

Christopher R. Lape / U.S. Marine Corps

America's Sea Services Building Large Fleet of Small Ships and Craft

By Edward Lundquist

Not every vessel in the U.S. Navy is built for major combat operations on the high seas. There are large numbers of boats and service craft that provide essential services to the sea services, the nation and its partners.

The U.S. Navy procures about 100 small boats per year. Some of these boats are based on commercial designs, procured to a Navy developed specification that tailors the requirements to the end user needs. They are procured and managed by two Naval Sea Systems Command program offices—PMS 300 and PMS 325.

While not flashy, service craft play a vital role for the Navy.

Tiara N. Robinson, a public affairs specialist with Naval Sea Systems Command in Washington, said NAVSEA has active contracts for two types of berthing and messing barges. "The larger of the two is the Auxiliary Personnel Lighter (APL) which is being built by Bollinger Mississippi Shipbuilding (formerly VT Halter) in Mississippi. The smaller of the two is the Yard Repair Berthing and Messing (YRBM) barge which is being built by Conrad Shipyard LLC in Louisiana. These berthing and messing barges are bringing significant quality of life improvements for sailors as they augment and replace older barges."

Robinson said that NAVSEA has a contract with Austal USA in Alabama to build an Auxiliary Floating Drydock Medium (AFDM) that will be used on west coast surface ship maintenance availabilities. In April 2023, NAVSEA awarded a fuel oil barge (YON) contract to Sterling Shipyard in Port Neches, Texas, that will provide for up to six barges that provide fuel storage and supply

at designated Naval Bases.

The Navy is working with the National Oceanic and Atmospheric Administration (NOAA) to acquire two new research ships for NOAA's ocean exploration and scientific research missions. The 244-foot ships, which will be named Oceanographer and Discoverer, are being built by Thoma-Sea Marine Constructors LLC in Houma, La.

Compared to warships and auxiliaries, the boats are small, but are made by a large number of boat builders across the country. For 2023, the most active contracts include:

- 40 Foot Patrol Boat (built by Metal Shark in Louisiana)
- Harbor Security Boats (built by Metal Shark in Louisiana)
- 11 Meter Naval Special Warfare (NSW) Surface Support Craft (SSC) (built by Silver Ships in Alabama)
- Oil Spill Response (OSR) Utility Boat (UB) (built by Metal Craft Marine in New York)
- Force Protection Small and Large (built by Metal Craft Marine in New York)
- 11 Meter USMC Assault Amphibian Safety Boats (AASB's) (built by Silver Ships in Alabama)
- 11 Meter Expeditionary RIB (built by RIBCRAFT in Massachusetts)
- Workboat Large (built by Snow in Washington)
- 7 Meter and 11 Meter Shipboard Rigid Inflatable Boats (RIBS) (built by RIBCRAFT in Massachusetts)
- Force Protection Medium (FPM) (built by Lake Assault Boats in Wisconsin)

Expeditionary craft

Getting material, personnel and vehicles from expeditionary sea basing ships and the shore is a job for ship-to-shore landing craft. Currently that mission is conducted primarily with "landing craft, utility" (LCUs) and landing craft air cushion (LCAC) vessels. Both classes are old, and there are replacement programs underway.

According to Robinson, the Ship to Shore Connector (SSC) is a one-for-one replacement for the legacy LCACs. The prime contractor for SSC is Textron Systems of Slidell, La. The program of record is 73 craft, one of which is a test and training craft and the other 72 are fleet assets. Currently, seven craft have been delivered (one test and training craft and six fleet assets), with 12 more in production.

The SSC program represents the first major naval acquisition program in more than 15 years to be designed "in-house" by the Navy rather than by industry partners.

"The Navy took advantage of its air cushion vehicle expertise to produce a contract-level design for SSC, which was then completed by the shipbuilder," she said. "The 'in house' design enabled the Navy to capture lessons learned from the existing LCACs and expanded the potential pool of bidders to ensure full and open competition."

Called the LCAC 100 Class, the SSC will perform similar missions, and has similar dimensions and clearances to the LCAC, which ensures the compatibility of SSC with existing well deck equipped amphibious ships, while being designed to provide more lift, lower fuel consumption and less maintenance.

While awaiting the SSCs, the Navy conducted a service life extension program (SLEP) for the legacy LCACs. "The program involves upgrading the powertrain to provide additional power as well as decreasing fuel consumption and maintenance needs," Robinson said. "The SLEP also replaced older technologies, including upgrading command, control, communications, computer and navigation, or C4N, systems. LCAC SLEP extends the craft beyond their original 20-year service life."

While all in-service LCACs are now in the SLEP configuration, and the program is complete, a new program, the LCAC Extended Service Live Extension Program (E-SLEP) is underway at Walashek Industrial & Marine, Inc., of Norfolk, Va., with work being performed at Camp Pendleton. "The first E-SLEP craft was delivered, over a month ahead of schedule, in February 2023," Robinson said. "There are currently three E-SLEP availabilities ongoing and a contract for two more was recently awarded."

The Navy is also replacing it LCU 1650 class landing craft, utility (LCU) with the new LCU 1700 class vessels. As of last August, 32 LCUs 1700 are being built at Swift Ships of Morgan City, La. The LCU 1700 can carry two MIAI main battle tanks or 350 troops and have a 1,200 nautical mile range at 8 knots.

A new Light Amphibious Warship (LAW) is being designed to augment the Navy's larger, multipurpose amphibious warships. LAWS will be known as the "landing ship, medium," or LSM. Five industry partners are contracted to provide concept studies, with a follow-on option for preliminary design.

"The Navy and Marine Corps have finalized requirements for the Medium Landing Ship (LSM), formerly

Moises Sandoval / U.S. Navy

A landing craft, air cushion (LCAC) deploys from the amphibious dock landing ship USS Carter Hall (LSD 50) in the Atlantic Ocean.

Artist's conception of the Swift Ships LCU 1700

Swift Ships

known as LAW, and are in the process of final requirements approval of the Capabilities Development Document (CDD). The Concept Studies and Preliminary Design occurred from 2021 through 2022 and are being used to inform the requirements and ship specification," Robinson said. "The Navy intends to award a contract for the lead ship in 2025."

The Navy's floating drydock fleet is getting smaller and older. In June of last year, the Navy awarded Austal USA a $128 million detailed design and construction (DD&C) contract for a news auxiliary floating dry dock medium (AFDM) for the Navy. To replace the Navy's oceangoing towing and salvage platforms operated by Military Sealift Command, Austal USA is also building four Navajo-class Towing, Salvage, and Rescue Ships (T-ATS 11 - 14).

Coast Guard's big fleet of small boats

The U.S. Coast Guard accepted delivery of the first fifth-generation Over the Horizon (OTH V) cutter boat on April 18, which will support fast response cutter. This

first boat will serve as an operational test and evaluation platform, but will be assigned to USCGC Angela McShan (WPC 1135), based in Cape May, N.J., in an operational role. The 10-year OTH V contract was awarded to Inventech Marine Solutions of Bremerton, Wash., in August 2022. The contract supports delivery of up to 194 boats and has a total value of almost $100 million.

The OTH V will be deployed across the Coast Guard fleet of national security cutters, fast response cutters, offshore patrol cutters, polar security cutters and legacy medium endurance cutters, and extends the parent cutter's capabilities and has the speed, endurance, communications and sensors to conduct missions far from the parent ship.

The Coast Guard acquired 174 RB-M 45-foot Response Boat-Mediums (RB-Ms), with the final boat was produced and delivered in 2015. The RB-M has proven effective search and rescue; ports, waterways and coastal security; law enforcement; and drug and migrant interdiction missions. The RB-Ms were built at Marinette Marine Corp. of Marinette, Wis.

The Response Boat-Small II (RB-S II) program delivered 370 of the 29-foot boats to the Coast Guard, with the final boat delivered by Metal Shark Aluminum Boats of Jeanerette, La., in 2019. The 40-knot RB-s IIs are high-speed and deployable, and designed for port and waterway security, search and rescue, drug and migrant interdiction, environmental and other law enforcement missions. The Coast Guard acquired 370 RB-S IIs at an approximate total contract value of $150 million, making it one of the largest boat buys of its type for the service.

The Coast Guard is in the process of updating its 470-foot motor lifeboats as part of a service life extension program (47' MLB SLEP) at Birdon facilities in Washington and Connecticut. According to Coast Guard spokesman Richard Kanehl, the contract will upgrade at least 107 boats, and the project has total projected contract value of about $190 million to complete the SLEP over the 10-year contract period.

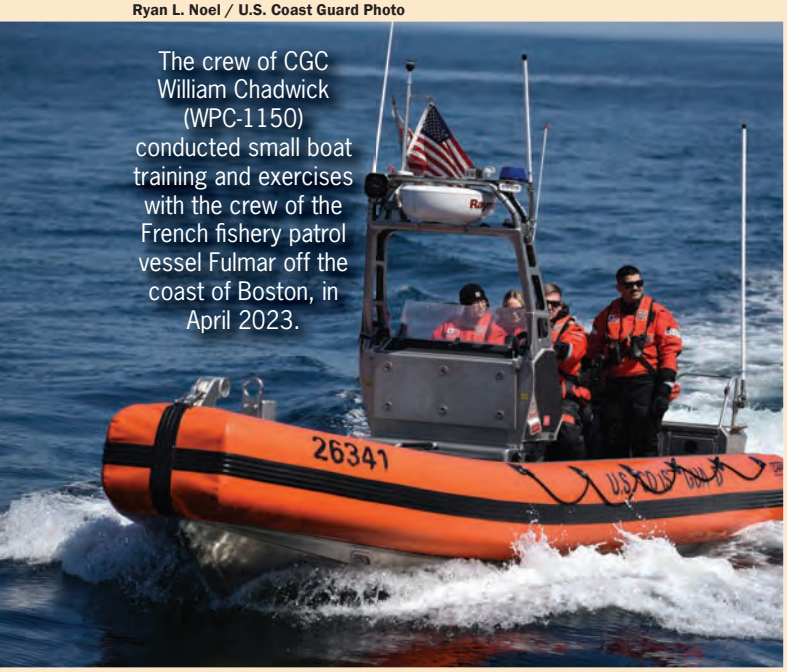
The Coast Guard is also in the process of replacing its aged fleet of 35 inland waterway tenders that support the aids to navigation (ATON) mission. The Waterways Commerce Cutter program is being managed with a joint program office with the Coast Guard Acquisition Directorate and NAVSEA. Denver, Colo.-based Birdon America, Inc., was awarded a contract for the detail design and construction of the river buoy and inland construction tenders. The contract in-

A USCG 47-foot Motor Lifeboat

U.S. Coast Guard

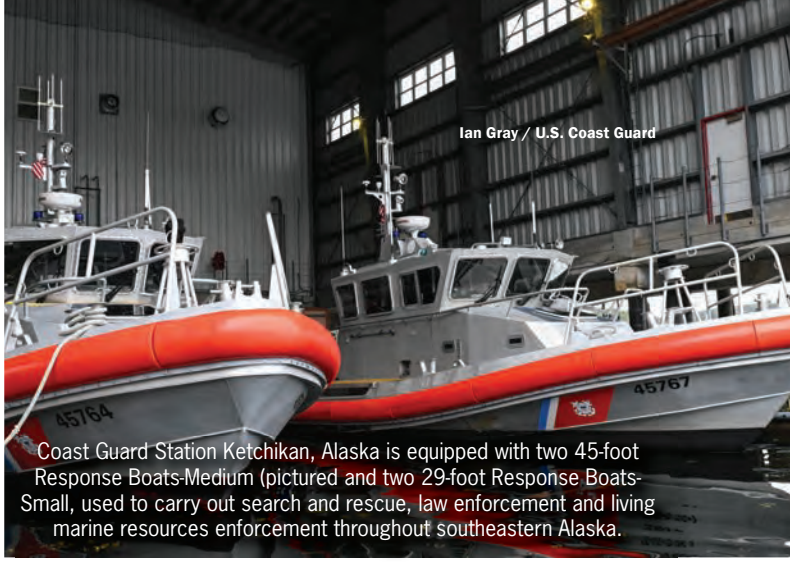
Feature
Gov't Shipbuilding

Ryan L. Noel / U.S. Coast Guard Photo



The crew of CGC William Chadwick (WPC-1150) conducted small boat training and exercises with the crew of the French fishery patrol vessel Fulmar off the coast of Boston, in April 2023.

Ian Gray / U.S. Coast Guard



Coast Guard Station Ketchikan, Alaska is equipped with two 45-foot Response Boats-Medium (pictured and two 29-foot Response Boats-Small, used to carry out search and rescue, law enforcement and living marine resources enforcement throughout southeastern Alaska.

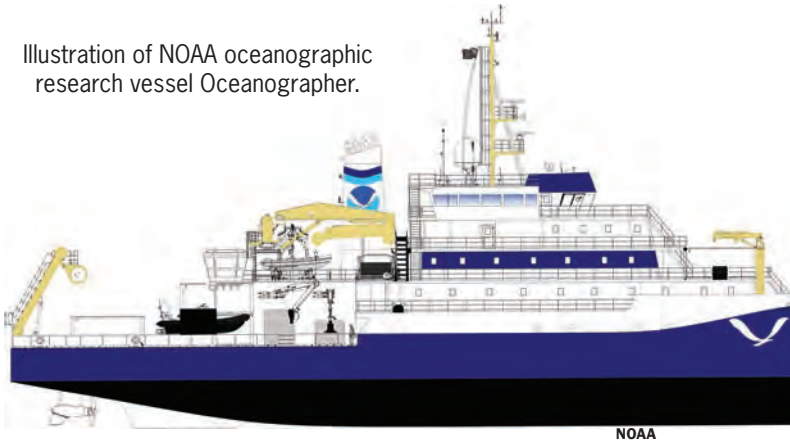


Illustration of NOAA oceanographic research vessel Oceanographer.

NOAA

The Honduran Naval Force's new patrol boat, Río Aguán (FNH-8502), was commissioned in July 2021.

Secretaria de Defensa Nacional, Honduras, courtesy U.S. Southern Command

cludes options for the construction of a total of 16 river buoy tenders and 11 inland construction tenders. A third ship in the program, the Inland Buoy Tender, is being acquired separately. The Coast Guard is partnering with the U.S. Army Corps of Engineers Marine Design Center to develop a government-led design for the Inland Buoy Tender variant.

Foreign military sales

A significant number of boats are acquired for and transferred to allied and partner nations, particularly smaller navies and coast guard. According to Robinson, NAVSEA has over 100 active foreign military sales (FMS) cases that are delivering small boats and combatant craft to international customers.

According to Robinson some of the prominent FMS cases include the Near Coastal Patrol Vessel (NCPV) being provided to partner nations in South America. The NCPV program is a partnership with the U.S. Department of State and U.S. Southern Command (USSOUTHCOM) to support patrol operations in U.S.-allied countries in Central America, Latin America and the Caribbean. Metal Shark was is building the NCPVs for Costa Rica, the Dominican Republic, El Salvador, Guatemala and Honduras.

Rigid hull Inflatable Boats (RIBs) and patrol boats are also being provided to partner nations across the middle east, South America and Europe.

"The Navy also has smaller FMS cases that provide small boat equipment, training and life cycle support," Robinson said.

USACE

DREDGING: KEEPING THE MISSISSIPPI OPEN

By Tom Ewing

"Not only does the top of the river move, but the bottom of the river also moves." - James Bodron, U.S. Army Corps of Engineers, Mississippi Valley Division, Regional Business Director.

Dredging was the Herculean act that allowed much of the U.S. economy to keep chugging along as usual, at least for Midwest and Central states, as drought conditions threatened to shut down river traffic on the Mississippi River and its tributaries, during fall and winter 2022 and early 2023.

The full scope of these U.S. Army Corps of Engineers' (USACE) dredging efforts was highlighted at the December 1, 2022, meeting of the Inland Waterways Users Board, in Galveston, Texas.

James Bodron, with the Crops' Mississippi Valley Division, summarized the USACE's expansive work. "We have a plan to keep the river open," Bodron explained in December.

The Mississippi Valley Division (MVD) includes six USACE Districts: St. Paul, Minn.; Rock Island, Ill.; St.

Louis, Mo.; Memphis, Tenn.; Vicksburg, Miss.; and New Orleans, La.

Eight dredges were central for maintaining a 9-foot channel, focused on the Mississippi, between St. Louis and Cairo, Ill. The Corps was looking to add three more dredges, two for harbors in Memphis and Vicksburg and one for the Red and Ouachita Rivers.

In December, the Mississippi's lowest stage was minus 10 feet. For perspective, Bodron noted similar low-flow conditions in 2012 but fewer river traffic problems in 2022. Bodron cited NOAA data that 2022 was the 15th driest year nationally.

Bodron said dustpan dredges work best on the lower Mississippi, where four were at work. He referred to dustpans as "big vacuum cleaners". Cutterhead dredges are primarily used for harbors, he said. Demands on crews and equipment were extensive. The dustpans, in December, had already worked almost 100 days. Normal dispatch is about 45 days each year. "So, we've got twice the dredging we've already had in the lower river," Bodron reported, "And we expected that could be up to 200 days of dredging if the low water continues."

These intense efforts did not go unnoticed by the Users Board. Chairman W. Spencer Murphy, with Canal Barge Company, complimented and thanked the Corps: "The Corps has done a tremendous job keeping navigation channels open and finding creative ways to fund non-stop dredging operations. We never lost our ability to operate on the rivers despite record low water conditions. It's a credit to the Corps' proactive work to identify dredging needs and mobilize into action. For this great work, we thank the Corps, including many leaders in this room, for your help in ensuring that our inland system remains a reliable mode for moving the nation's critical freight."

Lisa Parker, with the MVD press office, was asked about lessons learned from the 2022 drought. She said that communication between industry and the Corps was important in order to know about shoaling problems and dredging priorities. She said social media will be used more extensively in the future.

Another lesson: equipment maintenance. Two USACE dredges – the Jadwin and Potter – are over 90 years old. Parker said maintenance was scheduled regionally to ensure that only one dredge was down at a time. This worked; MVD had no major breakdowns.

OTHER PROJECTS AND ISSUES

The Corps spends around $1.5 billion each year on dredging in hundreds of navigation projects across the country. The Corps is responsible for maintaining and improving nearly 12,000 miles of shallow-draft inland and intracoastal waterways, 13,000 miles of deep-draft coastal channels and 400 ports, harbors and turning basins throughout the U.S.

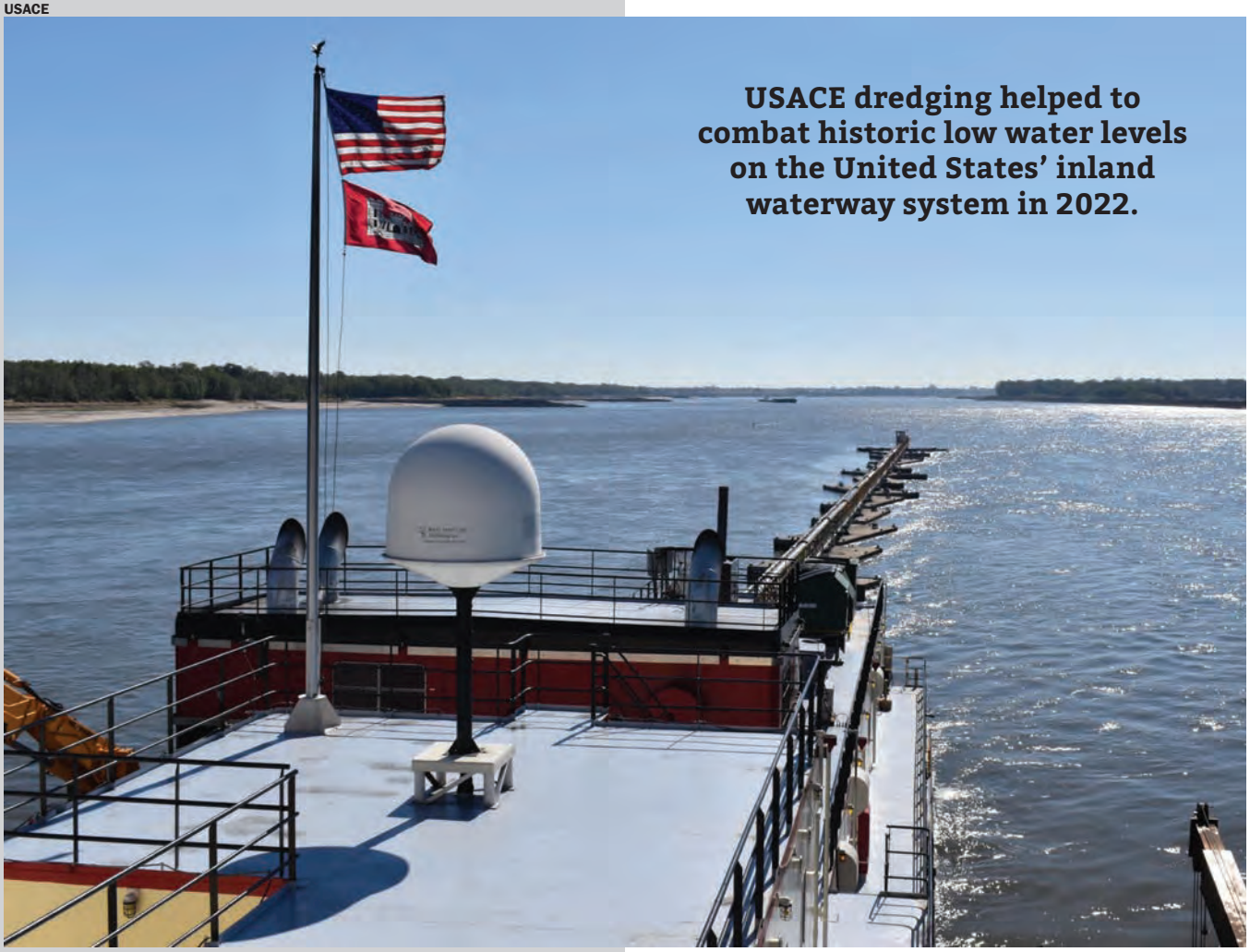
Top issues each year, across the industry, are presented at the USACE's annual National Dredging Meeting, scheduled this year for May 24 in Atlanta. The meeting includes dredging leadership from government and industry, and it precedes a next-day (May 25) meeting of the Industry/Corps Hopper Dredge Management Group, a forum for representatives from hopper dredge companies and the Corps.

Kate Skelton, USACE's Coastal Navigation Program Manager, said top issues in 2023 are safety, beneficial use of dredged material, modernizing and strengthening national waterways and "strengthening communications and relationships with our partners". The meetings provide a chance to meet with USACE District leadership as well as Corps personnel from various offices, such as ERDC – USACE's Engineer Research and Development Center – and contracting and cost estimating.

Beneficial use (BU) is a focus among USACE regions and across federal agencies. On the West Coast, for example, in USEPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and 148 Tribal Nations) EPA and USACE work together on BU. Michael Brogan, with the Region 9 press office, said "(EPA's) top focus continues to be beneficial reuse of material from navigational dredging, as opposed to wasting that material in the ocean. Beneficial reuse advances climate resiliency and is a nature-based solution as called for by the Administration." Brogan said EPA's aim is to "significantly increase" BU; now, just 40% of dredged material is reused in Region 9.

Money and timing are factors with BU. Hauling costs can go way up and the overall BU schedule may not align with when dredging can be done. Brogan said EPA is working with coastal states to set policies and permitting frameworks to "encourage the removal of barriers to dredged material reuse." He added that "multiple regulatory and resource agencies operate in our region's dredging realm, particularly in California, so close coordination on all elements is critical to make reuse happen." Regarding environmental

USACE



USACE dredging helped to combat historic low water levels on the United States' inland waterway system in 2022.

issues Brogan noted that "contaminants in sediments are generally not as prevalent in our region, as opposed to older industrialized harbors and areas in the East."

Dave Deegan is with EPA's public affairs office in New England. He too said that "although there has always been an interest in finding beneficial uses for dredged material, there is a renewed focus on this topic in 2023 at both the regional and national levels." BU challenges arise when there are concurrent multiple, large-volume dredge projects, not just with siting but with limited shoreside handling facilities. In addition, Deegan said, dredging in older port areas raises contamination concerns.

In MVD, Parker said the Division is partnering with USACE's Engineer Research & Development Center on BU research, seeking ways to "maximize the value of the dredging program and to better understand and predict sedimentation patterns at Southwest Pass."

Another research focus is on innovative contracting methods such as the Regional Dredge Demonstration Project that allows early award contracts for hopper dredges in Southwest Pass and combining contracts that have similar dredging needs into a single contract. Parker said "this allows for fewer 'no bid busts', a reduced cost per cubic yard, and a more efficient process of awarding contracts" (see sidebar on AI and contracting).

SOME PRIVATE SECTOR INSIGHTS

Great Lakes Dock and Dredge (GLDD) is the largest

AAPA

"Developing a comprehensive strategy for coastal navigation funding is a no-brainer."

– Jen Armstrong, Director of Navigation Policy and Legislation, AAPA

provider of dredging services in the U.S. In May, GLDD reported its 2023 first quarter financial results. GLDD's public filing provides insights into the industry's challenges.

While most of its vessels were working, the total mix of projects for GLDD was less profitable than in the first quarter of 2022. Weather delayed projects in the Northeast.

GLDD's total first quarter 2023 bid market is over $300 million, about $125 million higher than a year earlier. Port deepening and widening projects, delayed in 2022, are now restarting.

Big projects are on the horizon, e.g., the $160 million Freeport Capital Port Deepening project. GLDD is keeping an eye on liquified natural gas projects that will require dredging likely in the second half of 2023. GLDD notes

USACE

The USACE Memphis District's dredge Hurley in January wrapped up a record-breaking 273-day dredging season.

that several North American liquefied natural gas (LNG) export projects were delayed during the pandemic. However, the company comments that "with the increase in LNG prices, some of these LNG projects are currently gaining momentum and are targeting final investment decisions in 2023."

GLDD adds further that "we expect that improved market conditions, combined with the fleet adjustment and cost reduction initiatives, will provide improved results in 2023 and beyond."

GLDD references that a number of public policy developments are important for the dredging industry. For example, GLDD is active in offshore wind work. The company is constructing the Acadia, a fallpipe vessel for subsea rock installation, expected to be delivered in the first half of 2025. In 2022, GLDD was awarded rock installation contracts for the Empire Wind I and II projects by Equinor and BP, with installation windows in 2025 and 2026. The company is bidding additional offshore wind farm projects with rock installations planned for 2025 and beyond.

In a market update section, GLDD notes continued strong support for dredging from the Biden Administration and Congress. The company highlights funding from the following:

- *The Omnibus Appropriations Bill for fiscal year 2023 which includes a record $8.66 billion budget for the Army Corps of Engineers' civil works program;*
- *Of that, $2.32 billion is provided for the Harbor Maintenance Trust Fund; and,*
- *The Disaster Relief Supplemental Appropriations Act for fiscal year 2023 includes $1.48 billion for the Corps to make necessary repairs to infrastructure impacted by hurricanes and other natural disasters and to initiate beach renourishment projects that will increase coastal resiliency.*

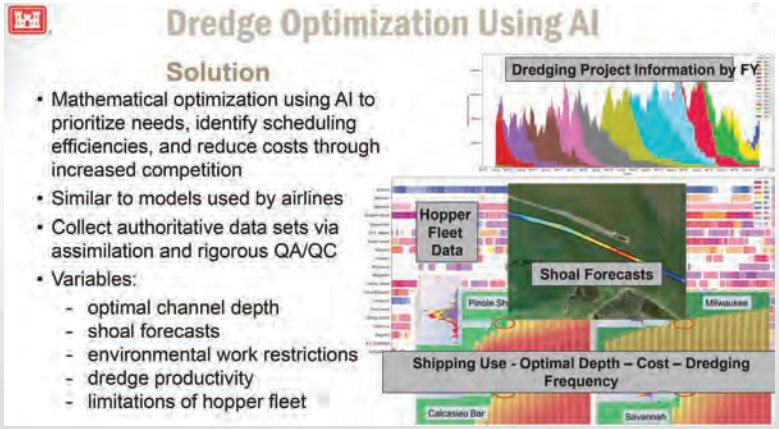
GLDD concludes that "This increased budget and additional funding support our expectation for a stronger bid market in 2023."

The American Association of Port Authorities (AAPA) is a trade organization that works to keep its members timely and connected with USACE's dredging policies and coastal navigation mission. Jen Armstrong is AAPA's Director of Navigation Policy and Legislation. In a recent article for AAPA's Seaports newsletter, Armstrong suggested ways that could improve federal budget processes that impact large engineering projects, such as USACE's projects that can be negatively impacted because they depend on annual appropriations and on a project-by-project basis.

Armstrong suggests the need to develop a national coastal navigation strategy.

"The volume of ongoing studies and projects in the design phase is a bellwether for forecasting future construction needs," Armstrong writes. She suggests that to prepare for the next project wave, industry and government leadership should work now to tackle funding and budgeting problems head-on. It's important to keep in mind that projects often involve a number of major partners, all of whom need to contribute to the total cost and within coordinated schedules. Armstrong writes that, indeed, a comprehensive strategic plan that identifies and optimizes cost savings would complement requirements in the National Defense Authorization Act which directs that the national maritime strategy is updated every five years. "Developing a comprehensive strategy for coastal navigation funding is a no-brainer," Armstrong concludes.

Using AI to Improve Dredging Operations



Dredging is the largest individual item in the USACE civil works budget. Now, Corps researchers are using artificial intelligence (AI) and operations research methods to help prioritize and schedule dredging operations. This new work was presented in a July 2022 report by Carol Coleman at ACE's Engineer Research and Development Center (ERDC).

"These models are not about dredging operations," said Dr. Ned Mitchell, an ERDC researcher cited in the report. "This is not about how to dredge," he added, "it is more about how to manage the dredging program, both from a budgetary standpoint and a scheduling standpoint."

The new modeling provides answers regarding priority locations, the extent of dredging required, frequency and the best sequencing of work and how to draw the highest number of competitive bids. The result is more cost-effective spending, perhaps saving as much as $100 million/year, money that could go to smaller projects that usually don't get funded.

In an update report titled "Dredge Optimization Using AI" ACE cites ongoing work and some initial successes. (See illustration) including:

- *Channel portfolio analysis and dredge sequencing have more efficiently targeted dredge utilization.*
- *While the cost per cubic yard is not less due to inflationary factors, several bids have been below the government estimate.*
- *Lesser disruptions from having to move dredges between active projects.*
- *Fewer no bid or bid busts at Mississippi River Baton Rouge to Gulf hopper contracts (which was a past challenge).*

This effort is saving money: $3.7 million at Mobile harbor, for example. And there are operational efficiencies, in the Gulf Region, for example, rotating contracts allow for work assignments anywhere to address emergency shoaling needs.

Dredging: still hard work. But now working smarter.

Autonomous Underwater Ground Vehicle

Dredging Capabilities from Beach to Deep Seafloor

A series of autonomous underwater ground vehicles (AUGV) that can transition from the ocean up through the surfzone and onto the beach aims to bridge the gap between open water and the beach.

Filling this vital gap near shore with a cost effective and adaptable platform also opens the opportunity for long-term persistent environmental study in the surfzone and near shore where other platforms cannot operate, says Plymouth, Mass. based Bayonet Ocean Vehicles, manufacturer of the person-portable amphibious tracked vehicles.

"Dredging operators face many challenges in gathering data both before, during and after operations," the company said. "The Bayonet AUGV can handle all of these challenges from pre-job surveys to turbidity and real time data collection, as well as change detection monitoring post operations."

Bayonet's product line consists of three vehicle sizes: the Bayonet 150, 250 and 350, providing the ability to scale the vehicle size, configuration and power to meet the demands of the payload, operation duration and environment. All three Bayonet vehicle sizes are also available in an HD configuration, which increases the torque and power of the vehicle to meet more demanding conditions and/or heavier payloads.

Bayonet says its range of autonomous vehicles offer dredging operators savings in time, safety and cost of operations.

- Autonomous operations reduce the number of survey staff needed.
- Capable of surveying entire beach restoration from dune to sea.

All images: Bayonet Ocean Vehicles

- Eliminates the hazards and time restrictions of sending a person into the ocean for data collection.

- A platform that can perform multiple roles in an operation reducing the number of people and tools needed to complete a job.

The Bayonet AUGVs can be deployed ashore or at sea and operate in depths up to 100 meters. The vehicles have a typical range of 10 miles submerged and 24 miles dry, and operate at speeds up to 1.5 knots. The vehicles' low profile and high stability allows them to penetrate the surf zone with up to 6 feet wave height and collect data independent of sea state and weather providing more days on task. Low domestic power draw provides static endurance of 100 days for continuous observations.

Bayonet vehicles are built on OPENSEA from underwater robotics software company Greensea Systems, based in Richmond, Vt. OPENSEA provides Bayonet AUGVs with advanced capabilities and rapid system integration so they can be fitted with a variety of environmental, oceanographic, hydrographic, benthic and industry specific sensors. Installations have included sidescan, CTD, magnetometers, acoustic releases, vibracores, penetrometers, video and photographic imagery. Bayonet adds that standalone guest sensors can be attached easily in the field or workshop integrated. Three single operator modes are available: autonomous, tethered or RF link buoy, and with the addition of Safe C2, also from Greensea, operators' reach can be extended to control and monitor the vehicle to over-the-horizon or multiple locations.

Voyager

Space Perspective

Space tourism company Space Perspective is converting an offshore support vessel (OSV) to function as the world's first "marine spaceport". The Florida-based company in November 2022 announced it had acquired the 292-foot-long vessel from Edison Chouest Offshore as the first in its planned global fleet of converted spaceport vessels to support the mobile launch of its balloon-driven passenger spacecraft.

The 2003-built Jones Act vessel C Challenger has been renamed Voyager and is currently being converted by Conrad Shipyard following preparatory work by Gulf Ship. Modifications are expected to be completed later this year and will include the addition of the SpaceBalloon launch system and a space capsule A-frame, which will house Space Perspective's spaceship Neptune using a specially designed cradle on the aft deck. The ship is also being retrofitted to run on cleaner-burning biofuel. Classification society ABS is supporting the reactivation and modification efforts with class, engineering review and regulatory services.

Initially homeported in Florida's Port Canaveral, the ship will transport passengers to an approved offshore location where the SpaceBalloon will fill with hydrogen and lift spaceship Neptune and its passengers 20 miles above the Earth. At the end of the six-hour flight, the pressurized capsule will splash down gently into the ocean. Fast rigid-hulled inflatable boats (RHIB) from Fluid Watercraft will arrive to stabilize the capsule, which will be lifted back onto the Voyager by a custom-built A-frame provided by Supreme Integrated Technologies. Voyager's marine operations will be supported by Guice Offshore.

Space Perspective will launch its spaceship from land at Kennedy Space Center in Florida, and now also from sea thanks to its new vessel.

"The future of space travel is on the water," said Taber MacCallum, founder and co-CEO of Space Perspective. "MS Voyager unlocks flexible launch locations, ideal launch conditions and more frequent launch opportunities."

According to Space Perspective, its fleet of spaceport vessels will allow launches to move into better weather areas for year-round operations, rather than being stuck in one place, as is the case for land-based launches. "And by moving with the sea breeze," the company said, "there is virtually no wind across the deck. This enables more frequent launch opportunities, as well as more options for the time of day, including sunrise and sunset nighttime stargazing flights for explorers."

The company added that its marine-launch enabling assets will help it to more rapidly capitalize on a commercial space travel market expected to reach more than $8 billion by 2030. With plans to launch in 2024, Space Perspective is currently selling tickets for $125,000, with more than 1,100 sold to date.

Vessels

St. James Parish Police RHIB


Ocean Craft Marine

Ocean Craft Marine (OCM) based in Annapolis, Md., has delivered a new police boat to the St. James Parish, La. Sheriff's Office Special Response Team (SRT).

The St. James Parish Sherriff's Office is adding the Ocean Craft Marine 8M Law Enforcement (LE) Interceptor rigid hull inflatable boat (RHIB) to its assortment of patrol craft in order to augment their riverine capabilities with the latest in high-performance hull designs. The Sheriff Office will utilize the new vessel to increase the effectiveness and timeliness of its response to domestic incidents, counter-narcotics operations and natural disasters.

Ocean Craft Marine's 8M Law Enforcement (LE) Interceptor incorporates a military-grade Hypalon pneumatic tube-set, a T-top with integrated electronics mast, fore and aft tow posts, and an aft a-frame with an integrated outboard motor guard. The new police boat is powered by twin Mercury Marine SeaPro 150-horsepower outboards.

"The new boat's on-water performance is truly remarkable with an incredible lightning quick hole-shot and time-on-plane, and with very predictable seakeeping characteristics and the ability to carve amazingly tight high-speed tactical turns due to Ocean Craft Marine's advanced concave reverse-chine design Air-Hull," the builder said.

Vessels

Boston FD Dive Boat

Moose Boats

Vallejo, Calif. boatbuilder Moose Boats announced it has been selected to build a custom dive boat for the Boston Fire Department's Special Operations Dive Team. The model M1 will be 46 feet long and powered by two Cummins QSC 8.3-liter engines delivering 1,200 horsepower.

According to Boston Fire's Captain Doug Felton, "The Boston Fire Department is looking forward to upgrading our current Dive Team boat to a Moose Boats, M1. The M1 will allow us to operate a dive boat year-round, as opposed to our current seasonal asset. The wider beam and catamaran hull will give us greater stability in the tumultuous waters in and around Boston Harbor. The enclosed cabin will extend our on-scene effectiveness by reducing fatigue from the elements during long-duration dive operations."

This boat will be a major upgrade from team's current 2010-built 30-foot dive boat, Captain Felton said: "With frigid winters and blistering summers, the Boston Fire Department Dive Team will increase its operational capability all year long despite the New England weather. Custom dive tank holders on the aft deck will increase ergonomics and keep deck space clear while underway."

Hamilton AVX Express controls will allow for tight-quarters maneuverability that is sometimes needed in Boston Harbor, and the catamaran's inherent shallow draft will allow this boat to go into shallow waters that are inaccessible to other boats.

Miss Agnes


USACE

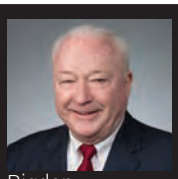
The U.S. Army Corps of Engineers, Mobile District and Tennessee-Tombigbee Waterway Development Authority held a ceremony to officially welcome a new survey vessel to its fleet in Columbus, Miss., April 28, 2023.

The Miss Agnes, built by Theodore, Ala. based Silver Ships, is a custom 26-foot multibeam and single beam capable marine survey vessel that features an enclosed center console, a three-monitor survey station, and an air conditioner unit that is paired with a generator. Powered by twin 200-horsepower Mercury SeaPro outboards and includes a double jack plate which simultaneously controls both engines when lifting or lowering them within the water.

"Miss Agnes will conduct hydrographic survey analyses along the Tennessee-Tombigbee Waterway," said Justin Murphree, USACE Operations Project Manager in the Columbus, Mississippi. "This survey vessel is custom built to survey inland waterways and shallow draft operations in the Tenn-Tom."

The Miss Agnes is named for the late Mrs. Agnes Goodman Zaiontz, a former office manager for the Tennessee-Tombigbee Waterway Development Authority since its opening in 1985. Zaiontz began her time with the authority as local volunteer. Shortly after the waterway's grand opening, she became a full-time employee where she ultimately served for over 34 years. Zaiontz was a well-known, beloved, and respected personality at the Tenn-Tom Waterway.

People & Companies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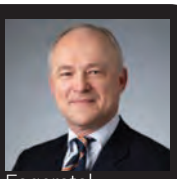
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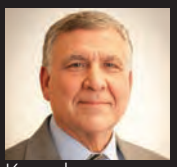
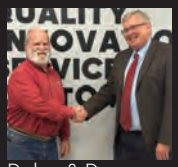
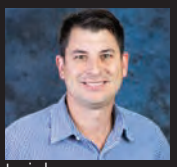

Krewsky


Karri


Hamilton


Dolan & Dugan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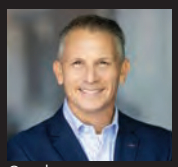
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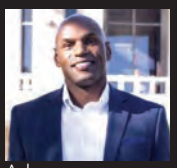
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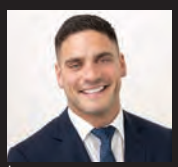
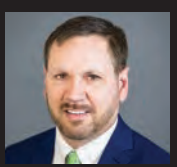

Luongo


Marshall


Young


Overstreet

Rigdon Retires at Tidewater

Tidewater announced Larry Rigdon has chosen not to stand for reelection as nonexecutive chairman and will retire from the board on June 26. Dick Fagerstal, Tidewater's lead independent director, has been asked by the board to serve as nonexecutive chairman assuming he is reelected to the board.

Tyler Named BMT Chairman

BMT appointed Ian Tyler as chairman of BMT Group Ltd. Tyler joined the board on May 1 and will assume the role of Chairman in early June.

Leadership Change at TAI Engineers

S&B announced updates to the management team of TAI Engineers, which include the promotion of Captain William Krewsky, PE (USCG Retired), to president and Krishna (Kris) Karri to senior vice president operations and chief engineer. Krewsky succeeds Anil Raj, PE, TAI's founder and president, who will remain in an executive advisory role with TAI.

Hamilton Takes the Helm at Propspeed

Propspeed promoted Marcus Hamilton from the international sales director to the position of CEO.

DSC Dredge Promoted Dugan

DSC Dredge appointed Doy Dugan to succeed Kevin Dolan as vice president and chief financial officer. It has also promoted Scott Laiche to the position of Vice President of Engineering.

Coplen Joins Crowley as VP

Crowley named Mark Coplen as vice president of project management for Crowley Wind Services.

AAM Hires Zech

All American Marine has appointed Daniel Zech as the its new business development manager.

Brennan Named National Hurricane Center Director

NOAA has selected Mike Brennan, Ph.D., to serve as the next director of NOAA's National Hurricane Center.

HOST Names Adams HSE Director

T. Parker Host (HOST) has appointed Jarred Adams as its new director of health, safety and environment.

Harvey Gulf Hires Luongo as Executive VP

Philip Luongo has joined Harvey Gulf International Marine as executive vice president of sales.

Metal Shark Hires Marshall as Executive VP

Metal Shark appointed Jason Marshall as its new executive vice president – programs.

Austal USA Promotes Young, Hires Overstreet

Austal USA promoted Chris Young to vice president of production operations. The company also hired Adam Overstreet as vice president of legal affairs and chief compliance officer.

Marine News 2023 Editorial Calendar

January 2023

Ad close Jan. 4

E-Magazine Edition:

U.S. Offshore Wind:

Shipbuilding, Ports & Logistics

February 2023

Ad close Jan. 20

Power & Propulsion

- Passenger Vessels
- Mariner Training & Education
- Safety Equipment

Event Distribution

PVA Maritrends: Feb 2-5, Long Beach, CA

CMA: Mar 28-30, Stamford, CT

IPF Wind: March 28-30, Baltimore, MD

Ferry Safety & Technology: April 1, New York, NY

March 2023

Ad close Feb. 28

E-Magazine Edition:

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

April 2023

Ad close Mar. 17

Towboats, Tugs & Barges

- 2023 Shipbuilding Report
- Navigation Technology
- U.S. Offshore Wind

Event Distribution:

OTC: May 1-4, Houston, TX

SeaWork: June 13-15, Southampton, UK

Inland Marine Expo: May 31-June 2, Nashville, TN

May 2023

Ad close April 21

E-Magazine Edition:

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

June 2023

Ad close May 19

Combat & Patrol Craft

- Navy & Coast Guard Shipbuilding
- Autonomous Vessels
- Dredging

Event Distribution:

WEDA Dredging Summit: July 17-20, Las Vegas, NV

Multi-Agency Craft Conference: Dates & Location TBD

July 2023

Ad close June 22

E-Magazine Edition:

The Green Marine Annual: New Products & Innovations

August 2023

Ad close July 21

Boatbuilding & Repair

- Naval Architecture & Marine Engineering
- Shipyard Equipment
- Workboat Communications

Event Distribution:

SNAME Maritime Convention : Dates & Location TBD

September 2023

Ad close Aug. 25

E-Magazine Edition:

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

October 2023

Ad close Sept. 18

Offshore Energy

- Vessel Repair & Conversion
- Electrification & Alternative Fuels
- Deck Machinery & Cranes

Event Distribution:

Clean Gulf: November. Dates TBD,

November 2023

Ad close Oct. 20

The Workboat Edition

- Top Vessels of 2023
- Power & Propulsion Technology
- U.S. Shipyards

Event Distribution:

International WorkBoat Show: Dates TBD, New Orleans, LA

December 2023

Ad close Nov. 30

E-Magazine Edition:

Workboat Technology: Best Marine Technology & Service Innovations of 2023

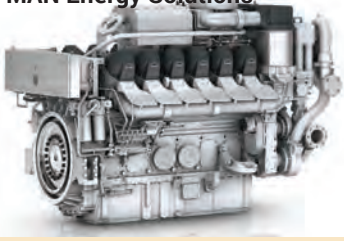
Products

1 VETUS Maxwell

2 In-Mar Solutions

3 Caudwell Marine

4 MAN Energy Solutions



5 OXE Marine

1. VETUS Wind Turbine Hatches

Rugged, heavy-duty hatches built to withstand tough conditions of either onshore or offshore wind production environments; produced to highest quality design standards and to offer ease of installation.

Innovative designs, low profile with anodized aluminum frames in multiple sizes and optional configurations. Can be opened from inside or outside. Hatches can be shut completely watertight or secured with small air gap for ventilation.

https://vetus.com/usa/

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

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

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

www.inmarsystems.com

3. Caudwell Marine Diesel Outboard

U.K. based Caudwell Marine said its new diesel 300hp outboard will be delivered in early 2024 following final validation and durability testing on boats in Lowestoft, U.K., and hot environment testing in Dubai. Aimed primarily at the commercial and military markets, the outboard features a marine proven 300hp, V6 turbo charged high performance diesel engine. The product features a patented integrated steering system known as an 'Axis Drive', which articulates steering from the lower unit only, with the powerhead and upper leg section remaining stationary in the turn. The engineering ensures the propellers are always effectively deployed to deliver full power throughout the turn.

4. MAN 175D

MAN Energy Solutions' MAN 175D high-speed engine range, which includes 12-, 16- and 20-cylinder variants with outputs ranging from 1,500 to 4,400 kilowatts, is now formally approved to operate 100% on standard biofuels such as hydrotreated vegetable oil (HVO) and fatty acid methyl ester (FAME) without any technical adjustments. Due to the lower energy content of FAME fuels, the engine's maximum continuous rating (MCR) would drop if no correction measures were applied, MAN said. Therefore, the manufacturer developed a solution that allows the correction of the load by means of a fuel adaption control ensuring full MCR power, also when operating with 100% FAME fuels.

5. OXE Hybrid 450

OXE Marine's OXE Hybrid 450 is a new hybrid concept engine combining the diesel drive of OXE Marine's outboards with electric drive. The 450hp concept engine is based on OXE Marine's diesel outboard OXE300. By equipping the existing rig with a 400-volt electric motor connected to a lithium-ion battery, additional opportunities for fuel savings are achieved along with the benefits that pure electric operation offers. In combination with HVO100 biodiesel, the OXE Hybrid 450 can reduce carbon dioxide emissions compared to a traditional gasoline-fueled outboard. Thanks to the fact that the electric motor drives the power transmission directly, it can also be used as a generator to charge the battery during diesel operation.

Marine Marketplace

NEW PRODUCTS

ADVERTISER INDEX

Page	Company	Website	Phone#
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23	All American Marine	www.AllAmericanMarine.com	(360) 647-7602
29	Appleton Marine, Inc	www.appletonmarine.com	(920) 738-5432
17	Conrad Industries	www.conradindustries.com	(985) 384-3060
41	Creative Systems	www.ghsport.com	(360) 385-6212
C2	David Clark Company	www.davidclark.com	(508) 751-5888
31	Environmental Marine, Inc.	www.envmar.com	(606) 561-4697
19	Fincantieri Bay Shipbuilding	www.fincantierimarinegroup.com	Visit us online
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25	Massa Products Corporation	www.MASSA.com	(781) 749-4800
37	McDonough Marine Service	mcdonoughmarine.com	(504) 780-8100
C4	R.W. Fernstrum & Company	www.fernstrum.com	(906) 863-5553
41	Rhotheta International Inc	www.rhothetaint.com/marine	(954) 495-8700
31	Ribcraft USA LLC.	www.ribcraftusa.com	(781) 639-9065
5	Thordon Bearings	www.thordonbearings.com	Please visit our website
15	Timberland Equipment Limited	www.timberlandequipment.com	(519) 537-6262
1	United Safety / Fireboy Xintex	www.unitedsafetycorporation.com	Visit us online
7	Volvo Penta Americas	www.volvopenta.com	(757) 403-8404

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INTERNATIONAL WIND TURBINE & FOUNDATION INSTALLATION VESSEL MARKET FORECAST

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

- Over 100 turbine and foundation installation and maintenance vessels will be required for planned offshore wind projects during the next decade.

- Rapidly growing wind turbine sizes, greater water depths and increase in foundation size will soon make almost all current vessels redundant by 2025.

WORLD ENERGY REPORTS

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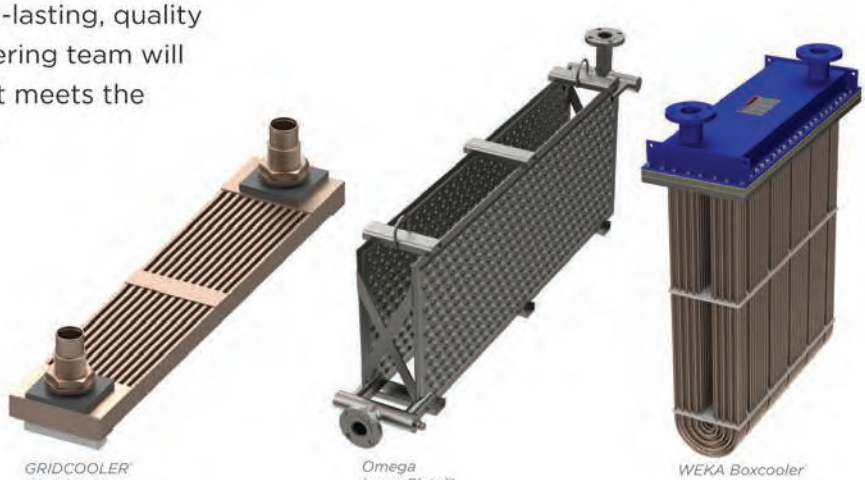

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