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Marine News

MAY 2026

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Rebuilding U.S. Ship Construction Starts at the Repair Yards

Inland Insights
Jones Act Under Fire

Port of Corpus Christi &
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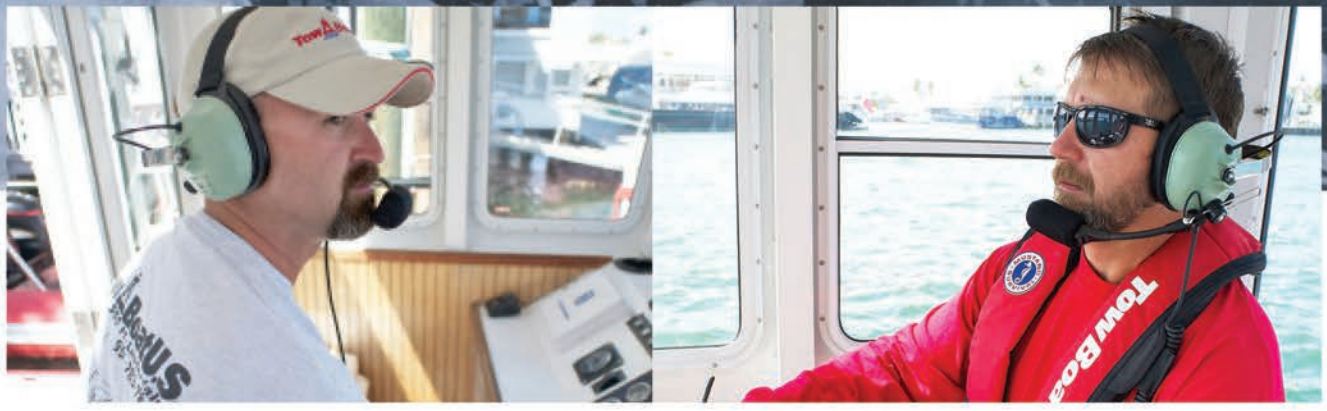

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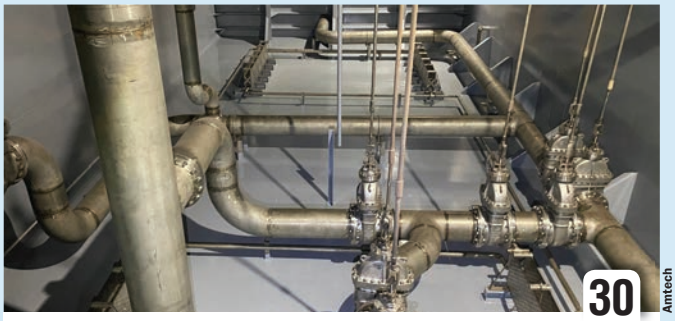

Amtech

On the Cover

Amtech recently delivered the ATB Battery Park & MAM 141 from Gulf Marine Repair in Tampa, Florida, a major conversion and life extension project.

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Editor's Note

Greg Trauthwein, Editor,
trauthwein@marinelink.com

Sorting through the news cycle noise today can be a challenge, with wars raging in Iran and Ukraine, a political scrum and resulting historic DHS shutdown, a flurry of new boatbuilding and boat tech entrants coming to the market [seemingly] daily, plus the wait for demand signals and funding for the long-discussed U.S. maritime renaissance. And that's just the morning news cycle!

Amtech's Bob Kunkel again graces our pages with a no-nonsense look at the U.S. industry, and for anyone who knows Kunkel, the article is straight to the point. Starting on page 30 as he contends the first step back to U.S. shipbuilding dominance starts in the repair yard, but if you need a quick synopsis of the article, perhaps best summed up in this excerpt:

> *We emphasize "commercial" simply because the U.S. government is rapidly announcing new multiple USCG ice breaker contracts, U.S. Navy LSM construction, the Navy rushing to autonomous logistics, RFPs for support vessel designs, and expedited nuclear submarine contracts for modules and hulls.* **These are programs and budget funding that will eat up available U.S. shipbuilding capacity and labor faster than a rescue dog attacks his first bowl of kibble at the new foster home.**

This month Barry Parker writes about maritime industry's 'data problem' in the context of larger ships, but the efficient, effective gathering and use of data analytics is a topic that reaches down, to and through every level of maritime. I understand the challenges inherent in taking practices established over generations and making the switch to an unfamiliar system and process, a challenge that applies to all levels of maritime, but particularly smaller organizations. But as Parker writes, it's about taking a step rather than a leap, with a long-view of the savings throughout the fleet.

Last but certainly not least is our interview with **Kent Britton, CEO, Port of Corpus Christi.** Port investment and technology were focus of our recently concluded **Port of the Future Conference and Expo in Houston**, and our deep dive into the Port of Corpus Christi was in-step with this annual event. POCC is one of the country's – if not the world's – most consequential energy gateways, and a central export valve for U.S. crude oil and a fast-rising platform for LNG. Among other topics, Britton discusses how the Corpus Christi Ship Channel Improvement Project – deepening the channel from 47 feet to 54 feet (MLLW) and widening it from 400 feet to 530 feet, with additional barge shelves built in for safety and operational fluidity – will go a long way in cementing its position as a leading energy hub.

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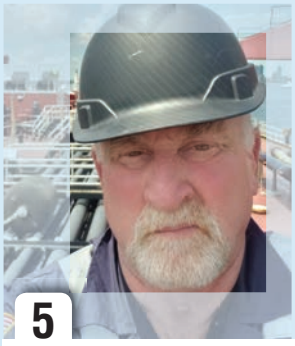

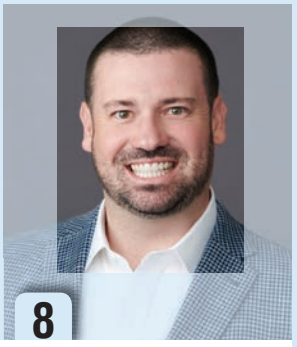

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8 Tracy Zea
is the President and CEO of Waterways Council, Inc.

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American Waterways, Global Volatility: Making the Right Policy Choices

By Jennifer Carpenter, President & CEO, AWO

Today's headlines bring constant news of international shipping hubs across the global supply chain experiencing major volatility and disruption – from Iran sending shockwaves through global energy markets by forcefully obstructing vessel traffic in the Strait of Hormuz; to the Iran-backed Houthis in Yemen signaling intent to restart attacks on shipping in the Red Sea; to China detaining Panama-flagged vessels in an escalation of ongoing disputes over the Panama Canal; and beyond.

By contrast, the American tugboat, towboat and barge industry continues to move our nation's cargo on U.S. domestic waterways, safely, securely, and reliably. Even with the occasional curveball from Mother Nature causing delays in one part of the system or another, dedicated and resilient U.S. mariners continue to deliver without fail. Domestic maritime's ability to serve as a beacon of stability despite geopolitical upheaval is not solely attributable to skill, grit, and experience, as critical as those are – it's also the product of public policies that enable the industry to keep moving, thriving and innovating. But those policies cannot be taken for granted – they represent choices made by policymakers to consciously shape an operational environment that reflects our industry's fundamental importance to our nation's economy, supply chain, and national security, and to the everyday lives of Americans. Today, we need policymakers to make the right choices in support of this essential industry, starting with terminating the historically long, overly broad, unnecessary Jones Act waiver currently in effect.

The issuance in March of a 60-day Jones Act waiver, allowing foreign-flagged vessels to move oil, natural gas, coal, and fertilizer between U.S. ports – a waiver already unprecedented in both length and scope and recently extended for an additional 90 days from the May 17 expiration date – has had no impact on the price of gasoline domestically. Meanwhile, the waiver has created serious vulnerabilities.

The waiver applies to domestic markets where no American vessel shortage exists, allowing foreign vessels to navigate our domestic waterways freely, directly undercutting American companies that play by the rules and follow U.S. law. This puts American vessel owners, mariners and shipyards at a disadvantage and undermines our supply chain reliability while making our waterways less safe. As legal observers have noted, a Jones Act waiver is not a waiver of U.S. tax, immigration, labor or environmental laws, but it is unclear how the federal government intends to ensure that foreign vessels using the waiver are fully compliant with applicable laws – a situation that is unfair at best, and profoundly dangerous at worst.

Particularly at a time of heightened risk of terrorist attacks on U.S. soil, the Jones Act serves as a security bulwark on our waterways by guaranteeing that it's American mariners supporting the Coast Guard's homeland security mission on our inland rivers, coastal routes, and Great Lakes. The Coast Guard and other federal agencies are simply not resourced to protect against security threats from foreign vessels and crews with unfettered access to U.S. domestic waterways.

Put simply, this Jones Act waiver throws open America's maritime borders to foreign vessels and crews and puts American workers last. It's incompatible with the goal of restoring American maritime dominance and ignores the targeted, case-by-case waiver process provided by current law when genuine transportation needs cannot be met by American vessels. This gut punch to American mariners should be reversed immediately.

Another critical policy choice to be made to keep American commerce flowing is continued investment in the safety and efficiency of our waterways system. This not only means providing robust funding for locks, dams, dredging and Coast Guard buoy tenders to prevent congestion in our rivers and harbors – it also means encouraging sensible permitting reform to enable more efficient infrastructure development; continuously building on the strong cooperative framework between industry, the Coast Guard and the U.S. Army Corps of Engineers to manage high and low water conditions on our inland river system; establishing coastal navigation safety fairways to ensure safe vessel transits in crowded, multi-use waterways; and ensuring that important Coast Guard services such as mariner credentialing and vessel documentation that keep the Marine Transportation System running are not held hostage to lengthy Department of Homeland Security funding lapses like what we have experienced these past several months.

Alongside modernized physical infrastructure and safe navigation routes, the stability and resilience of our domestic maritime supply chain also depend on a regulatory environment that encourages safety, efficiency, and innovation. To that end, the Coast Guard must prioritize long overdue implementation of regulations required by the Vessel Incidental Discharge Act to finally create uniform standards for vessels in interstate commerce; take a risk-based, practicable approach to implementation of new cybersecurity regulations; and build on positive steps to reform the mariner credentialing process so that our essential workforce does not lose more mariners to frustration with bureaucratic inertia.

The American people have always been able to count on domestic maritime to keep our nation's commerce moving, including in today's unpredictable global environment. Now, more than ever, Americans need the Trump Administration and Congress to support the policies that make this vital work possible.

Insights

Inland Infrastructure

A New Approach to Inland Waterways Modernization

By Tracy Zea, President/CEO, Waterways Council, Inc.

As the national public policy organization that advocates for a modern, reliable, efficient inland waterways and ports system, Waterways Council, Inc. (WCI) continually seeks ways to improve the delivery of inland waterways navigation projects managed by the U.S. Army Corps of Engineers. And while more than $6 billion has been delivered over the past decade for construction and major rehabilitation for the inland waterways, with WCI securing $2.5 billion above the budget requests and $3 billion in supplemental funding since 2016, project delivery remains bottlenecked, delayed, and inefficient. Decades of cost overruns and construction delays stem from structural flaws in project management rather than technical or financial limitations. As a result, WCI is calling for a significant change in how the Corps delivers these inland projects.

Among our recommendations for delivery improvements (found in the WCI-commissioned HDR study **Recommendations for Improving the Delivery of Inland Waterway Capital Projects**) is the creation of an Inland Navigation Construction Organization (INCO). INCO would reside within Corps Headquarters to manage inland navigation modernization projects as a single, coordinated program rather than as a series of individual projects managed by various Corps' districts and divisions that annually compete for funding and prioritization.

The need for INCO is evidenced, in part, by the fact that only three major inland navigation capital projects have been completed in the last 28 years, while several others have experienced sharp cost overruns of hundreds of millions of dollars (in one case 600% over budget) and schedule delays extending decades beyond original estimates. The Olmsted Lock took 28 years to complete, and the Kentucky Lock addition is currently entering its 28th year of construction.

HDR's study underscores the overall fragmentation in the Corps' project prioritization, design, and construction as a central cause of poor execution. Inland navigation projects are spread across numerous river systems, states, and Corps' districts and divisions, further making consistent oversight difficult.

While the Corps is the Nation's engineers and builders with experience managing complex infrastructure programs, inland navigation projects have been treated as standalone

efforts, encouraging competition among individual projects rather than coordination across this national system with a geographic footprint directly touching 28 states.

Inland navigation projects rely on a hybrid funding model, with mega capital projects funded through 75% general treasury funds and a 25% nonfederal share from the Inland Waterways Trust Fund (IWTF), which is the repository of a 29-cents-per-gallon diesel fuel tax on commercial operators. Barge and towing companies are the only beneficiaries of the waterways system to pay tax for its use.

The Inland Waterways Users Board (IWUB), the federal advisory committee that advises the Corps and Congress on inland waterways infrastructure priorities, developed and recommended to Congress a long-term Capital Investment Strategy (CIS) to guide investment for IWTF projects. But the HDR study suggests that the Corps' annual project execution plan does not reflect the CIS. As a result, Congress receives differing messages from the Corps and nonfederal partners about project priorities, further complicating appropriations decisions and limiting federal spending.

As part of INCO to further improve transparency and accountability, WCI is also urging the Corps to establish a single Inland Program Manager to:

- Coordinate funding priorities across major and mega inland navigation projects.
- Conduct regular progress reviews of project scope, budget, and schedule.
- Serve as the primary point of contact for Congress and the IWUB.
- Ensure alignment between long-term investment strategies and annual appropriations. This structure is modeled after existing Corps' program organizations used for dam safety and military construction, which centralize oversight while allowing individual districts to retain responsibility for project delivery.

The Inland Program Manager can consolidate information across Corps Headquarters, Divisions, Districts, and design centers to reduce duplication and conflicting reporting. This can help identify risks earlier and provide lawmakers with more reliable information on project execution. Given federal workforce reductions that have depleted experience levels across the Corps, the Inland Program Manager can also underscore the importance of staff continuity and institutional knowledge that can be brought to bear on project delivery.

INCO would not change Congress's authority over appropriations, remove project delivery responsibility from Corps' Districts and Divisions, or require new statutory authority; rather, it would provide a clearer framework to coordinate existing functions.

With China completing a $10 billion mega inland-to-sea project in the South China Sea in less than one year that will reduce shipping by 350 miles, the United States is losing global competitive ground. Formulating INCO into the Corps process and creating an Inland Program Manager are relatively small steps toward modernizing our critically important inland waterways system to more efficiently meet the challenges of the world's transportation supply chain.

Ocean Minerals Are Becoming a Real U.S. Opportunity

Momentum around critical minerals in Washington is no longer hypothetical. Policymakers are now focused on practical steps to expand domestic access to the raw materials that underpin national security, advanced manufacturing, and modern energy systems. Ocean minerals are front and center of this conversation and the offshore industry is prepared to play a central role. Congressional attention is growing fast.

By Erik Milito, President of National Ocean Industries Association (NOIA)

A House Natural Resources Subcommittee

hearing recently examined regulatory barriers to deep-sea mining and how to position American companies to lead, while a March 26 House Science, Space, and Technology Subcommittee hearing focused on the strategic and economic stakes of U.S. seabed mineral development and reducing dependence on Chinese supply chains. Both hearings draw the same conclusion: offshore minerals are now a genuine Congressional priority.

Cobalt, nickel, manganese, copper, and rare earth elements are embedded in the technologies modern life depends on, including batteries, power systems, semiconductors, aircraft, ships, and data centers. Demand is rising as fast as electrification and AI-integration accelerate. Geopolitical competitors – China above all – dominate large portions of the global supply chain, giving the U.S. strong reason to develop reliable domestic and allied sources. We have already seen these same competitors move aggressively to expand their influence over international seabed governance and deepen their strategic presence in critical ocean corridors, making U.S. action more urgent than ever.

The United States has real offshore potential here. In both the high seas and areas falling within U.S. domestic waters and those of its allies, significant deposits of polymetallic nodules, crust, copper-rich sulfides, other seabed resources rich in critical minerals can be found. Develop-

ing them does not require building a new industry from scratch. It requires applying existing offshore expertise to a new resource opportunity.

America's offshore sector already responsibly brings the tools ocean mineral exploration and commercial recovery requires: advanced geophysical surveying, subsea robotics, remotely operated systems, real-time monitoring, and a deeply ingrained culture of safety and environmental performance. That technical overlap gives the United States a clear advantage in a sector where operational experience will matter as much as policy ambition.

Federal Policy to Help US Move into Action

Federal policy is beginning to match that potential. The Trump administration recently announced Project Vault, a public-private partnership backed by $10 billion in Export-Import Bank financing to build a U.S. Strategic Critical Minerals Reserve covering all 60 minerals on the U.S. Geological Survey's Critical Minerals List.

Unlike traditional government stockpiles, Project Vault is demand-led: manufacturers identify which materials they need, at what volumes, and make long-term financial commitments to ensure availability during supply disruptions.

On the regulatory side, the National Oceanic and Atmospheric Administration (NOAA) recently finalized revisions to its regulations under the Deep Seabed Hard Mineral Resources Act, creating a consolidated application process for exploration licenses and commercial recovery permits. The updated framework streamlines a regulatory structure to reflect scientific and technological progress, while maintaining environmental review and oversight.

NOAA also announced a major offshore mapping ini-

Washington Watch
Subsea Mining

tiative near American Samoa, covering more than 30,000 square nautical miles of federal waters. Beginning in early 2026, the effort will generate rich publicly accessible data on seabed geology, environmental conditions, and mineral prospectivity, supplementing decades of prior research by NOAA in international waters. Good data is the foundation of responsible development and of sound regulation.

Together, these steps signal a shift from conceptual interest to practical engagement. As global competition for critical minerals intensifies, the U.S. is uniquely positioned to lead, having led technology development, pioneered scientific research and environmental impact assessments, and with the only fully developed regulatory framework for ocean mineral exploration and development in national waters and the high seas.

Deep sea mineral development also fits naturally alongside traditional offshore energy activity. The vessels, ports, fabrication facilities, skilled workforce and breakthrough innovations that support oil and gas and emerging sectors, like offshore wind and carbon capture, can support mineral exploration too, not only extending the value of infrastructure already in place but accelerating our offshore economy.

The U.S. is no longer asking whether ocean minerals matter, it's moving to action. Sustaining that momentum requires regulatory agencies to keep frameworks predictable, science-based, and adaptable as technology evolves.

The offshore sector already has what it takes to lead responsibly, the vessels, subsea technologies, geophysical expertise, and safety culture built over decades in the Gulf and beyond. That foundation, combined with Washington's recent policy moves, gives industry the confidence to invest in a frontier the U.S. helped pioneer. Early leadership here means shaping the operational standards, environmental safeguards, and international norms that will govern the sector for years. Done right, ocean mineral development strengthens domestic supply chains, reduces dependence on foreign sources, supports high-value jobs, and reinforces the industrial base on which U.S. economic and national security depend.

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Electrification of Ferries

By Maggie Fechter, electrical engineer and naval architect at Elliott Bay Design Group

Pictured above: An example of a charging arm mounted on a platform near the terminal. Once a vessel is secured at the dock, the arm connects, delivers power, and disconnects before departure.

Ferries are typically designed to operate very close to population centers, contributing to urban pollution while also creating an ideal opportunity for significant in-harbor emissions reduction.

Internationally, the world is seeing an imbalance of efforts to develop and implement sustainable solutions in the maritime industry. More specific to ferry electrification and decarbonization, Europe is at the forefront of the effort, while the United States is lagging behind.

While ferries present an opportunity for emissions reduction, adoption of electrification varies significantly across regions.

Electric Ferries Across the World

There are approximately 15,400 ferries of all fuel types in operation globally, and the United States operates nearly 5% of those (about 750 total). However, when it comes to electric ferries, the United States operates only a few of the 200+ that are in operation worldwide. Meanwhile, European countries operate proportionally far more electric ferries, with Norway alone operating about 70.

The International Maritime Organization's (IMO) aggressive target for emissions reduction is one factor contributing to the development of electric ferries. However, these IMO regulations are not applicable to all vessels, including many domestic ferries.

In the United States, domestic vessels are primarily subject to the Code of Federal Regulations (CFR) as well as local and state regulations. With the exception of a few state requirements (e.g. California or Washington), the regulations to which vessels in the United States are subject are not nearly as stringent as those IMO regulations with which international vessels comply.

Despite global progress, the United States faces several societal and economic barriers that slow widespread adoption.

Challenges to U.S. Electric Ferries

One factor influencing electrification efforts is the underlying demand for ferry transportation.

First, it is worth noting that the United States does not rely as heavily on ferry transportation as many of the European countries that have outsized quantities of electric ferries. Although there are regions in the United States that depend on daily ferry routes, it is far more prevalent in Europe.

With a higher reliance on ferry transportation, Europe commissions more ferry vessels more often, giving them additional opportunities to electrify their fleets. In comparison, the fleet of ferries operated in the United States is aging, along with the traditional fossil fuel drivetrains onboard. Beyond demand, financial feasibility remains one of the most significant hurdles to electrification.

Cost Barriers to Electrification

Determining whether electrification can be cost-effective includes analysis of various factors such as ferry route, schedule, size, and time at dock; the more limited range of an electric vessel is often a critical consideration. Even if an electric vessel could provide operational savings, the significant cost of building not only the vessel itself but also developing and implementing shoreside charging infrastructure presents a considerable challenge.

In the United States, it is difficult to justify the price tag of electrification for operators that do not receive dedicated funding or face regulatory pressure to pursue emissions reduction.

One factor contributing to the high cost of vessels is the Jones Act, which requires commercial vessels traveling within the United States to be built in America. Shipyards frequently rely on imported steel and aluminum for commercial vessels, and, unfortunately, the global trade dynamics are creating additional expense on these critical materials for vessels of all types. There is a further added burden for electric vessels, as batteries and the materials of which they are comprised are also subject to price increases due to international trade practices.

While hybrid-electric vessels can offer benefits compared with fully electric vessels, it can be even more expensive to build them. Hybrid ferries require components for both electric and traditional power generation systems, and in turn they require more volume and/or weight capacity onboard to accommodate both systems. While the initial vessel investment is substantial, hybrid ferries can offer savings on shoreside infrastructure upgrades or fuel over the life of the vessel, compared to their all-electric and conventional diesel counterparts, respectively.

Electrification
Ferries

In addition to the cost, the evolving technologies that create opportunities for electrification also introduce operational challenges.

Emerging Technologies and Infrastructure Gaps

The first projects in the country to develop and put emissions-reducing and fuel-saving technologies to use come with their own set of challenges.

Since there is not yet a significant demand, the batteries required for electric ferries are difficult to source. This is especially true for vessels that must comply with the Buy America Act. To date, obtaining batteries for American ships relies heavily on international trade.

As is the case with all newer technologies, there is a learning curve with the commissioning, operation, and maintenance of electric ferries. Further, the available technologies for use in the United States are restricted to those limited options that are approved by USCG. While there are electrification studies and data from across the world, most of it is not readily available and in English for designers, owners, and operators in the United States to reference.

One additional challenge associated with the developing technologies is that there is not yet a standard ship-to-shore fast charging connector. An established standard could simplify choices for owners and result in longer-term solutions with greater technological support.

As these challenges continue to shape the pace of adoption, the industry is also looking ahead at what comes next.

Future Outlook for U.S. Ferry Electrification

The world is seeing a trend toward electrification and other emission reducing strategies. Compared to traditional ferries, electric ferries are quieter, smoother, and emit less diesel exhaust odors, so they provide a more comfortable ride for passengers.

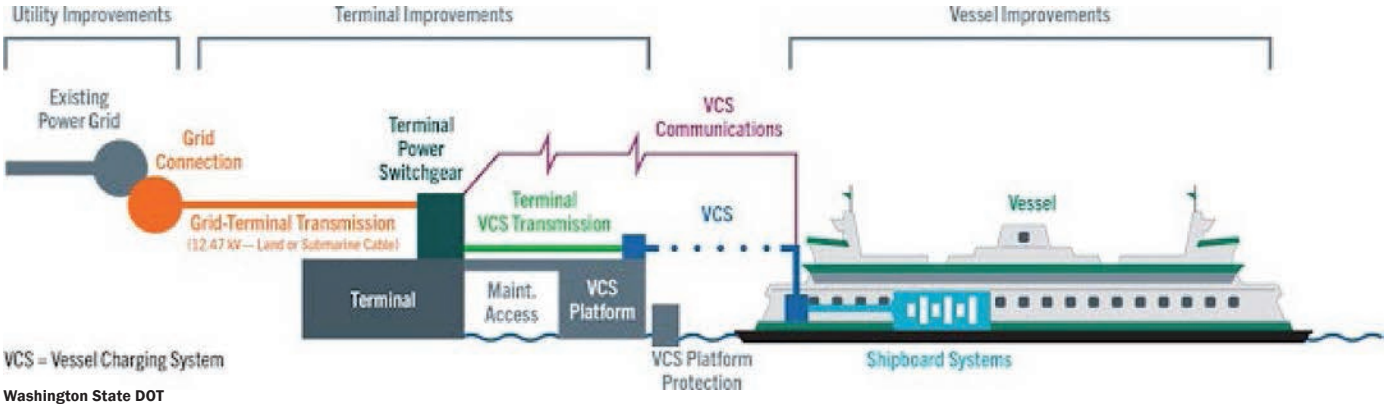
IMO regulations are becoming more stringent to reduce emissions from ships, which incentivizes electrification and decarbonization. While the United States does not currently have strong federal marine emissions requirements, there may be additional regulations in the future.

The initial investment for an electric ferry can be a challenge. However, technological developments are allowing electrification to become more cost-competitive with traditional combustion engines over the life of the vessel; electric ferries are trending toward lower maintenance demands and reduced fuel costs compared to internal combustion engines.

As the gap between international progress and domestic adoption persists, stakeholders across the U.S. maritime industry will need to evaluate how electrification fits into long-term fleet strategies.

While the complicated regulations, changing economic dynamics, and emerging technologies present challenges to owners and operators, EBDG offers design and engineering support to projects across the maritime industry. With experience supporting ferry systems and vessel design initiatives, our team is dedicated to helping clients find solutions to their unique concerns.

A snapshot of infrastructure that provides shore charging at ferry terminals.



Washington State DOT

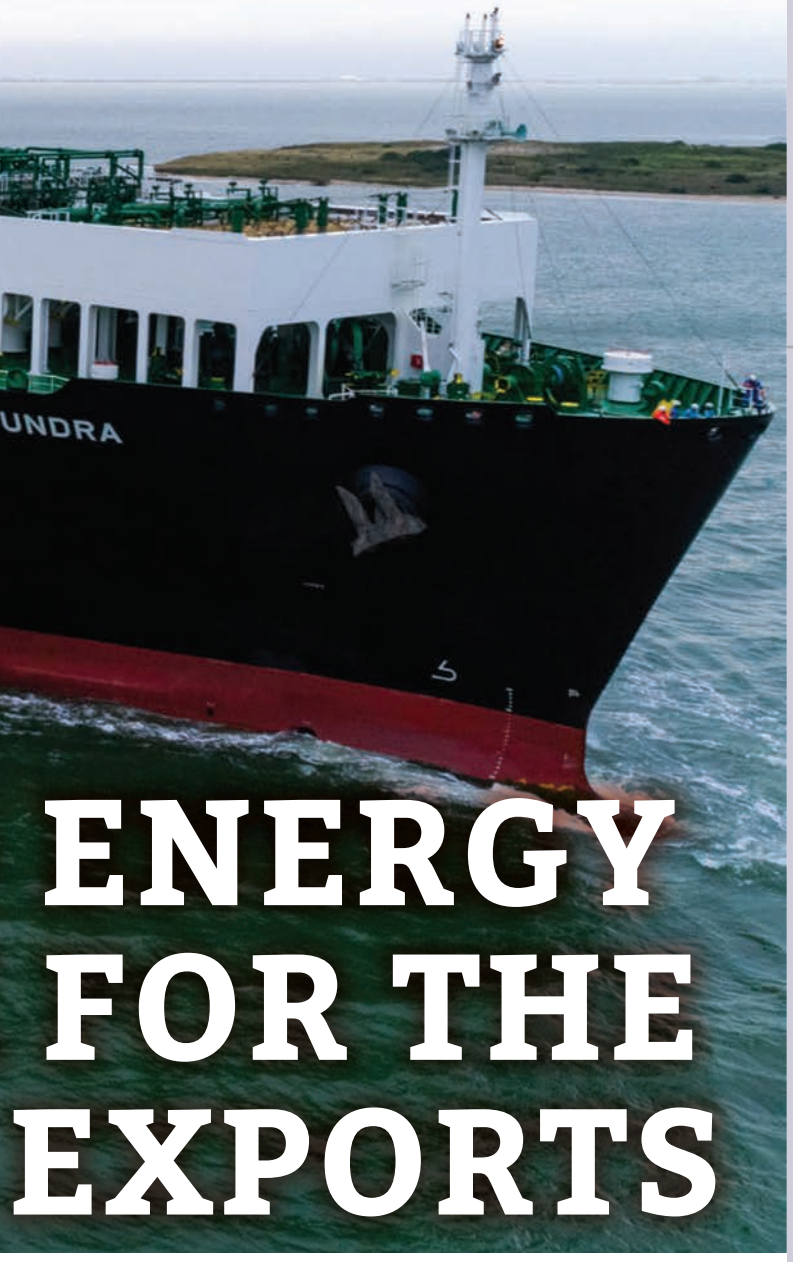
PORT OF CORPUS

DEEP WATER, BIG AND A PLAYBOOK NEXT ERA OF U.S.

All images Courtesy Port of Corpus Christi

By Greg Trauthwein

CHRISTI ENERGY FOR THE EXPORTS



Drive into Corpus Christi and you can feel the paradox that defines many port cities: the waterfront is everywhere, yet the maritime business that powers the place is easy to miss — until you look past the horizon of tanks, docks, and ship traffic and realize you're staring at one of the world's most consequential energy gateways.

By volume, the Port of Corpus Christi has become a central export valve for U.S. crude oil and a fast-rising platform for LNG—an industrial ecosystem that has grown at a pace few ports can match. In 2025, the Port and its customers moved 203.4 million tons through the Corpus Christi Ship Channel, a 1.5% decline from 2024's 206.5 million tons, as crude volumes softened modestly even while LNG continued to climb.

And in the background—quietly shaping everything from vessel size to berth productivity—Corpus Christi completed the kind of infrastructure program that changes a port's trajectory for decades: the Corpus Christi Ship Channel Improvement Project, deepening the channel from 47 feet to 54 feet (MLLW) and widening it from 400 feet to 530 feet, with additional barge shelves built in for safety and operational fluidity.

For Kent Britton, CEO of the Port of Corpus Christi, the growth is real—but so is the responsibility that comes with being a key node in the energy supply chain.

"People sometimes don't understand maritime even in port cities," Britton told me. "So I try to do the same thing in one little speech after another."

From Industrial Customer to Port CEO

Britton didn't grow up through the traditional port authority ranks. Nine years ago, he wasn't "in the port space" at all. His background runs through large industrial manufacturers—Glencore and Alcoa — followed by a move to

Port of Corpus Christi

"We're the third largest crude oil export port in the world, and we're the leading crude oil export port in the United States. 60% of the crude oil that gets exported out of the United States flows out of the Port of Corpus Christi; that's about 2.3 million barrels per day."

– Kent Britton,
CEO of the Port of Corpus Christi

Corpus Christi where he served as CFO at Sherwin Alumina, a plant with deep roots in the region's heavy industry.

In other words: Britton arrived as a customer. He understood how industrial operators think about costs, reliability, and throughput — how a few hours saved on a berth window can ripple across a refinery schedule, a pipeline nomination, or a charter party.

He joined the Port of Corpus Christi in 2017 as director of finance — right before Hurricane Harvey — became CFO in 2019, and moved into the CEO role about two and a half years ago. His leadership style reflects that "customer-led" view of port investment: don't build shiny things to admire; build what improves efficiency and competitiveness for the companies actually moving product.

POCC: Punching Above Its Weight

When Britton talks to locals, he leads with a statistic that's hard to ignore: Corpus Christi is now one of the world's major crude export gateways. The Port has been widely cited as the largest U.S. crude oil export gateway and among the top crude export ports globally, moving roughly 2.3 million barrels per day in crude exports in recent years.

The tonnage story is equally striking. Over roughly a decade, Corpus Christi's throughput has climbed from about 85 million tons to more than 200 million tons, driven largely by crude oil exports and supporting energy flows.

Yet the Port authority itself remains relatively lean. Britton puts headcount around 270 employees — a small number, considering the scale of cargo value moving through the channel every day.

And the economic gravity extends well beyond the Port's payroll. Texas Comptroller reporting has highlighted the Port of Corpus Christi's role in statewide trade and economic activity, including the Port's substantial share of Texas seaport trade value.

Britton's framing goes one step further: this isn't only an economic story.

"It's not just an economic driver," he said. "Think about the energy that we're supplying around the world… almost exclusively to our allies and trading partners… It's a matter of national security as well."

2025 Volumes: A Slight Dip—Driven by Crude

The Port's **2025 tonnage of 203.4 million tons** came in slightly below 2024, and Britton doesn't sugarcoat how much the crude number drives the narrative. When crude is the dominant commodity, even small percentage moves can swing the whole annual result.

Here's what the Port reported for 2025:

- **Liquefied natural gas exports rose 15.4% to 18.6 million tons**
- **Crude oil shipments fell 2.3% to 127.4 million tons**
- **Dry bulk declined 2.5%**
- **Agricultural goods fell 54%**

In Q4 2025, Port customers moved 50.1 million tons, compared with 54.0 million tons in Q4 2024 (a record

quarter). Leading commodities were crude, refined products, and LNG.

Britton's "behind the numbers" explanation is rooted in the post-2015 U.S. crude export era: the export ban was lifted, shale production expanded, and pipelines converged on Corpus Christi. That surge matured into the 2019–2020 period when major crude pipelines arrived and positioned the gateway for scale.

In the last three years, he characterizes growth as relatively flat—up slightly, up slightly, then down slightly—driven mostly by crude export variability rather than a change in the Port's underlying capability.

Meanwhile, the LNG runway is clearer. The Port's LNG story is closely linked to existing and expanding liquefaction capacity, and Port-reported data show LNG tonnage rising meaningfully year over year in 2025.

"The Biggest Thing We've Ever Done"

If you want to understand why Cor-

pus Christi is positioned for the next cycle—whatever oil markets do next—start with dredging, width, and geometry. The channel improvement project is the kind of infrastructure work that's easy to summarize and hard to execute:

- Depth increased from 47 feet to 54 feet (MLLW)
- Width expanded from 400 feet to 530 feet
- Barge shelves added for safety and traffic management

USACE and the Port marked completion in mid-2025.

Britton puts the project in historical context: other than the original opening of the Port, it's the most important capital program the channel has ever seen. And the benefits aren't theoretical; they show up in cargo economics, vessel loading, and reduced friction in daily operations.

With 54 feet, customers can more fully load larger tankers. Britton explained that the Port can now fully load Suezmax-class tankers and more fully load VLCCs — still not to absolute maximum, but materially higher — reducing the need for inefficient workarounds and improving the competitiveness of the gateway.

The channel isn't just deeper, it's more efficient. Britton points to a telling indicator: more crude moved with fewer ships, reflecting improved transit fluidity and less congestion.

And with capability comes optionality. With improved navigation infrastructure, the Port can credibly evaluate cargo and vessel classes that previously sat outside its sweet spot — container services, cruise calls, and additional industrial flows — while still being anchored in energy.

Capital Priorities: Customer-Led and Focused on Throughput

After you complete a generational channel project, the next question is always: what's next?

Britton's answer is practical and disciplined. Corpus Christi is a landlord port — its customers operate the terminals — and the Port authority's job is to provide the infrastructure and waterway reliability that makes those operators more productive.

So the metrics that matter aren't abstract port KPIs; they're operational outcomes:

- Reduced dwell time in the overall transit
- Faster turns at berth
- Less demurrage from waiting offshore
- More vessel calls handled per dock per year (through productivity and reliability)

Britton's "customer-led" approach means the Port watches for clear demand signals before committing major capital — particularly for projects that would be difficult to repurpose. That conservative posture doesn't mean slow; it means intentional.

Looking out five to ten years, he sees priorities like dock upgrades (to fully "commercialize" the deeper channel), potential rail improvements and yard capacity, and the possibility of a new turning basin to handle longer vessels that can now enter the channel but may not be able to turn efficiently in the inner harbor without additional geometry.

Funding Resilience: Grants as Accelerant, Not Oxygen

Ports love grants, but ports also know grants can disappear.

Britton's view: build a capital plan that remains viable without state or federal funding, and treat grants as accelerant — helping projects move faster or be built more robustly.

Corpus Christi has funded major work through a mix of user fees (including fees tied to the energy volumes moving through the system) and access to bond markets. The point isn't the instrument; it's maintaining the ability to execute even when funding cycles tighten.

Automation and AI: A "Force Multiplier"

When people talk "port automation," they often jump straight to container terminals — automated stacking cranes, autonomous yard tractors, AI-optimized gate appointment systems.

Corpus Christi doesn't operate a container terminal, but Britton is clear-eyed about where automation can matter for a landlord port: use technology to make the waterway more reliable, predictable, and efficient.

That includes:

- Tools that reduce fog-related delays (Britton cites roughly 30+ fog delay days per year)
- Better coordination among the many parties involved in a vessel movement: pilots, tugs, agents, line handlers, Coast Guard, harbormaster
- Back-office automation to keep the Port authority itself lean and responsive

The most intriguing thread is predictive analytics—particularly around shoaling and dredging cycles. If you can use sensor data and models to forecast where shoaling will

"[Clients of the port] all want the same thing. They want ease in and out of the waterway, quick time to their dock, as little time on their dock as possible, and then getting back out of here because shipping is incredibly expensive right now. We heard numbers to the tune of $13 million to charter a VLCC, for example, from here going to the far east. That's an astronomical number. So quick in, efficient loading, quick out is important to them."

– Kent Britton, CEO of the Port of Corpus Christi

occur and how fast, you can prioritize dredging resources more efficiently and reduce the risk of operational constraints emerging unexpectedly.

Britton described the Port's push toward a digital twin—a model that can integrate weather, resilience, shoaling, and operational data into a decision-support layer. For a gateway moving energy cargo at scale, shaving uncertainty is often as valuable as shaving minutes.

Environment, Resilience, and the Reality of the Gulf Coast

Corpus Christi sits in a hurricane zone and operates in a regulatory environment where air quality, water quality, and habitat are not optional considerations.

Britton rejects the idea that doing things "the right way" environmentally must be in conflict with competitiveness. In his view, strong standards and smart planning reduce risk, protect the community, and help sustain the operating license that ports ultimately depend on.

Resilience also has an operational dimension: if the Port can anticipate disruptions and plan maintenance and capital improvements proactively, it becomes a more dependable link in global supply chains—especially in energy, where reliability translates to strategic value.

Measuring Success

Britton's definition of success is both operational and strategic:

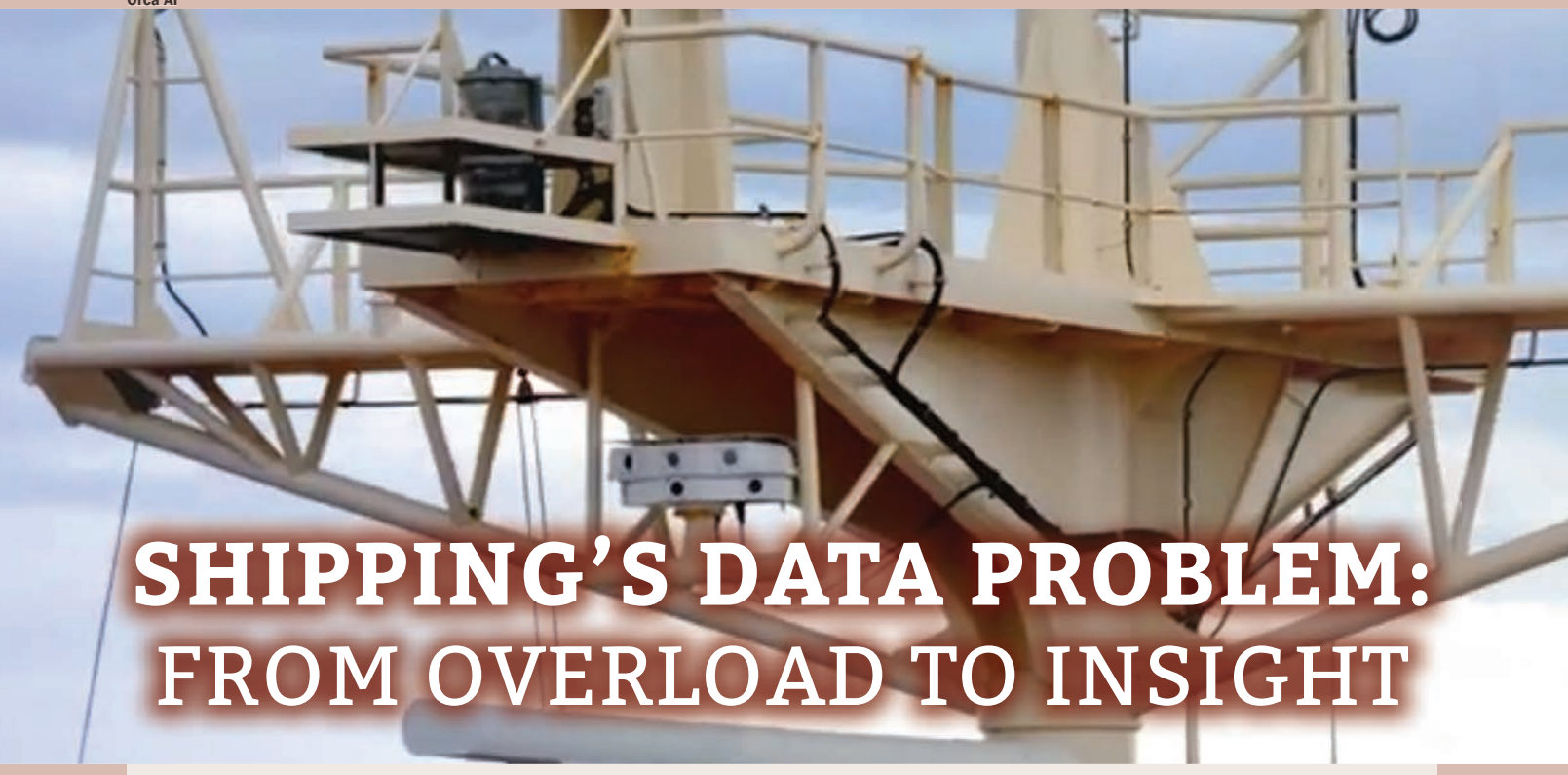
1. **Fully commercialize the deeper channel** by upgrading docks and associated infrastructure so customers can consistently capture the benefits of 54 feet.
2. **Attract new business** that diversifies the portfolio—without losing focus on what the Port does best.
3. **Keep existing customers moving faster and cheaper,** reducing friction that costs real money at today's charter and demurrage rates.
4. **Build the systems and maintenance discipline** to make infrastructure last not just decades, but a century.

That last point is easy to overlook. Growth makes headlines. But ports, at their best, are built for longevity—assets maintained, modernized, and made resilient enough to serve industries that will evolve in ways nobody can perfectly predict.

In Corpus Christi, the channel is deeper, the pathway is wider, and the Port has positioned itself to be more than a beneficiary of the last decade's energy boom. The next chapter will be written in how well it converts that new waterway capability into sustained industrial competitiveness—through disciplined capital, smart technology, and a relentless focus on the customers who turn a ship channel into an engine of national economic and strategic power.

If you want a simple takeaway, Britton offered it in his own way: stay in the lane—or, in Corpus Christi terms, stay in the channel—and make the channel the best, safest, most efficient route possible. Because when you do that at scale, everything else follows.

Orca AI



SHIPPING'S DATA PROBLEM: FROM OVERLOAD TO INSIGHT

By Barry Parker

Vessel owners of every size, shape and locale today face a mounting opportunity and challenge: effectively utilizing all of the data coming from their vessels, their fleets, and putting that information to work to make maritime operations more efficient and profitable.

At *"The Business of Shipping"* panel on Day 1 of the Connecticut Maritime Association's Shipping 2026 conference, a senior executive from a leading gas carrier operator put it plainly: "Our ships produce massive amounts of data … so much of it is captured … we don't know what to do with it."

That statement neatly captures the state of maritime digitalization today. Ships are now fully connected assets, continuously transmitting data ashore via satellite networks—both traditional geostationary VSAT systems, such as those provided by Inmarsat (now part of Viasat), and increasingly through low-earth orbit (LEO) systems like Starlink. Hybrid solutions, combining both, are emerging to improve speed and reliability.

The pipes are in place. The problem is what comes next.

From Data Capture to Data Confusion

Over the past decade, pressure to improve operational efficiency and meet emissions regulations has driven a surge in digital tools. These systems monitor everything from fuel consumption to engine performance, feeding both regulatory reporting frameworks — such as EU ETS — and internal analytics, including digital twin applications.

Consultancy Thetius described modern vessels as "dynamic digital hubs of connectivity and insight," but noted a persistent issue: the data itself remains fragmented.

As operations grow more complex and regulatory scrutiny intensifies, this fragmentation becomes costly. Data sits across platforms, inboxes, and spreadsheets, limiting its usefulness.

Chris Aversano of Wood Mackenzie sees the challenge less as technical and more human. "The issue isn't the data

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itself," he said. "It's what that data does to people and how it changes the way they work."

Regulation Driving Integration

Regulation is accelerating the push toward integration. In March 2026, the International Maritime Organization (IMO) approved a Strategy on Maritime Digitalization focused on interoperability, standardization, and data governance across jurisdictions.

Classification societies are positioning themselves at the center of this shift.

DNV's Veracity platform, for example, aggregates vessel data and distributes it to both operators and regulators. Its Emissions Connect module supports FuelEU compliance, including emissions reporting, credit banking, and fleet-level pooling.

Similarly, **Lloyd's Register** has consolidated its offerings into the **OneOcean platform**, aiming to unify data across safety, compliance, and operations. As Tony Brown, SVP of Product at OneOcean, notes, the industry is moving toward "a single ecosystem of decision-making tools that connect ship and shore."

The Push Toward a Single Source of Truth

The concept of a "single source of truth" is central to current digitalization efforts. Poor integration between ship and shore systems continues to slow decision-making and increase operational risk.

DNV's Craig Koehne emphasized this point at CMA, noting that shipowners are increasingly focused on "data-driven operations"—bringing more data ashore to enable faster, more accurate decisions.

Artificial intelligence is part of the equation, but cautiously

MOL

AI & Maritime

On the horizon, Artificial Intelligence (AI) is entering the maritime realm. One entrant, **Orca AI**, an automation specialist, now offers platforms linking the vessel bridge and the shore-side office. The company reports that its kit is deployed aboard more than 1,200 vessels- with customers including MSC, NYK, Seaspan, Gram Car Carriers, and Maran Tankers. A deal in the works with ship manager Anglo-Eastern is expected to bring Orca AI's vessel count to more than 2,000 ships. In a recent analysis conducted by **North Standard**, a leading mutual provider of P & I insurance, looking at 139 deepsea container ships trading globally, the results showed a 52% reduction in "high-severity close encounters" within 12 months of deploying the Orca AI platform. According to North Standard, "...AI situational awareness can strengthen performance regardless of legacy bridge hardware."

so. While AI can enhance analytics and automation, concerns around validation, trust, and safety remain, particularly in mission-critical functions like navigation and maintenance.

Breaking Down Silos—Or Creating New Ones?

Despite advances, data silos remain a major obstacle.

Aversano highlights a cultural dimension to the issue. At the executive level, data integration is widely accepted as inevitable. But at the operational level, reactions are mixed.

Greater transparency can improve efficiency, but it also exposes decision-making processes. "Once systems are connected across departments, there's less room to hide," he said. "That brings accountability—and sometimes resistance."

For crew and operational staff, the shift can feel more like surveillance than support. Increased reporting requirements and real-time monitoring add to workloads already strained by new fuels, routing complexities, and daily operational demands.

Platforms, Partnerships and the Digital Ecosystem

Technology providers are responding with integrated platforms and partnerships.

Bureau Veritas has taken a stake in **Orbit-MI**, linking emissions compliance tools with broader operational software ecosystems. Orbit-MI, in turn, is integrating with

Vega Reederei coastal fleet installing NexusWave connectivity service.

Vega Reederei

The Cargo Side

Much of the activity in maritime digitalization (and movement of data) discussed here occurs on the vessel side. But, similarly, the cargo side of the business has also seen islands of development but without centrality- as logistics data is often viewed as being proprietary. One unsuccessful attempt at innovation saw **TradeLens**, a joint venture between two giants in their respective arenas, **Maersk** and **IBM**, built around blockchain, shut down in 2022. Perhaps looking towards the future, two large competing U.S. West Coast ports (Long Beach- POLB and Los Angeles- POLA) are working together. At an early 2026 State of the Port event, POLA's Executive Director Gene Seroka highlighted that its "Port Optimizer" (a cloud based digital logistics platform developed by **WABTEC**) was being linked to a similar trucking appointment data system across the Bay at POLB. Similar to **Danelec** and solutions aimed at vessels, emissions reduction has been a driving force in the ports' efforts- perhaps offering a clue into ways forward.

platforms such as **Veson Nautical** and **SEDNA** to unify commercial and operational data flows.

Cyprus-based **Columbia Ship Management** is advancing a similar model, deploying Starlink connectivity across its fleet and integrating operations through the One-Link platform. The system combines voyage optimization, emissions tracking, and commercial analytics into a single interface.

One-Link CEO Pankaj Sharma describes the goal succinctly: creating "a shared operational reality" between ship and shore, where decisions are based on real-time data rather than delayed reporting.

The Human Factor

For all the technology, the human element remains central—and unresolved.

Aversano, a former seafarer, points to growing concerns among crews. Real-time visibility from shore can feel intrusive, while automation raises questions about long-term roles. At the same time, each new system adds to onboard workload.

This tension — between efficiency and burden, insight and oversight — may ultimately define the success of maritime digitalization.

From Data to Decisions

The industry has solved the problem of collecting data. The next challenge is turning that data into actionable insight without overwhelming the people expected to use it. As one executive put it at CMA: the data is there. The value is not, at least not yet.

Until the industry can bridge that gap, shipping's digital transformation will remain a work in progress.

All images courtesy Amtech

RESCUED BY THE WELDER'S WHIP

AND HORED BY THE NTER'S AY GUN

It is the fact that both State and Federal governments never understood the importance of shipping and shipbuilding. And with that never properly funded it through several previous Administrations to match the global capability. Long story short, our ability to compete with China is long gone.

By Bob Kunkel, Amtech

As a vessel construction manager with extended building experience in both the U.S. and South Korea, more than several opportunities have landed on our desks as Private Equity and Venture Capital analyze tanker tonnage and construction in the domestic trades. With the understanding these requests are based upon the current Persian Gulf and Venezuela issues driving that market we should also pay attention to the 2027 Maritime budget that allocates $1.5 trillion dollars for overall National Security and $65.8 billion set aside for U.S. Navy Shipbuilding.

Our domestic fleet is also tagged "National Security" and there is no doubt a surge will occur in U.S. Gulf petroleum movements. The world is grasping at where and how to move product ranging from crude to jet fuel and you can bet "National Security" will be the tag line. Our domestic oil and chemical markets are not exempt from those concerns. We are deep into the global debate whether it be Persian Gulf, U.S. Gulf, Venezuela or Northwest passage. Markets and energy aside, the rhetoric is now based upon an aggressive movement to reestablish U.S Shipbuilding.

The U.S. chaos builds upon the escalating cost of gasoline products. The spike has reached into chemical trades both wet and dry, industrial manufacturing, steel and household goods. As Amtech, we recently traded caustic soda to the largest Aluminum Smelter in Saudi Arabia on one of our managed chemical ships trapped in the Persian Gulf. Primarily used in the Bayer Process to refine bauxite ore into alumina, caustic soda acts as a solvent to dissolve aluminum-bearing minerals at high temperatures, separating them from impurities like iron oxide and the Saudi factory was in need of caustic soda to manage the smelter. Recent attacks by Iranian drones damaged the facility and production stopped. Gas prices aside, watch the effect on aluminum costs with this massive closure.

The short story is not all about energy.

Shipbuilding
U.S. Commercial Fleet

A Wakeup Call

The wakeup call should concentrate not only on the inflated cost of crude oil but also the downstream effect on shipping's industry partners and manufacturing. One of the single geopolitical inflationary effects will be shipbuilding itself. We are seeing the rush to execute building contracts in the Far East yards in an attempt to get ahead of the costs coming down the road. With six ships drydocking in South Korea during 2026, Amtech has already experienced inflated costs with the first vessel of over 35% due to energy and tariffs.

Look again at the aluminum example above when analyzing new U.S. construction costs. The U.S. Department of Transportation and Marad announced on April 6, 2026, $657 million in FY 2026 competitive grants to improve ferry infrastructure, enhance service in rural areas, and reduce emissions. Administered by the FTA, the funding supports new vessel construction, terminal upgrades, and expanded routes to improve accessibility, with applications open through May 11, 2026. The lesson is "timing is everything" and imagine investing in this market with escalating costs of aluminum affecting most if not all small ferry construction. Take that thought a "Maga" step forward and determine how the U.S. would move towards domestic aluminum manufacturing and even further downstream to determine how many coastwise registered vessels can properly distribute caustic soda, bauxite or other new commodities needed to rebuild our infrastructure.

The problem goes well beyond the U.S Navy.

Shipbuilding Capacity

The industry analysis concerning the ferry grants to date? Will the $657 million actually be viewed as a "subsidy" in a coastwise registered market that has never accepted a subsidy for construction? A question that was debated during development of the "Ships Act" and a question that should be debated.

The simple truth is U.S. domestic shipbuilding costs will increase and not decrease in the short term. With the current price levels for ATB tank barge or MR tankers being quoted, commercial new construction contracts and available drydock slots will "pause".

We emphasize "commercial" simply because the U.S government is rapidly announcing new multiple USCG ice breaker contracts, US Navy LSM construction, the Navy rushing to autonomous logistics, RFPs for support vessel designs, and expedited nuclear submarine contracts for modules and hulls. These are programs and budget funding that will eat up available US shipbuilding capacity and labor faster than a rescue dog attacks his first bowl of kibble at the new foster home.

Every response to the politically generated "Restoring America's Maritime Dominance" has developed into a rush to announce "shipyards of the future" at new Greenfield locations, robotics and software programs updating existing shipyards, and software or AI promises from every carpetbagger capable of developing a pitch book. There are a few shipyard locations and discussions that show promise and we hope they succeed. That said, the time needed to accomplish this

goal and also train an experienced workforce, is measured in decades no matter how much money you throw at it.

Listen to the domestic ATB owners, the inland barge operators and existing tanker owners. They are investigating life extension of current operating tonnage to continue serving the markets. They are correct and it reminds us of the New York Subway alert: **WATCH THE GAP.**

The answer to immediately developing a work force and rebuild U.S. Ship Construction starts at the repair yards as it has at every foreign yard we have recently invited into our backyard. Our energy and chemicals move by ATB and there are no government programs that support that effort.

Recent Projects

Amtech recently delivered the ATB Battery Park & MAM 141 from Gulf Marine Repair in Tampa, Florida. A major conversion and life extension project comparing a conversion cost of a new 155,000 BBL Chemical barge and a 6,000 hp tug to rebuilding and converting existing tonnage of the same size and capability. Owners purchased two assets, 18 years of age with coastwise privileges. Both units purchased while in layup, not operational and in a condition requiring major repairs. The project was not only positioned to repair and recover expired Class and Flag certificates, it was developed to convert the ATB to trade in new chemical markets and establish a 15-year life extension to support the investment and business model. New materials, tank coatings, navigational AI, equipment and machinery were introduced and integrated into the existing design to establish the carriage of cargo beyond petroleum products and into chemicals while increasing the performance of the tug & barge with new technology.

The project introduced **Advanced Polymers Coatings Marine Line 784** chosen for application in the barge cargo tanks. A superior, high-performance polymer cargo tank coating, heat cured to a tightly knit, virtually impermeable structure, to provide superior cargo protection for chemical, product, parcel and barge tankers. The lining provides the highest chemical resistance of all coatings and has been referred to as 'liquid stainless steel'. It has a superior resistance to acids, alkalis and solvents with a maximum versatility to carry CPPs, PFADs, Bio Fuels and Methanol. The coating has been applied worldwide in over 600 vessels. Amtech has been trained in coating application and inspection.

What was more important to the coating decision is the fact it is the first application of the Marine Line 784 product in the United States. The detailed requirements of the cargo tank preparation and coating application were completed by Anchor Sandblasting and Painting. The investment in the coating and our confidence in Anchor Sandblasting and Painting was one of the lead decisions in the project.

The decision also exposes our global technology position as the 600 vessels have been completed in foreign locations. Amtech applying one of the first polymer coatings in 2016 in South Korea and now this project being the first completed in the United States. Add the fact that Advanced Polymer Coatings is a U.S. born and bred company and you may understand the maritime problem is not our

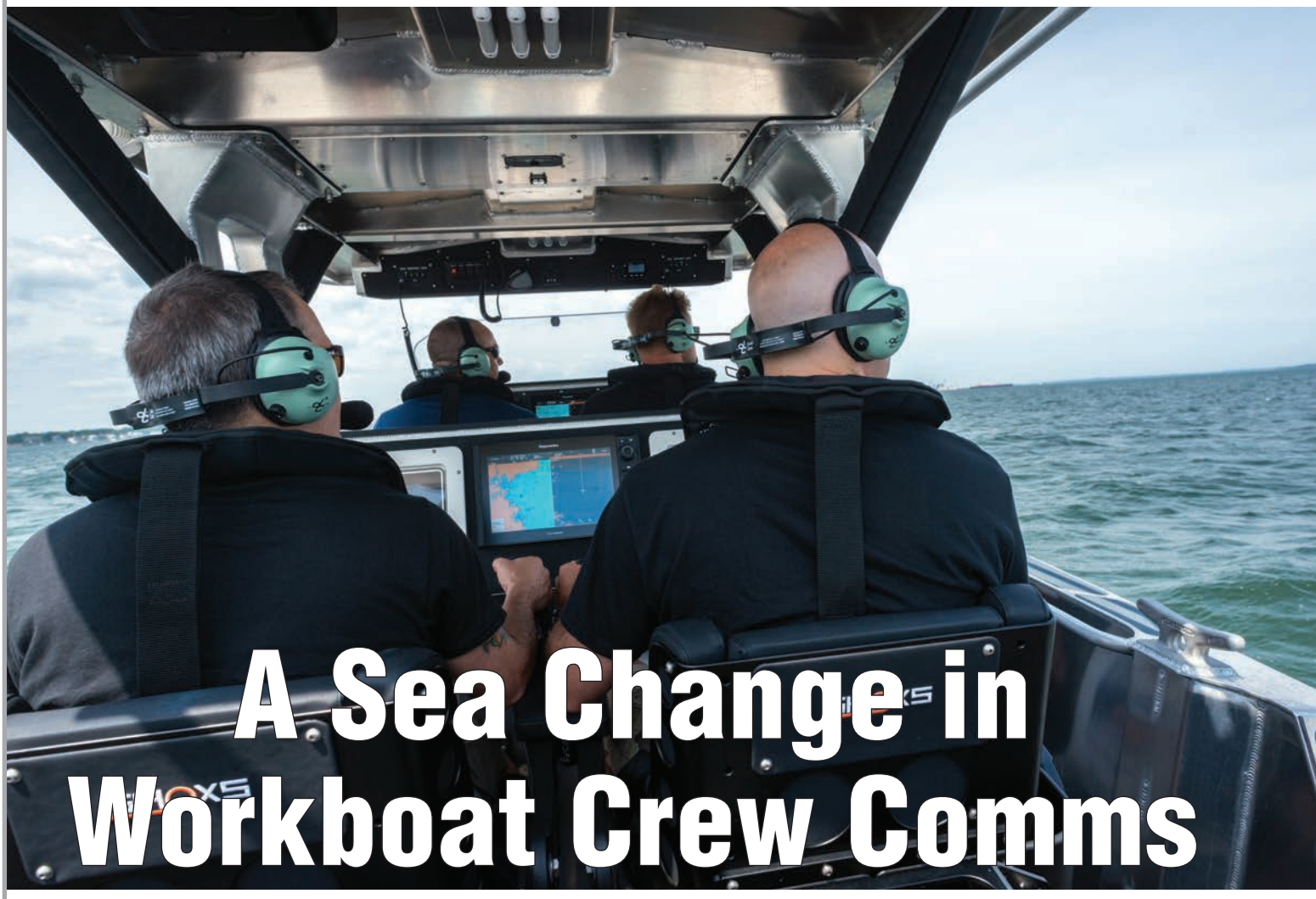
lack of technology nor is it the capability of our commercial or Naval shipyards.

It is the fact that both State and Federal governments never understood the importance of shipping and shipbuilding. And with that never properly funded it through several previous Administrations to match the global capability. Long story short, our ability to compete with China is long gone.

The MAM 141 and Battery Park conversion upgrades continued with a redesigned stainless steel cargo system and pumps from ERL. Another U.S based company providing a technically advanced product. The wheel house and navigation were upgraded to full ECDIS capability and included the installation of the Quartermaster Smart-Mast Maritime Awareness system, providing the bridge resource team real time data, an AI radio frequency interface through Starlink with extended visual camera capability up to 10 miles with a 31x zoom. And yes, the manufacturer is U.S. based also. Main engines, gearboxes, generators, cargo pumps and machinery were all rebuilt. Cabins and Public spaces updated and the highest grade of hull coatings and deck coatings applied. The life extension left no stone unturned including the renewal of over 750,000 pounds of steel. All of which was completed in a U.S. shipyard.

Her first cargo fixed, SIRE completed without comment and the ATB has been turned over to Savage Marine Management as the operator. Let's return to the original concept of the project. New construction cost compared to conversion and life extension, look at the photographs. The Tug and barge were delivered at nearly 1/3rd the cost of the new construction estimate and valued at completion well above the cost to complete the project. Time to fill the gap.

Tech Feature
Crew Communications



A Sea Change in Workboat Crew Comms

By Bob Daigle, Systems Manager, David Clark Company

Crew communications on board workboats in harsh marine environments are subject to a variety of challenges. Background noise from loud engines, shock and vibration pounding through rough water, high wind noise and turbulence at speeds of 55-60 knots, and the highly corrosive nature of the marine environment - can render workboat crew communications all but impossible. Crew members are often reduced to shouting, creating situations where critical communications pertaining to navigational and situational awareness may either be missed or misinterpreted.

Crew Communication System Solutions

David Clark Company has nearly two decades of experience developing communication systems for the marine workboat market. The flagship system for the marine market is the Series 9100 Digital System is transforming the way workboats crews communicate. The system provides clear, hands-free communication for crew members on board high-speed patrol boats for military and law enforcement, fire/rescue craft, offshore service and transport vessels, tug and tow boats, as well as other workboats. System components include a Master Station, User Interfaces

and noise-attenuating headsets working in concert to provide workboat crews with clear communication while enhancing situational awareness, crew safety and helping to ensure mission or operational success. Series 9100 Digital System is the scalable, versatile and simple way to communicate on the water.

System Headsets

Series 9100 Digital Headsets are available in a variety of styles including Over-the-Head and Behind-the-Head models; dual ear, slotted dome and 'hear-through' options for virtually any marine communication application. Behind-the-Head headset styles with low profile headband assembly and ear domes are designed to accommodate a variety of standard issue Coast Guard and military ballistic helmets. Headsets offer advanced comfort features including soft, air-flow head pads and silicone/memory foam ear seals that cradle the head snugly and securely with minimal clamping pressure, keeping workboat crews comfortable during long hours of wear on the water.

Headsets are purpose-built for clear communication, equipped with M-2H advanced microphones with fine-tuned sound pressure level sensing to optimize noise cancellation while enhancing speech clarity. An integrated momentary PTT switch is conveniently located at the microphone bracket of the flex-wire boom. The ergonomically positioned PTT switch is easy to find and utilize in the most stressful conditions on board a vessel and affords simultaneous mic adjustment and transmit capability. Quick-release connectors allow cross compatibility for rapid changeovers between wired and wireless options for mission versatility and flexibility.

Master Station

The **U9100 Master Station** is the heart of the system, providing high performance Ethernet/IP versatility and a modular approach to system interface connectivity to two-way radios and other common ancillaries, as well as existing networks. The Master Station includes one (1) each U9101 Switch Card module, providing out-of-the-box connectivity for up to four Headset Stations or Wireless Gateways. Additional card slots are available for installation of up to three modules (Switch Cards or Radio/Auxiliary Cards) for expanded capabilities.

Intuitive User Interfaces

Operation is simplified with intuitive user interfaces and comfortable, yet durable, noise-attenuating communication headsets. User Interfaces feature *SMARTVOX*, an automatic VOX technology that adapts to background noise in real time, while applying unique DSP algorithms to discern between noise and speech, for instantaneous and effective mic control with no manual adjustments.

Hard-wired to the Master Station, the **U9110 Headset Station** interface provides headset users with software-enabled access to the Digital Intercom System. The U9110 Headset Station features a simple control array for push-button connectivity to any of four channels, and a centrally located PTT switch for fast access (redundant to the headset mic PTT) for ease of voice transmission.

User Interfaces include **Digital Intercom Headset Stations** with simple control array feature software-enabled talk group selection switches with LED indicators and a centrally located PTT switch for fast, effortless access to system functions when seconds count.

The **Wireless Gateway** functions as a relay for audio interface between wireless Belt Stations users, the U9100 Master Station and connected ancillaries. Each unit connects up to four (4) users with a reliable range of up to 300 feet.

Wireless Belt Station provide the headset user with software-enabled access to the Digital Intercom System and is designed to retain the functionality of a wired Headset Station while providing users with the freedom and mobility of a wireless connection.

Simple Operation

Operation is simplified with intuitive user interfaces and comfortable, yet durable, noise-attenuating communication headsets. Headset stations and wireless gateways feature a simple control array with pushbutton talk-group selection switches, LED indicators and centrally located PTT switch for fast, effortless access to system functions.

The 9100 Digital System is purpose-built to withstand the harshest marine environments. System components feature marine-grade, water-tight design – including corrosion resistance, wide-ranging temperature tolerance,

Tech Feature
Crew Communications

high performance shock/vibration absorption, and superior dust and water ingress protection – to ensure reliable communications.

Boat Manufacturers Chime In

David Clark company has established working relationships with several leading high speed craft manufacturers, including SAFE Boats International and Ocean Craft Marine, among others. "At SAFE Boats, we provide products that demand proven performance during dangerous missions in tough conditions and harsh environments. Communication is critical in these conditions. The David Clark Digital System allows operators to communicate internally with one another, but also externally through various radio systems to accomplish the mission," said Rob Goley, Business Development Director for Federal Programs for SAFE Boats International.

When Ocean Craft Marine introduced its 11.5-meter Offshore Interceptor earlier last year, it selected 23 marine companies to collaborate with. For boat crew communications, the Series 9100 Digital system was selected. "The David Clark [Digital] system has been a game-changer. Enhancing crew coordination and overall communication capabilities while improving crew situational awareness and effectiveness, making it a must-have for professional boat operations," said Todd Salus, VP of Operations, Ocean Craft Marine.

www.davidclarkcompany.com

Tech Feature
Thrusters

Thrusters Aid the Advance of Autonomous Nav Systems


ZF Marine

By Keith Henderson, Director of Robosys Automation Ltd.

The demand for "thrusters" on recreational and commercial vessels has increased rapidly in recent years, providing vessels with enhanced capabilities.

Increasing a vessel's manoeuvrability, making its steering more precise, to accurately control course and position offers greater versatility. New markets are opening to take advantage of new horizons with commercial opportunities.

Thruster operation may be manual by the helmsman or part of a Propulsion Management System (PMS). If integrated with an autopilot, its operation relieves the constant hands-on duty for one crew member. Going one step further, using an Autonomous Navigation System (ANS) such as Robosys VOYAGER AI, provides a constant situation awareness monitoring and by merging input from multiple sensors every second to evaluate approaching fixed or moving hazards.

The system's own intelligence allows appropriate control of the vessel's propulsion system, thrusters and steering to be applied to create the required COLREGS compliant vessel movements, without human intervention. An optional module can force the system to automatically take command to steer a path that avoids a collision.

A similar alternative system allows the vessel to be piloted remotely under radio or satellite control, with the ANS ensuring safe passage/return to base even if the remote control communications link is lost.

There are many different types of thrusters on the market, each one with specific attributes for each application, be it for a newbuild or a vessel already in service.

The purpose of the thruster determines the characteristics of the driving motor, be it mechanical, electrical or hydraulic. If it is required for propulsion, moving the vessel from A to B, then the ability to vary the speed is important, while for simple manoeuvring an on/off thruster motor may be adequate. For more precise manoeuvring to maintain station or position, exact control of speed is fundamental, which dictates the motor type and rating expressed in hours rather than minutes.

An example of an azimuth thruster, a ZF AT50 rated at 815kW.

• **Tunnel Thrusters**, are installed within the hull transversely in the bow or stern, singly or in parallel as a pair. A single impeller is more common, but there are designs with two impellers providing greater thrust and also run quieter by reducing cavitation. Some models use a rim drive type of impeller.

• **Azimuth Thrusters** allow full 360-degree rotation of the propeller generating thrust in any horizontal direction, thereby eliminating the need for a rudder. Installed singly or in multiples, they are more commonly used for propulsion rather than manoeuvring. ANS are able to control multiple thruster arrangements in a wide variety of sizes, larger units can propel workboats, tugs, right up to large cruise ships. A special variation, instead of the usual fixed installation, is the portable version comprising propeller, with or without a nozzle, drive shaft and engine. The unit is self-contained and permits self-propulsion of a barge for example. The engine, fuel tank and transmission are all part of the propulsion package, which may also be remotely controlled and operate with an ANS.

• **Retractable Thrusters** that remain protected within the hull yet can be deployed when required, providing additional manoeuvrability.

• **Pumpjets** are a special variety of waterjet thrusters mounted within the hull, are used for propulsion, with their thrust being vectored as required. Their impellers are enclosed and remain protected while vectoring thrust to allow the vessel to manoeuvre in any direction.

A major use of thrusters is for station keeping or dynamic positioning (DP), which controls both heading and position automatically. Dynamic Positioning (DP) is categorised by the IMO into DP1, DP2, and DP3 and prescribes exactly the accuracy, tolerance and reliability of the system. Simplified, non-redundant systems go under the description of station- or position-keeping.

Station keeping systems use a variety of sensors such as GPS, wind speed and direction, and IMU (Inertial Measurement Units). Greater accuracy and reliability can be increased by adding further sensors and positioning them in different locations. Dynamic sensor fusion, provides input to the PMS computer which disseminates the data into separate commands to the individual propulsion system and thrusters to maintain the vessel's position, within prescribed limits.

Commercial Considerations

For all but a few special circumstances, the use of tugs in congested waters, decreased as vessels equipped with thrusters became able to manoeuvre alone. This reduces operat-

Tech Feature
Thrusters

Photo of MT Andaman, [IMO number 9807968] a 30m Indian Navy tug. Converted in 2024 for full uncrewed, remote piloting operation approved by the Indian Register of Shipping.

MDL

Sleipner AS

An example of a 24VDC Sleipner ERV130 retractable thruster.

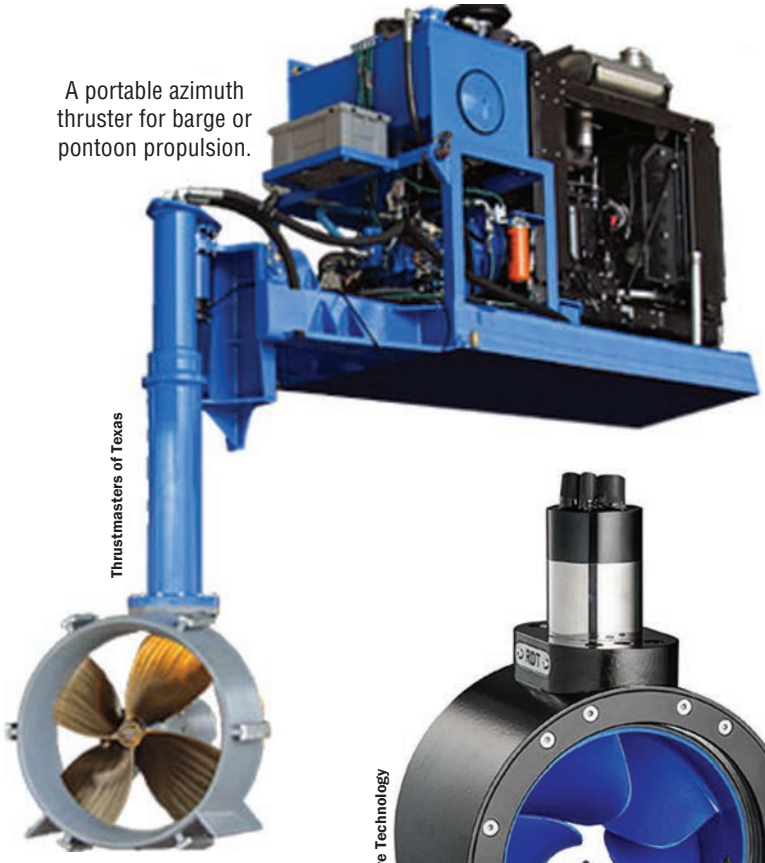
ing costs and opens up areas and waterways that were previously no-go areas. Improved positional accuracy and automated procedures help low crewed and uncrewed vessels carry out movements that would otherwise be difficult or dangerous.

In hydrographical survey markets, specially designed remote piloted unmanned vessels are replacing traditional manned survey vessels, thereby allowing surveyors and crew to be brought ashore. The elimination of onboard accommodation allows the unmanned vessels to be much smaller, and with the option of operating 24/7, with full control being exercised from shore stations. In some instances, control stations switch between two or more countries according to shift requirements while maintaining continuous control.

Movements of vessels on inland waterways are looking ahead for solutions to the future crewing shortages of these vessels, as recruitment to these industries face decline. A convoy system where one captain controls several vessels remotely is only possible with full control of the vessels' movements enabled by thrusters. Some applications use radio controlled azimuth bow thrusters mounted in the lead vessel but controlled from the bridge of a pusher tug. Different parts of the world have different minimum crewing regulations relating to crew numbers based on ship size; in some cases, tug-barge combinations can reduce crew numbers as much as halve crew numbers.

The number of tugs able to be remotely controlled continues to increase, allowing lower manning levels with the captain controlling navigation remotely either ashore or from another vessel, yet with crew remaining onboard to handle the towing procedures.

Harnessing these new opportunities is the ability to add autonomous features to the navigation and power management of a single vessel or fleets of vessels. Automatically maintaining position saves crew hours and reduces fuel consumption. Repetitive tasks can be delegated to an autopilot with autonomous capabilities able to include thruster control when required. Growth in the fleets servicing the offshore windfarm industry is particularly appreciative of thruster equipped vessels where precise movement and station keeping play an essential part



A portable azimuth thruster for barge or pontoon propulsion.

Thrustmasters of Texas

Rim Drive Technology

An example of a single rim-type thruster for bow or stern mounting in a tunnel.

An example of the special Schottel Pumpjet.

Schottel GmbH

of the regular work tasks.

While crewed operations of vessels is obligatory in many operations, there are application that fall into the categories of dull, dirty or dangerous. Perhaps an example of dull operation might be single and double ended ferries plying back and forth between stations. Their essential use of thrusters to aid safe and accurate positioning in most weather conditions greatly assists in maintaining a reliable ferry service.

The use of thruster equipped vessels on city canals to collect garbage from waterside locations as well as clearing up floating rubbish and debris, could fall under the term of dirty applications.

Many military and rescue services are regularly operating in potentially dangerous situations. Robosys recently participated in a US Army exercise with bridge-building vessels, equipping a VOYAGER AI system with full shore remote control to remove all crew from the vessel.

In a different but also dangerous duty, fighting ship fires faces the double danger of the survival of the vessel, and burning cargoes can produce toxic fumes. Being able to manoeuvre a remote controlled uncrewed fire boat or tug with FiFi1-class firefighting systems close-in without endangering crew members enhances its capabilities. The use of thrusters enables accurate positioning of the fire fighting vessel in relation to the burning ship and ensures its position is maintained to counter the thrust of the fire hoses. In 2024 Robosys successfully converted, a 30m Indian Navy tug, equipped with twin ZF azimuth thrusters for full unscrewed, remote piloting operation with full classification approval of the Indian Register of Shipping.

Although not essential for all operations, the addition of thrusters to a vessel's equipment makes docking simpler, regardless of where the command is onboard or remote. In some cases by adding proximity sensors, docking can be automated.

The combination of thrusters and Autonomous Navigation Systems offers improved vessel control contributing to a safer working environment. Reducing crew levels in many applications will continue, while the use of system improvements will ensure increased safety in this market.

C&C Lays Keel for Hybrid Escort Tugs

C&C Marine and Repair held a keel laying ceremony at its Belle Chasse shipyard, marking a milestone in a new series of four advanced hybrid escort tugs being built for Green Tug Towing (GTT). The vessels will support LNG carrier operations at Woodside Energy's Louisiana LNG terminal in Calcasieu Parish.

The GTT series joins a separate series of four hybrid escort tugs already under construction at C&C, bringing the shipyard's active tugboat program to a total of eight vessels. Together, the two programs contribute to Woodside and its contractors having committed more than $1 billion to Louisiana suppliers in support of the Louisiana LNG project.

The keel laying ceremony brought together key stakeholders and industry leaders, including Louisiana Governor Jeff Landry; Louisiana Economic Development Secretary Susan B. Bourgeois; Woodside Executive Vice President and Chief Operating Officer International Daniel Kalms; Green Tug Towing President Thomas Springer; and Tony Cibilich, President and Owner of C&C Marine and Repair.

To commemorate the occasion, Governor Landry welded four specially minted doubloons into the keel — one for each project partner: C&C Marine and Repair, the State of Louisiana, Woodside Energy, and Green Tug Towing. The centuries-old maritime tradition of welding coins into a vessel's keel symbolizes good fortune for the ship and safety for its crew and marks the formal beginning of a vessel's life.

Next-Gen Hybrid Vessels Built for LNG Operations

The four GTT vessels will be built to Robert Allan Ltd.'s RApport 2800H design — one of the most advanced escort tug platforms available — specifically engineered to meet the safety, maneuverability, and environmental requirements of modern LNG terminal operations. The tugs will feature advanced diesel-electric hybrid propulsion systems that deliver meaningful reductions in fuel consumption and emissions during standby, harbor transit, and low-speed maneuvering, alongside high-performance indirect steering forces and bollard pull engineered to safely handle the world's largest LNG carriers.

"These are among the most sophisticated vessels ever built at our shipyard, and our team is ready for it," Cibilich added. "We've spent nearly three decades building the people, the facilities, and the engineering depth to take on programs of this scale. We're proud to build these tugs in Louisiana and to be part of a project that will power America's energy future for decades to come."

C&C Marine and Repair is purpose-built for complex, multi-vessel programs. Founded in 1997 as a 5,000-square-foot repair shop on the Harvey Canal, the company has grown and now spans more than 100 acres in Belle Chasse with 3,200 linear feet of continuous waterfront along the Gulf Intracoastal Waterway and more than 540,000 square feet of fully enclosed fabrication space.

The shipyard sports indoor construction, an onsite team of marine architects, engineers, and welders. A patented robotic blast facility operating 24/7 and an automated panel line round out the production infrastructure, supporting C&C's track record of delivering vessels on time and on budget.

With design work for the GTT series now advancing toward full production, delivery of the vessels is scheduled for 2028 to support Woodside Louisiana LNG's targeted first LNG production in 2029. The tugs will operate under a 20-year services contract to provide LNG carrier berthing, unberthing, escort, standby, and emergency response services.

Products

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2 JA Moody / Phoenix Lighting


3 Palfinger Marine

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4 Kongsberg Maritime


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2. JA Moody, Phoenix Lighting Team

JA Moody, a supplier of flow control products to the U.S. Navy and marine industry, announced a partnership with Phoenix Lighting, a leading manufacturer of heavy-duty LED lighting solutions, marking JA Moody's official expansion into electrical products. JA Moody will offer Phoenix Lighting's rugged, high-performance LED lighting systems designed specifically for demanding marine, shipboard environments.

3. Palfinger PFM 1500

Palfinger Marine launched its new crane PFM 1500. The crane has a maximum outreach of 26.7 meters and a lifting capacity of 3,350 kilograms at full extension, making it a smaller member of the PFM series. The patented P-profile extension boom system allows a wide range of movement and outreach, while providing the strength and stiffness required for demanding lifting tasks. The new design improves the crane's performance by increasing stability while minimizing weight.

4. Kongsberg 500-ton Towing/AHT Winch

Kongsberg Maritime is supplying a winch package featuring a 500-tonne main towing/AHT winch system with three drums, complemented by secondary winches for rope installation, a rope tensioner system, tugger winches, an active heave-compensated working winch, and a complete Towcon X8 control system. The contract introduces two innovative products developed specifically for large anchor handling/mooring installation vessels. The AH100 cranes have increased load capacity and extended reach for larger vessels. They also feature dual arms for lifting and precision handling, with interchangeable tooling to support project-specific tasks. The Shark Jaw, capable of handling chain sizes up to 220mm, incorporates remotely adjustable inserts for enhanced safety and flexibility.

5. Sonardyne Observer

Sonardyne launched Observer, a new monitoring system for real-time integrity management of subsea infrastructure across the offshore energy industry. Observer combines high and low frequency motion and position monitoring, in-built analytics and wireless communications to deliver live insight into how subsea assets are truly behaving.

This means unseen process and environmental challenges, from pipeline expansion and contraction to vortex and flow induced vibration, can be addressed before they become a problem, lowering risk and intervention and costs, while extending asset life. Out the box, it's ROV-deployable, can interface with a wide range of third-party sensors, and can be deployed for up to 10 years at 3,000 m, according to the company.

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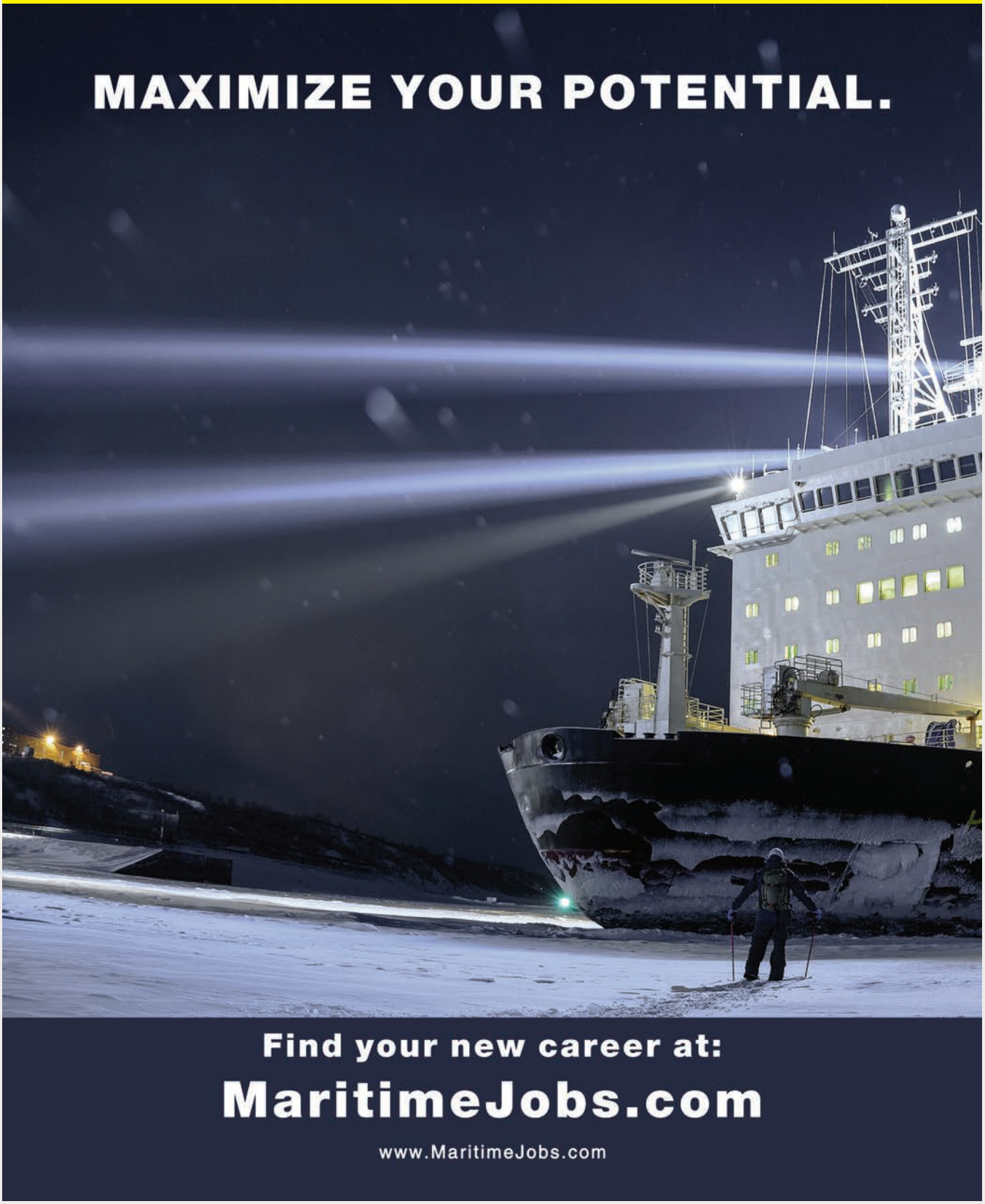

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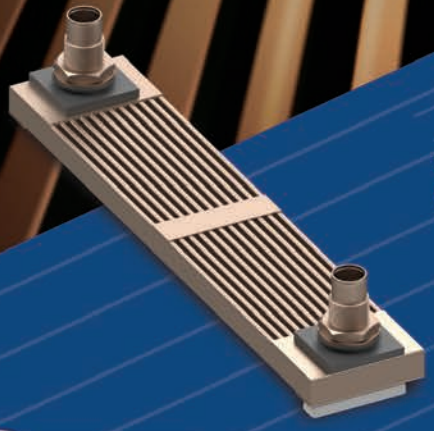

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