PORT OF THE FUTURE

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CEO Kent Britton has **America's Energy Port** firing on all cylinders

USACE
MG Jason E. Kelly discusses inland infrastructure's rebuild

IRPT
Aimee Andres champions inland port & terminal revival

ENERGY EVOLUTION
Inside Gotland's Horizon X, a large hydrogen-ready catamaran

PILOT PROJECT
As ships get bigger, pilots keep maritime commerce flowing

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Images courtesy Houston Pilots

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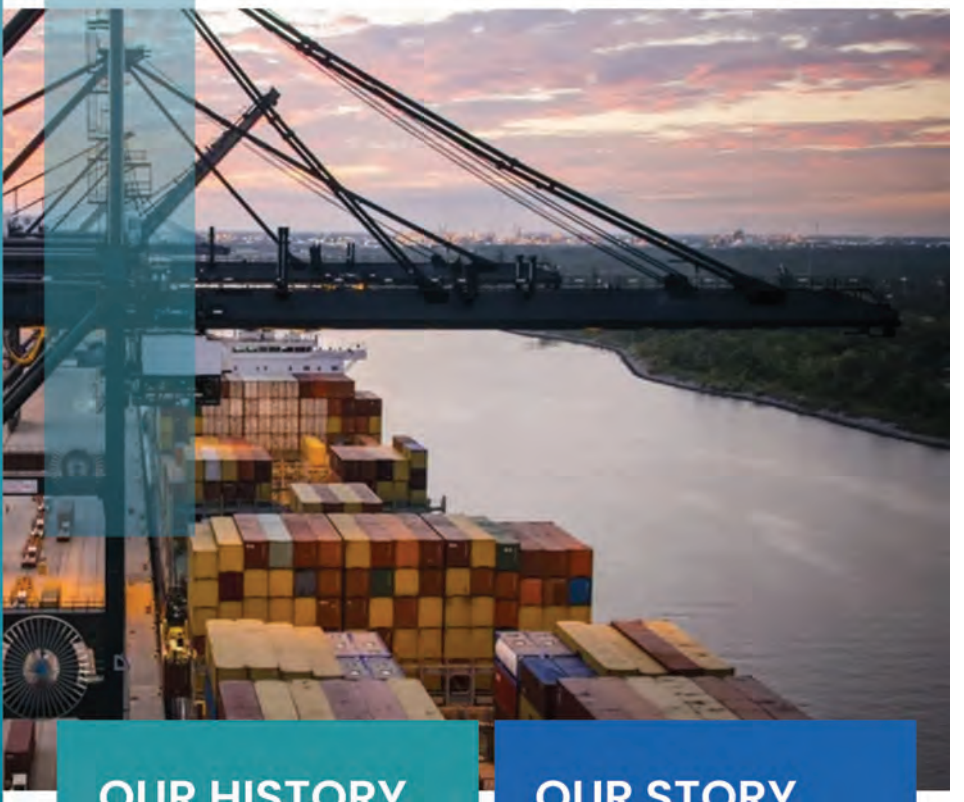

OUR HISTORY

Organized in 1968, the West Gulf Maritime Association (WGMA) embraced within one association steamship owners, operators, agents along with stevedoring, and terminal companies located in Texas. Today the Association has grown to over 200 members throughout the Gulf of Mexico.

OUR STORY

We negotiate and administer various multi-employer collective bargaining agreements with the ILA. The WGMA provides payroll, payroll support services, and processes grievances. In addition, we coordinate the training of longshore workers to promote a safe and efficient working environment.

WHAT WE DO

Service Hub

WGMA administers payroll services for labor. We coordinate and process grievances, training, and other labor related activities.

Communication

We communicate and coordinate industry issues with various governmental entities in a unified voice.

Informational

Our Daily Industry Update Report provides information on news, events, and forums impacting navigational, environmental, and safety concerns in the maritime industry.

Community

We conduct town hall meetings to give members an opportunity to network and hear the latest activities, news, and developments impacting businesses in the maritime industry.

OUR VISION

The WGMA plays a significant role as a partner for progress in the maritime field. By working towards the betterment of our members, partners, and the industry as a whole, we contribute to the advancement and sustainability of maritime operations and services.

OUR MISSION

We serve our members and partners in the maritime industry by fostering a strong, stable and dependable workforce as well as providing crucial information and representation. We are dedicated to the well -being of our members, partners, and the maritime industry as a whole.

west-gulf-maritime-association

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KEVIN CLEMENT
DIRECTOR,
PORT OF THE FUTURE

THE VISION

It began in 2019, with an idea from **Dr. Tony Ambler**, then Dean of the College of Technology at the University of Houston:

Create an annual port conference event that focused on future technology, designed to spur the development of new research, encourage creative solutions, and strengthen the relationship between the maritime industry and institutions of higher education.

In time, the concept dove deeper. Conference topics increasingly addressed the widening gap in operational efficiency between current U.S. ports and ultra-modern ports embracing AI, automation, digitalization and information sharing, robotics and simulations. Consistently the Port of the Future promoted the advances of ports and carriers engaged in curtailing their fossil fuel emissions to reduce and eliminate their carbon footprints. Tracks on "Decarbonization and Alternate Fuels" and "Port Energy and Sustainability" have been a staple since its inception.

The Conference would not be simply a regional event. From the start, it exercised a global reach, touting port development projects, technology break throughs and program initiatives from our neighbors in the western hemisphere, the African continent, Europe, and Asia.

The Port of the Future Conference steadily gained attention for its diverse, dynamic and highly informative programs. Hosting nine tracks, it focuses on the port and maritime industries' most pressing and emerging challenges to promote viable solutions, highlight innovations, and identify best practices. Its format features keynote presentations, case studies, panel discussions, interviews, and technology demonstrations.

The Port of the Future Conference quickly gained acclaim for its premier speakers. Emphasis was placed on recruiting visionaries and thought leaders to introduce new concepts, emerging government programs and initiatives, research breakthroughs and emerging threats. First year headliners included **Admiral James Loy**, former Secretary of Homeland Security and Commandant of the U.S. Coast Guard, and **Alan Bersin**, former "Border Czar" and Commissioner of the U.S. Customs and Border Protection. In the years that followed, featured speakers included CEOs and C-suite executives from ports and the maritime and energy industry worldwide.

Past headliners included acknowledged visionaries **Waleid Gamal El Din**, Chairman of the Suez Canal Economic Zone; shipping and maritime commerce expert **John D. McKown**; General **Stephen Lloyd**, Port and Supply Chain Envoy to the Biden-Harris Administration's Supply Chain Disruptions Task Force; Admiral **Carl Frantz**, Commandant, U.S. Coast Guard, and former Commissioner **Carl Bentzel**, Federal Maritime Commission.

After three years, the paradigm changed. The Port of the Future Conference eliminated "pay to speak" to further encourage the participation of start-ups, think tanks, and research laboratories, so often the catalysts for new concepts and solutions. Speakers now register at no cost.

Intent on creating a critical mass of **50 or more port representatives** assembled in one place, the Port of the Future Conference began offering free representation to a representative from each port. It was an immediate success, with more than 60 port representatives in attendance from ports worldwide over the last four years.

In 2025, the Port of the Future Conference passed from the University of Houston to New Wave Media ...

Port Digitization: Accelerating efficiency and operational awareness

Interviewer: The phrase "digital port" is everywhere. But what does port digitization really mean in 2026?

Vesa: At its core, port digitization means supporting the way ports already operate, making it easier, faster, and more connected. Ports have been running successfully for decades. They have experienced teams, proven procedures, and strong stakeholder relationships. Digitization is not about replacing that experience. It is about giving those teams better tools.

Today, coordination often happens through emails, phone calls, spreadsheets, and separate systems. That approach has worked. But as traffic grows, regulations increase, and stakeholders expect real-time visibility, the volume and speed of information become harder to manage manually.

Digitization connects those processes into one shared platform. Instead of updating multiple systems, information flows automatically. Instead of confirming changes through calls or emails, stakeholders see updates in real time. Airports provide a useful comparison. Pilots still fly planes and ground crews still manage operations, but digital systems connect gate assignments, crew scheduling, and passenger information behind the scenes. Port digitization follows the same principle. It builds on what already works and strengthens it with connected, real-time information.

Interviewer: Many ports have been operating successfully for decades. Why change now?

Vesa: There is no single answer, as each port is different. The ports that have trusted Wärtsilä with their digital transformation programs have had different drivers. Some were focused on reducing vessel turnaround times. Others wanted better real-time decision-making across the port call lifecycle. Some were preparing for traffic growth and capacity optimization. Others were focused on transparency, compliance, cybersecurity, cost control, or sustainability initiatives.

The "why now" varies. However, across the industry we see common themes. Vessel sizes are increasing. Information expectations are higher. Cybersecurity standards are stricter. Boards are asking for better reporting and forecasting. Customers expect real-time updates. Disruptions occur more frequently. All of this increases operational complexity. A modern Port Management Information System acts as the operational backbone to manage that complexity. It connects marine services, berth planning, vessel scheduling, stakeholders, and billing into one coordinated digital environment.

Interviewer: Many ports still rely on spreadsheets, emails, and legacy systems. Are you saying those no longer work?

Vesa: They do work. Many ports operate effectively with them. The real question is whether they are ideal and future ready. We have seen this shift in everyday life. We used to rent movies from Blockbuster. Now we stream them. We used to phone airlines to change flights. Now we use apps. The old methods worked, but digital tools made them more efficient and scalable. Port operations are experiencing a similar evolution.

When information is entered into multiple spreadsheets or shared across email threads, teams spend more time reconciling data and confirming updates. As complexity grows, that coordination requires more effort.

A connected platform eliminates redundant data entry, reduces inconsistencies, and synchronizes updates across departments. Real-time dashboards replace manual reporting. Built-in audit trails strengthen compliance and transparency. It is not about declaring traditional tools obsolete. It is about reducing administrative friction and creating a scalable foundation for growth.

Interviewer: Previously, you mentioned PMIS. What exactly is a PMIS, and how does it support a port's digitization journey?

Vesa: A Port Management Information System, or PMIS, is the central digital platform that connects and manages the operational activities of a port. It brings together vessel scheduling, berth planning, marine services coordination, stakeholder communication, and billing into one integrated environment. Instead of separate systems and manual handoffs between departments, the PMIS acts as a shared source of operational truth.

In practical terms, when a vessel updates its arrival time, that information is reflected across planning, marine services, and reporting automatically. When a berth assignment changes, stakeholders see the update in real time. When services are delivered, billing events are captured accurately and traceably.

For a port beginning its digitization journey, PMIS often becomes the foundation. It creates structure around data, eliminates redundant workflows, improves transparency, and provides leadership with reliable performance insights. Digitization is not achieved through isolated tools. It requires a connected backbone. A PMIS provides that backbone and enables the port to expand into other digital initiatives with confidence.

Interviewer: What changes operationally when a port implements a PMIS?

Vesa: The most noticeable change is operational efficiency and visibility. Instead of information living in different inboxes and systems, there is one shared operational picture. Berth planners, marine services, finance teams, and stakeholders operate from the same validated data.

Changes cascade automatically. A vessel delay updates schedules. Resource allocations adjust. Billing events are captured accurately. Reporting becomes simpler. Over time, ports gain clarity into their own performance. They can measure berth utilization more precisely. They can forecast capacity more confidently. They can respond to disruption with better coordination.

Interviewer: What would you say to a port authority that is unsure whether to begin this journey?

Vesa: I would encourage them to start by asking a few simple questions. Do we have full real-time visibility across the port call lifecycle? Are we confident that data is entered once and shared automatically? Can we measure operational performance without manual consolidation? Is our cybersecurity posture aligned with critical infrastructure expectations?

If there is hesitation around those questions, it may be time to explore digitization. Digitization is not about changing what makes a port successful. It is about strengthening it. In an increasingly connected maritime ecosystem, having a digital backbone is becoming a practical step toward long-term efficiency, transparency, and resilience.

Want to find out more? Contact us at
www.wartsila.com/marine/products/port-optimisation

GREG TRAUTHWEIN
PRESIDENT,
NEW WAVE MEDIA

THE FUTURE

When the opportunity to acquire Port of the Future came up in 2025 I was intrigued, but among the myriad of details to consider there was one stipulation that stood head and shoulders above the rest: I told Kevin Clement at the time: *"If you're in, we're in. If you're not, we're out."*

Welcome to Port of the Future 2026, the first of many to come under the New Wave Media banner. Over the years – 34 years to be exact since I started with New Wave Media in 1992 – we have dabbled in the live event business, but with so much conference content already on the calendar – year in, year out – it was always a matter of deciding 'when and where.' When the opportunity to acquire Port of the Future came up in 2025, the answer was 'in Houston and now'!

In the three plus decades that I've covered the global maritime, offshore energy and subsea markets, it is a vast understatement to say that I've been to many conferences. To be perfectly candid, I find a majority of conferences to be mundane from a content perspective, as the 'pay for play' model is pervasive and many presentations I attend are already 'old news'.

That was not the case with Port of the Future, as Kevin Clement – year in, year out – has connected with port, leadership globally and attracted them to Houston for 2+ days of conference, exhibition and networking, with deep discussions among government, industry and academia regarding the trends that are shaping and reshaping the ports of the world. From a business perspective, this was an ideal fit in the New Wave Media portfolio. New Wave Media is a fourth-generation family-owned New York City-based business-to-business publisher to the global maritime, offshore energy, subsea, ports and logistics markets. Starting with our flagship title Maritime Reporter & Engineering News in 1939, the organization has morphed and evolved over the years, adding breadth and depth to our offering. Whether the topic is maritime security, environmental compliance, shipping efficiency or fuel transition, ports are a big and growing part of the equation for all.

AUDIENCE, AUDIENCE, AUDIENCE

Since 1939, New Wave Media and its family of B2B media have built and maintained the largest, targeted, audited audiences in the maritime, offshore energy, subsea, ports and logistics market, some key statistics including:

- 1,625,082 – Average monthly network pageviews
- 137,618 – Average monthly magazine circulation
- 91,335 – App Downloads

In print, online, via eNews, video channels, podcasts, social media, industry analytical reports and consultation, micro conference events and now full-scale conference and exhibition courtesy Port of the Future, our singular effort for more than 85 years has been to build and maintain the largest collective target audience that make or sway purchasing decisions across the individual markets we serve.

We have big plans for the event's expansion, but more on that later. Until then, I wish you a warm welcome to Port of the Future 2026.

We've built the conference program, the exhibition, the social events and the local port tour with an eye on providing each of you with the opportunity to connect, learn and to envision and create solutions that will drive port development and efficiency for the current and next generation.

Photo courtesy of Lincoln Electric

Electrification at Ports:
From Early Pilots to Operational Performance

Electrification is advancing rapidly across U.S. ports, and it's no longer a pilot initiative. It has become a competitive strategy. As terminal tractors, yard dogs, reach stackers, and forklifts transition to electric drivetrains, ports are discovering that cleaner operations deliver hard operational benefits: healthier air for fence-line communities, quieter yards that support safety and retention, and clear signals to tenants and carriers that the terminal is future-ready.

The economics are equally compelling. Electricity's relative price stability reduces reliance on volatile diesel markets, while electric drivetrains lower maintenance costs through fewer moving parts, reduced brake wear, and minimal routine servicing. When combined with load-management software to control peaks, the total cost of ownership improves significantly, and capital ports can redeploy toward berth productivity, automation, and workforce development.

Winning the transition, however, requires ports to think differently about energy infrastructure. The most advanced ports are shifting from projects to platforms, building interoperable, upgradable charging systems that support multiple OEMs, leverage open protocols, enable remote diagnostics, and anticipate future standards for heavy drayage and high-power yard equipment.

Ports are also evolving from static infrastructure to flexible power. Yard layouts change, seasonal surges impact dwell times, and electrified fleets rarely behave in predictable patterns early on. Mobile DC fast charging has emerged as a powerful bridge solution: deployable in days, movable as operations evolve, and capable of collecting real duty-cycle data before committing to permanent installations.

Finally, leaders are shifting from charging hardware to full energy management. Software now plays a decisive role in orchestrating charging sessions, staggering starts, integrating storage or solar canopies, and shaving demand peaks. Early utility coordination, supported with real-world telematics and charger logs, helps ports right-size feeders, transformers, and interconnection timelines, avoiding costly redesigns and unnecessary delays.

In this environment, hardware reliability becomes a strategic advantage. Ports are among the harshest industrial environments in the country, with saltwater exposure, wind, humidity, vibration, and abrasive particulates constantly threatening equipment uptime. The Velion® 50 kW DC fast charger is engineered specifically for these conditions. Built in the United States and Build America, Buy America compliant with more than 70% domestic content, it features epoxy coated circuit boards, weather hardened enclosures, integrated smart diagnostics, and a three year warranty backed by Lincoln Electric's nationwide industrial service network. Velion's rapid-deployment design helps ports activate charging capacity quickly while long-term infrastructure develops.

Electrification is not about compliance. It's about operational resilience, throughput, and competitiveness. Ports that build adaptable energy platforms and treat charging as a strategic asset will set the performance benchmarks others chase.

Author Lincoln Electric

INTERVIEW

MAJOR GENERAL JASON E. KELLY

By Greg Trauthwein

U.S. ARMY CORPS OF ENGINEERS:
MODERNIZING AMERICA'S INLAND WATERWAYS

*For **Major General Jason E. Kelly**, rebuilding America's inland waterway infrastructure is not an abstract policy objective. It is a mission grounded in experience, urgency and national consequence.*

As Deputy Commanding General for Civil and Emergency Operations at the U.S. Army Corps of Engineers (USACE), Kelly sits at the center of the federal government's effort to modernize locks, dams and navigation channels that underpin the U.S. economy. His portfolio touches virtually every state and territory — and nearly every American consumer.

"This is one of America's great strategic advantages," Kelly says of the inland waterway system. "But it's not something we can take for granted anymore."

FROM COMBAT ARMS TO CIVIL WORKS

Kelly did not begin his Army career expecting to oversee ecosystem restoration, flood risk management and navigation infrastructure. For more than two decades, he served as a combat arms officer. When he was selected to command USACE's Norfolk District as a colonel, he recalls checking the assignment list twice. "Up until the day I took the colors, I wasn't sure I could get as excited about aquatic ecosystem restoration, navigation and flood risk management as I did about preparing troops for combat," he says. "But I absolutely love it."

That experience reshaped the trajectory of his career and ultimately led to his current role overseeing the Corps' Civil Works mission — a mission that includes stewardship of the nation's inland waterways system.

The work is also personal. Raised in Flint, Michigan, Kelly saw firsthand what happens when infrastructure fails a community.

"Seeing what my hometown endured underscored how vital reliable infrastructure is," he says. "It taught me the respect we owe the engineers and technicians who keep these systems safe."

THE QUIET GIANT OF U.S. COMMERCE

Few organizations touch as much of the U.S. economy as USACE. The Corps spans eight divisions and 44 districts, covering every state and territory. Its 250-year legacy includes opening navigable rivers to commerce and building infrastructure that enabled American industrial growth.

Today, the Corps maintains: 12,000 miles of inland waterways; 13,000 miles of Intracoastal waterways; 700 dams and 13,500 miles of levees; and the largest hydropower portfolio in the U.S. USACE-supported waterways move roughly 2.3 billion tons of cargo annually. Nearly half of all U.S. consumer goods and 70% of imported oil rely on navigation channels maintained by the Corps. An estimated 98% of overseas trade transits waterways connected to Corps infrastructure.

Barges moving along these routes reduce highway congestion, lower emissions and provide one of the most cost-efficient freight modes in the world.

Simply put, the inland waterway system is foundational to U.S. economic competitiveness and energy security.

AN AGING SYSTEM ... "IT'S NOT GOOD"

Kelly is candid about the condition of that system. "This question turns my smile upside down," he says. "It's not good."

According to the latest industry assessments, inland waterways earn a C- and dams a D+ grade. The statistics tell the story:

- 80% of locks exceed their 50-year design life
- Seven in 10 U.S. dams are more than 50 years old
- Multi-day closures are increasing
- Unscheduled failures are rising in frequency and severity

"Lack of investment over time has consequences," Kelly says. "These aging systems lead to delays, higher transportation costs and operational risk we can no longer ignore."

A single lock failure can halt commerce across multiple states, disrupting agricultural exports, energy shipments and industrial supply chains. In a global environment where supply chain resilience has become synonymous with national security, that risk is magnified. "My tenure," Kelly says plainly, "will be defined by how we take this challenge on."

“Eighty percent of our locks are 50 years old,” he says. “My vision is a reliable and available system. That will only happen if we rehab what we have, maintain what we have, and invest in what we have.”

Major General Jason E. Kelly,
Deputy Commanding General for Civil and Emergency Operations, USACE

Image courtesy USACE

FUNDING MOMENTUM — BUT GAPS REMAIN

Recent years have brought significant federal investment into infrastructure, including inland waterways. But Kelly stresses that the backlog remains substantial. USACE tracks key performance indicators across the system — mechanical failures, 24-hour delays, weeklong closures. The most concerning trend is the increase in multi-day disruptions. Systemwide availability is currently around 95%. Kelly’s target is 100%.

“Our legislators are visiting sites and seeing the condition firsthand,” he says. “My job is to convey, through data, the risk we’re sitting on. When they see the data, the investment case becomes clear.” Workforce capacity — a challenge across many federal agencies — has not slowed execution in critical areas, he notes. The Corps continues hiring in navigation engineering, project management and operations. “I’ve seen no impacts that prevent us from delivering,” Kelly emphasizes.

Funding alone will not solve the problem. Kelly is equally focused on modernization. “We have to modernize the system for this day,” he says, “and set conditions for a more favorable future.” Among the Corps’ key initiatives:

- **Lock Control Modernization:** Many lock control systems date back decades. USACE is integrating digital dashboards, automation upgrades and modern controls to reduce maintenance costs and improve reliability. “I need to take advantage of today’s technology to buy down operating and maintenance costs,” Kelly says.
- **Digital Twins:** The Corps increasingly uses digital replicas of physical infrastructure to simulate stress, predict failure points and intervene before breakdowns occur. “This helps us go faster and intervene earlier,” Kelly notes.
- **Advanced Materials:** Fiber-reinforced polymers and other new materials promise longer life cycles and lower maintenance demands — critical for structures already 70 years old.
- **Asset Management Analytics:** Sophisticated data tools help prioritize limited dollars toward the highest-risk assets, increasing transparency and accountability. On the coastal side, the Corps is advancing deep-draft channel improvements to accommodate larger vessels. “If we’re going to remain competitive globally, we must advance deep-draft projects,” Kelly says.

DELIVERING FASTER, SMARTER PROJECTS

One of Kelly’s concerns is project delivery timelines that have stretched from roughly a decade to 20 years or more. To counter that trend, the Corps is focusing on three imperatives: Get the engineering right; Get the project management right; and Get the team right. USACE is pursuing a more integrated model with industry partners and non-federal sponsors, emphasizing collaboration and shared accountability.

“It is the collective,” Kelly says, “that is going to allow us to continue to deliver for the nation.”

Seven major lock and dam projects are currently under construction, with several more in design. They represent a generational modernization push.

Kelly’s long-term vision is straightforward: a reliable, available and resilient inland waterway system. “Eighty percent of our locks are 50 years old,” he says. “My vision is a system that is reliable and available. That only happens if we rehab what we have, maintain what we have and invest in what we have.” For maritime stakeholders — towboat operators, barge lines, port authorities and shippers — the stakes are obvious. For policymakers, the connection to national power may be less visible but no less critical. “These waterways are why we are a superpower,” Kelly says. “But we must invest today. Not tomorrow.” The inland waterway system is one of America’s quiet strategic advantages. Whether it remains one will depend on decisions made in this decade. Major General Jason Kelly is determined to ensure it does.

By Clayton L. Diamond

AS SHIPS GET BIGGER [AND PORTS GET CORRESPONDINGLY SMALLER] PILOTS KEEP MARITIME COMMERCE FLOWING SAFELY AND EFFICIENTLY

Photo: Houston Pilots

Over 95% of large ocean-going vessels moving in U.S. waterways are under the direction and control of a pilot that is a member of the American Pilots' Association (APA). The enormous increase in vessel sizes – as much as five times bigger than just twenty years ago – without corresponding expansions of waterways has made the already difficult work of these pilots even more challenging.

APA-member pilots are generally the only U.S. citizen aboard foreign ships moving in the fragile bays, ports, rivers, and lakes that are the lifeline of this country. The pilot boards the ship and takes charge of its navigation and has a duty to prevent it from engaging in unsafe operations. In the U.S., a pilot's overriding obligation is to serve the public interest by protecting the marine environment and port infrastructure while keeping maritime commerce flowing efficiently. The pilot is not a member of the ship's crew. In fact, the U.S. pilotage system of laws and regulations looks to ensure the pilot is insulated from the economic pressures on the shipowner and independent of control by the ship's master.

Every time a pilot boards a ship, she or he knows that a moment's inattention, complacency, wrong decision, or simple mistake could lead to a catastrophic vessel casualty with great harm to the marine environment, hundreds of millions of dollars in damages, and/or loss of life. Coupled with the physical dangers pilots face (every year pilots around the world are killed or injured on the job), few professions have presented such risks and demanded such skill in the normal course of activities.

Piloting has always been an extremely difficult profession, requiring a high skill level, but it is becoming even more difficult as the global shipping industry opts for larger vessels that dramatically outpace dredging of navigational channels and upgrades to other port infrastructure. *In other words, ships are getting larger and ports are getting correspondingly smaller.* Pilots are now regularly asked to assume the risks associated with maneuvering massive deep draft ships through winding,

narrow, and congested waterways designed decades ago for much smaller vessels.

The National Transportation Safety Board (NTSB), in its report on the containership Dali's allision with the Francis Scott Key Bridge, confirmed that pilots are facing enhanced challenges due to ship growth continually outstripping port improvements. In its report, NTSB concluded that increasingly larger commercial ships "pose increased risks and challenges to maritime safety due to their reduced maneuverability in, and in close proximity to, port and waterway infrastructure that was not designed to accommodate vessels of such size." This NTSB report shows that the difficulties associated with increased ship sizes in "shrinking" ports are not theoretical. These challenges are here and they are now. Following are just some challenges pilots are facing in this new reality:

- **Extremely Limited Maneuvering Space:** Larger vessels mean less room for error in channels and turning basins, reducing the margin for safe navigation.

- **Reduced Under-Keel Clearance (UKC):** As ships get larger and carry more cargo they go deeper, which increases the risk of grounding, especially in ports with limited dredging capabilities.

- **Increased Stopping Distances & Inertia:** Larger, heavier ships require much greater distances to stop or turn, making speed control and precision maneuvering critical.

- **Visibility Limitations:** High-stacked containers on Ultra Large Container Ships and can significantly limit a pilot's view from the bridge, adding to the difficulty of a pilotage maneuver.

- **Environmental Factors:** High winds and strong currents have a greater effect on larger ships with ever expanding underwater hull masses and "sail areas," increasing maneuvering difficulty in tight channels and during mooring.

- **Infrastructure Constraints:** Many ports, designed for smaller ships, lack the necessary berth depth, pier length, crane size, and turning basins, leading to higher operational pressures.

- **Operational Risks:** Increased ship sizes make any potential accident (grounding, collision or allision) far more severe, with greater environmental and financial consequences.

While many ports are investing in dredging and infrastructure upgrades, most maritime experts predict the pace of ship growth will continue to exceed these upgrade efforts. This means that the U.S. marine transportation system and supply chain upon which our economy depends will continue to rely heavily on pilots and their finely honed skills to bridge the gap between the realities of growing ships and near-static ports. Fortunately, APA-member pilots and our compulsory pilotage systems are up to the challenge.

Pilots licensed by the twenty-four coastal states and Puerto Rico, and U.S.-registered Great Lakes pilots, are resilient, specialized, independent, safety-driven, rigorously regulated, and fully capable of mitigating the enhanced risks associated with large ships moving in confined hazardous waterways. Compulsory pilotage is one of the most effective ways for governments to protect the marine environment while facilitating the safe and efficient movement of maritime commerce because, unlike other maritime safety regulations which merely direct a ship to take or not take certain actions, pilotage regulations place on the bridge of a ship a highly trained pilot to ensure the ship takes appropriate action. This pilot possesses unmatched local knowledge; is an expert ship-handler; leverages emerging navigation technologies; is free to exercise informed independent judgement; and has the sole objective of protecting the public interest.

Despite increased risks posed by larger ships calling at U.S. ports that have not kept pace with ship growth, APA-member pilots will continue to step up and perform their vital duties. These pilots will continue to act in the public interest, uphold their traditionally high standards, and maintain the independent, professional, and specialized knowledge that is crucial for the safe, environmentally responsible, and efficient movement of maritime commerce.

About the Author

Clay Diamond is the Executive Director-General Counsel for the American Pilots' Association (APA). Prior to that, he served 13 years as APA's Deputy Director-Associate General Counsel. A 1989 graduate of the Coast Guard Academy, he also earned a Master's Degree from Rensselaer Polytechnic Institute and a Juris Doctor from Case Western Reserve University School of Law. As General Counsel, he represents pilots and the piloting profession before Congress, federal agencies, and State and local legislative and administrative bodies. He also advises pilot groups and pilotage authorities on operations, practices, business structures, and oversight of pilots and pilotage systems.

The Architecture of Certainty:
Moving Beyond Automation to Awareness

In a global economy where **90% of trade** moves through ports, the defining challenge is no longer a lack of data, but the **friction of fragmentation**. Most terminals operate as a "Digital Orchestra" playing from different sheets of music, forcing leadership to manage by "best-guesses". **A&I Strategic Solutions** provides the specialized analytics consultancy and proven technology to resolve this crisis, bridging the gap between **signals and steel** to achieve true **operational awareness**.

The Strategic Gap: Ports are the invisible heartbeat of global trade, pumping the food, medicine, and energy that sustain our world. The stakes are immense: a major U.S. port shutdown can cost the economy up to **$5 billion every single day**.

While modern terminals generate massive amounts of data, they often suffer from what industry veterans call being **"Data rich, but insights poor"**. When your Terminal Operating System (TOS) falls out of sync with crane software or gate logs, it creates an operational chokehold. This isn't just a technical glitch; it is a systemic bottleneck that triggers panic across the entire partner supply chain, turning a local delay into a global disruption.

Consultancy for the Real World: We are not just software providers; we are specialized analytics consultants who resolve "impossible" integrations. We bridge the gap between legacy iron and modern digital systems through **universal normalization**, translating proprietary OEM "data exhaust" into a single, synchronized stream of truth. Building **our solution ForgeTrack**, we learned that **awareness** for ports, **not automation**, is the defining capability of the next decade.

The ForgeTrack Methodology: Orchestrating the Future of Trade

I. The Implementation: The RICE Framework

The Register, Inspect, Comply, and Enforce (RICE) framework is a four-stage operational model, designed to operationalize port technology by establishing a unified data schema and enabling real-time edge monitoring. It serves as a roadmap to transition terminal operations from reactive "firefighting" to proactive control through the use of AI-driven anomaly detection and predictive analytics.

This specific methodology emerged from a shift in how government agencies (like the FDA and USDA) and industry

Photo Credit: A&I Strategic Solutions

organizations began to manage large-scale compliance several years ago. We adapted this proven safety model for the maritime sector because both industries share a common "strategic gap"; they are **data rich but insights poor**. Just as a food processor needs to know the exact temperature history of a shipment to ensure safety, a port needs the exact "signal history" of its cranes and gates to ensure intermodal flow.

II. The Journey: The Port Modernization Maturity Model

Our roadmap is a three-tiered journey designed to build a resilient, connected intermodal chain without the "rip and replace" cost of new hardware.

Tier 1: Universal Normalization (The Foundation)

The goal is to eliminate the **"Human Translator" bottleneck**. By automating data reconciliation across legacy and modern silos, we allow leadership to stop being data clerks and start being **strategic pilots**. Every partner, whether it's a vessel, yard, gate, rail, and/or truck, finally looks at the same "sheet of music".

Tier 2: Edge-Based Operational Intelligence (The Action)

We move beyond passive viewing to real-time alerting at the edge where the work happens.

- **Smarter Reefers:** Detect compressor failures via electrical signals before spoilage occurs.
- **Gate & Congestion Intel:** Sync gate OCR with yard telematics for efficient "Move Recommendations".
- **Active Hazmat Defense:** Proximity alerts move safety from a paper policy to an active, edge-based defense.

Tier 3: Intermodal Autonomy & Awareness (The Future)

Achieve **"Cognitive Autonomy"** where the port anticipates disruptions before they happen.

- **Predictive Health:** Schedule "surgical" maintenance during lulls in traffic to ensure 100% equipment readiness.
- **Partner Synchronization:** Automatically recalibrate pickup windows when vessel arrival times shift, eliminating "Intermodal Blindness".
- **Berth-to-Rail Sync:** Map high-priority containers directly to the railhead before they even dock, drastically reducing yard dwell time.

Any Questions?

Please reach out to **info@forgetrack.com** or visit our website at **aistrategicsolutions.com**

Photo Credit: A&J Strategic Solutions

By William Doyle

Photo: Manson Construction

AMERICA'S PORTS, HARBORS, AND WATERWAYS: DREDGING, RESOLVE AND THE WILL TO BUILD

America's maritime infrastructure is measured in draft depth, vessel clearance, sediment management, and days available to dredge. If the United States is serious about competing in a century defined by supply chains, energy exports, and sealift readiness, then ports, harbors, and waterways must move from being in the background to becoming part of the national strategy.

Across the Gulf Coast and beyond, the evidence is clear: when Congress, the Administration, industry, and the U.S. Army Corps of Engineers align, progress follows.

Recently, the Dredging Contractors of America received a warm bipartisan reception in the House of Representatives as members submitted a Sense of Congress draft resolution through the WRDA 2026 portal to expand dredge windows. That proposal is grounded in a simple principle—modern science and adaptive management should guide dredging schedules, not outdated assumptions. Restricting activity in major gateways to narrowly defined windows that limit work to roughly one-third of the year constrains commerce, increases costs, and undermines reliability. Expanding dredge windows responsibly is not deregulation; it is disciplined modernization.

Pictured above: On January 27, 2026, Manson Construction's newest hopper dredge, the FREDERICK PAUP, departed the Seatrium AmFELS shipyard in Brownsville, Texas, bound for Mobile, Alabama. It is the largest self-propelled hopper dredge ever constructed in the U.S.

That same theme carried into the Pentagon earlier this year, when several dredging company owners and chief executives joined me for a meeting with Assistant Secretary of the Army for Civil Works Adam Telle. His message was direct: the United States is engaged in a 21st-century competition with China for economic leadership, and infrastructure is central to that competition. He emphasized a focus on building infrastructure—not paperwork—and expressed full support for using real science and adaptive tools to increase the number of workable dredging days where appropriate.

Mr. Telle reminded us that next year marks the 100th anniversary of the Great Mississippi Flood of 1927. That event reshaped federal flood control policy and reinforced a national understanding that water management requires foresight and engineering discipline. The dredging industry stands ready to support commemorative events honoring that history while reinforcing a simple truth: resilience is built, not assumed.

Investment is already reflecting that mindset. On January 27, 2026, Manson Construction's newest hopper dredge, the FREDERICK PAUP, departed the Seatrium AmFELS shipyard in Brownsville, Texas, bound for Mobile, Alabama. It is the largest self-propelled hopper dredge ever constructed in the United States and represents Manson's largest single investment since its founding in 1905.

At 420 feet in length with a hopper capacity exceeding 15,150 cubic yards, powered by 25,000 horsepower and equipped with dynamic positioning, advanced dredging systems, Tier 4 diesel-electric engines, and optimized hull design, the vessel reflects next-generation American engineering and shipbuilding. It transitioned directly from delivery into U.S. Army Corps of Engineers Mobile District work, performing essential maintenance dredging that keeps deep-draft navigation reliable.

That is what maritime strategy looks like in practice: American shipyards building Jones Act vessels, crewed by American mariners, maintaining federally authorized channels that move agricultural exports, LNG cargoes, containerized freight, and military sealift assets.

At the same time, the Gulf Coast is advancing the national conversation around beneficial use of dredged material. Alabama's recent legislative activity addressing sediment placement practices in Mobile Bay highlights the increasing scrutiny and engagement surrounding environmental stewardship. Federal law already directs that not less than 70 percent of suitable dredged material be used beneficially where feasible, encouraging collaboration between the Corps and local stakeholders to align navigation and restoration objectives. Navigation and environmental performance are not opposing goals; they are increasingly integrated disciplines.

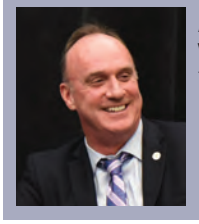
Dredging policy is not a narrow industry issue. It is foundational to port competitiveness, shipyard workload stability, energy security, coastal resilience, and national defense readiness.

The Gulf Coast provides a blueprint. Congress is engaging through WRDA. The Administration is emphasizing infrastructure delivery. Industry is investing in modern, U.S.-built vessels. States are refining sediment management policies. The Corps remains the operational backbone.

What is required now is resolve. Resolve to modernize dredge windows using data. Resolve to continue building Jones Act vessels in American yards. Resolve to align environmental policy with navigation reliability. And resolve to recognize that ports and waterways are not peripheral but rather, they are strategic assets in a competitive global economy.

America has built its strength on maritime commerce for more than two centuries. The question is not whether we can build again. The question is whether we will choose to do so with urgency and unity.

The path forward is clear. Dredging is foundational. Infrastructure is strategy. The will to build must remain national.



About the Author

William P. Doyle is CEO of the Dredging Contractors of America.

All images courtesy of Ricardo

Is your port's business model fit for the future?

What Panama and Caribbean sustainable shipping corridors can teach American ports

The transition to a low-carbon, multi-fuel future is under way and those who are not already considering how to adapt their ports and operations risk being left behind or overlooked for future opportunities.

To adapt, ports must start forecasting demand across electricity, hydrogen and e-fuels, accommodate first-of-a-kind alternative fuel vessels and build resilience into systems exposed to climate risk.

As critical trade gateways introduce low-carbon measures for vessel priority and their own reliability – such as the Panama Canal's NetZero slot – early investment in alternative fuel infrastructure and scalable shore power becomes necessary rather than optional. Ports must transcend business-as-usual thinking, accept the need to move beyond familiar fossil fuels and increase their electrical-supply capacity.

While this can seem daunting, you can get a glimpse of the port of the future by looking at sustainable shipping corridor initiatives already under way, for example in Panama and the Caribbean. But how can ports across the continental Americas use signals from Panama, the Caribbean and beyond to structure a credible total energy transition?

1. Assess the future market by positioning the port to attract first movers

First-mover vessel operators introducing sustainable shipping initiatives – including zero/low-carbon powered vessels – need ports able to accommodate them. Ports that position themselves to attract this new business will gain short-term commercial opportunity and long-term customer contracts/partnerships. Monitoring initiatives such as sustainable shipping corridors and hydrogen fuel investment is key.

Ricardo is a leader in sustainable shipping corridors

Ricardo has helped many ports and shipping lines assess the impact of sustainable shipping initiatives: short-sea opportunities in European waters as well as transatlantic and Caribbean ventures. Among others, we are assessing the feasibility of adopting lower GHG fuels in the corridor between Panama and Spain, and in the Caribbean. This, coupled with Panama's additional incentives through its NetZero Slot for low-carbon vessels to use the Canal, clearly demonstrates the shift towards decarbonised vessels that is coming to the Americas. Emissions performance is no longer simply a future compliance issue – it is a source of commercial advantage through guaranteed transit and reduced schedule risk.

2. Quantify demand and evaluate supply constraints in port

Assessing this prospective market, and its potential electrical and alternative-fuel demands, helps ports plan how best to attract and cater for those vessel operators. It will be particularly important to quantify the increasing demand for electricity in ports, from both the aggregation of demand from vessels – plugging into shore-power and recharging batteries in hybrid or 100% electric ships – and the increasing electrification of port machinery, drayage and other vehicles. Having established the projected temporal profile of energy demand, the port can assess whether its existing plans for energy systems will be sufficient. If shore power is not reliably available, vessel operators that rely on it for their GHG compliance strategy and/or delivering low GHG emissions for their customers will look elsewhere.

3. Optimise port and terminal energy system investments

Electrical grid upgrades are expensive investments. Optimising these investments is crucial to make the commercial business case work. Peak-shaving opportunities can be created by deploying renewables, using battery energy-storage systems and even hydrogen to buffer potentially high short-term peak demands. Optimisation can also include the recharging strategies of port machinery.

Balancing investment and opportunity

By linking energy planning to cost, resilience and competitiveness, we provide port and terminal operators with a clear framework for turning complex energy choices into robust, commercially defensible decisions.

4. Accommodating alternative fuels in ports

The diversification of fuels in ports means the diversification of hazards. While ports may already handle these fuels as chemicals, having them in vessels – with the consequent need for bunkering – brings new safety challenges. Safety is a priority for ports, which will need to update emergency planning and procedures, anticipating widened hazardous areas and providing additional firefighting systems and spill-response frameworks.

5. Check resiliency in the face of climate risk

Delays caused by droughts, hurricanes and other weather-related phenomena affect arrival patterns and peak demand while threatening the structural integrity of assets. Early modelling of weather dynamics helps infrastructure development remain profitable and reliable, maximising return on investment and increasing port resilience and hurricane-ready energy assets that protect critical services.

For ports, the strategic imperative is clear: long term commercial viability depends on anticipating future demand, deploying flexible and upgradeable energy infrastructure, and sequencing investment using lifecycle-based economics rather than short-term fuel bets.

Move early, and ports will help shape the technical and commercial conditions that determine future trade flows, anchoring relevance and revenue in a decarbonising global system.

Ports must adapt, just not react, to climate change

Understand how proactive climate adaptation protects assets, reduces disruption and strengthens competitiveness through smarter investment, greater resilience and long-term commercial confidence.

About the Author

Tim Scarbrough is Ricardo's Director of Maritime. An expert in zero/low-carbon marine fuels, he has led highly respected work on energy-transition pathways – for the International Maritime Organization among others – and the green shipping corridors that Ricardo supports. He helps ports with their energy transitions and in accommodating the transitions of incoming vessels.

Visit **ricardo.com/potf** for case studies and industry insights for ports

By Greg Trauthwein

BUILT ON THE RIVERS
AIMEE ANDRES AND THE EXPANDING ROLE OF AMERICA'S INLAND PORTS

*For **Aimee Andres**, the nation's inland rivers are not an abstract transportation network or a policy talking point. They are personal. Growing up, she spent her formative years around ports, terminals and railroads, watching firsthand how freight moved and how quietly essential inland infrastructure is to the country's economic engine. That upbringing ultimately led her to a role she has now held for more than a decade: **Executive Director of Inland Rivers, Ports & Terminals (IRPT)**. Over the past 13 years, Andres has helped transform IRPT from a relatively small, inland-focused association into a national advocate for freight mobility, infrastructure investment and supply chain resilience.*

"My dad was a terminal operator, then a port engineer, then a port director," Andres said. "Transportation literally runs through my blood."

That early exposure made a lasting impression. As an adult, when it came time to choose a career path, Andres knew ports and terminals were where she wanted to be. When she stepped into the executive director role at IRPT, she quickly recognized a core challenge shared by many inland ports: extremely small staffs carrying enormous responsibility.

"These facilities might have one or two people managing legislative affairs, HR, business development, tenant relations — you name it," she said. "Yet the impact they have on their communities and shippers is enormous."

Helping those lean organizations gain access to resources, advocacy and business development support has been central to IRPT's evolution under her leadership.

IRPT TODAY

From its headquarters in St. Louis, IRPT now operates with a small but geographically distributed team. Its membership has grown to roughly 500 organizations spanning the freight ecosystem: public ports, private terminals, barge lines, railroads, trucking companies, shippers, state agencies and service providers.

The association organizes its members across 11 river basins, reflecting the geographic diversity of U.S. inland navigation. While IRPT began with a focus on the inland river system, its scope has expanded significantly. Today it also serves members connected to the Gulf Intracoastal Waterway, the Great Lakes, the Pacific Coast and navigable waterways throughout the nation's heartland.

"At the end of the day, it's all about freight and the movement

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of freight," Andres said. "We're not just serving waterways, we're serving the nation's supply chain."

IRPT's mission centers on three pillars: business development, advocacy and education, at both the state and federal levels. That combination has positioned the association as a key voice for smaller ports and terminals that often struggle to compete for attention and funding alongside their larger coastal counterparts.

LEVELING THE FUNDING PLAYING FIELD

When asked which accomplishments she is most proud of, Andres immediately pointed to IRPT's role in shaping the federal **Port Infrastructure Development Program (PIDP)**.

Before the program was restructured, small inland ports were forced to compete directly with mega-ports like New York–New Jersey or Long Beach for a limited pool of federal infrastructure dollars. IRPT saw the imbalance and took action.

In 2019, the association helped write legislation establishing a "small port, small project" category within PIDP. The result: a dedicated funding pool that allows small ports to compete against peers with similar scale and needs.

Since then, Andres said, $112 million per year has been set aside for small-port projects, funding roughly 50 projects nationwide. "That program is near and dear to our hearts," she said. "It has changed what's possible for inland ports."

The economic value of inland ports and terminals is often underestimated, Andres said, because their success is measured in what doesn't happen.

"If we didn't have our river system providing that modal option, transportation costs would rise across rail and trucking," she explained. "The competition keeps prices down for everyone."

She pointed to Interstate 70 in Missouri as a vivid example. Without the freight capacity carried by the river system, truck traffic on that corridor would multiply — tripling or quadrupling in some estimates. The consequences would extend beyond congestion to public safety, infrastructure wear and community impact.

Inland waterways, she emphasized, quietly absorb massive freight volumes while reducing highway congestion, lowering emissions per ton-mile and improving overall supply chain resilience.

GROWTH, EFFICIENCY, SUSTAINABILITY

Looking at the system today, Andres sees nearly every port and terminal in growth mode. Investments are flowing into infrastructure, equipment and efficiency improvements, often supported by federal programs such as PIDP and EPA SmartPorts grants.

Ports and terminals are upgrading material-handling systems, increasing throughput and reducing costs. At the same time, they are investing in cleaner equipment and higher-tier engines to reduce emissions and environmental impact.

While public ports often receive the spotlight, Andres is quick to stress the role of private terminals. "There are about 335 public ports in the U.S., but there are tens of thousands of private terminals moving freight every day," she said. "They are essential to the system."

THE INFRASTRUCTURE CHALLENGE

Despite recent progress, Andres is candid about the biggest challenge facing IRPT members: aging infrastructure.

Locks, dams, channels and other navigation assets — many managed by the **U.S. Army Corps of Engineers** — have suffered from decades of underfunding. Authorized projects remain unfinished, and the backlog continues to grow.

Congress has begun asking hard questions, including requesting a comprehensive database of authorized but unfunded projects. Yet progress has been slow, and Andres sees this as a critical advocacy priority.

"We need to know where we are and what it will take to get to a reliable, sustainable system — not just for today, but for generations," she said.

Beyond legislation, IRPT's priorities for 2026 center on business development and shipper engagement. A goal is educating shippers—many of whom are unaware of the inland system's reach and capabilities. That effort extends overseas.

In June 2026, IRPT will lead a member delegation to Europe, including visits to ports and terminals and participation in **Breakbulk Europe**. The trip will also include meetings with European inland port organizations and infrastructure authorities to explore marketing strategies such as "container-on-barge" models and hinterland connectivity.

Domestically, IRPT will continue its extensive schedule of free regional basin meetings and prepare for its annual conference, scheduled for September 1–4 in Kansas City, Missouri.

IRPT: "Not your grandma's association"

Asked why organizations should join IRPT, Andres didn't hesitate. "We are not your grandma's association," she said with a laugh, noting that she, herself is a grandmother! "You should expect more, and you'll get more from us."

For an annual membership cost of $825, members gain access to advocacy, marketing and business development support that would otherwise require multiple full-time staff.

"The sky's the limit on the resources we provide," Andres said.

For information on joining IRPT, **visit: https://www.irpt.net/**

Empowering Future Leaders

Lamar University's Center for Advances in Port Management (CAPM) is a leading institution dedicated to advancing port management and supporting maritime excellence. Located in Beaumont, Texas, the center drives research, education, and innovation for the maritime industry. With state-of-the-art facilities, experienced faculty, and strong industry partnerships, it serves as a hub for knowledge exchange and practical solutions in port operations.

A core part of the center's mission is conducting cutting-edge research that addresses the most significant challenges facing ports today. Faculty experts engage in interdisciplinary projects focused on logistics optimization, sustainability, security, and emerging technologies. This research provides valuable insights that help shape the future of port operations worldwide.

Collaboration with industry partners, port authorities, and government agencies allows the center to maintain a deep understanding of real-world operational needs. These relationships support the development of practical solutions that reduce bottlenecks, streamline processes, and improve overall efficiency. As a result, the center's work helps ports enhance their competitiveness and long-term sustainability.

Beyond research, the center offers comprehensive education and training programs designed to prepare current and future port leaders for the complexities of the maritime sector. Academic offerings include a graduate program and professional certifications in port management, logistics, and supply chain management. These programs blend theory with practical application, supported by faculty expertise and cooperative education with industry partners.

CAPM also provides consulting services to help ports address specific operational challenges and adopt best practices. Drawing on faculty and research capabilities, the center delivers tailored solutions that improve efficiency, reduce costs, and enhance environmental sustainability.

CAPM's outreach efforts extend to the broader community as well. The center offers educational programs that raise awareness of maritime careers and encourage interest in port management. By engaging with students and community members, it helps cultivate the next generation of industry professionals and supports the continued growth and success of the maritime sector.

Photo credit: Lamar University Marketing

Photo of the Q-LNG 4000 ATB, courtesy of Q-LNG

LNG: powering the future of maritime

The maritime sector is critical to the world's economy.

Responsible for the movement of 80% of the goods that people and industries use in their daily lives and activities, shipping literally moves the world.

The fuels that have moved this industry for many decades are in a state of transition. While traditional fuels are still in wide use, the industry – both on the water and shoreside – has recognized that in order to move forward in a more regulatorily driven and emissions-conscious world, changes need to happen.

But it's even more than that. Efficiency and energy security are the name of the game. Developing and maintaining a strategic advantage is critical, both for industry participants as well as the countries that host them. The maritime industry's competitive edge is driven by investment in newer, more efficient vessels and technologies, which continues to drive growth in shipping volumes and fleets as trade expands.

When it comes to fuel, liquified natural gas (LNG) is leading the charge into the future.

LNG is natural gas that has been cooled to a liquid state at about -162°C (-260°F). This process reduces its volume by around 600 times, making it easier and safer to store and transport.

LNG is used across a variety of applications. Many of the world's cities and industries that depend on natural gas for energy are located far from gas fields, making pipelines too impractical or costly to build. By cooling the gas to a liquid form, it can be transported more efficiently on ships as LNG.

LNG is colorless, odorless, non-toxic and non-corrosive, making it a versatile and lower-carbon alternative to other fossil fuels. In its liquid state, LNG will not ignite.

When LNG reaches its destination, it is turned back into natural gas at regasification plants.

But LNG is also an important fuel for the maritime industry, helping those that use it address the 3% of global emissions that the industry accounts for each year.

More and more, the shipping industry is addressing those emissions with ships that accommodate both fossil and bio-based fuels. LNG can provide the shipping industry with a pragmatic bridge to Net Zero.

Available at commercial scale now, LNG delivers lifecycle greenhouse gas reductions versus conventional marine fuel.

Of course, reliable domestic supply matters. In the US, having LNG available encourages shipping lines to call at those

Photo of the Q-LNG 4000 ATB, courtesy of Q-LNG

Photo of the Progress bunker barge courtesy of Shell and Crowley

U.S. ports, increases cargo throughput, and strengthens local economies. For instance, in Savannah, GA, Shell provides LNG to maritime customers from the Elba Island LNG facility. But not all ports have the capability and infrastructure to provide this option to customers right now.

With the lifetime of a vessel measured in decades, shipowners are making technology decisions now that will have lasting impacts across the industry. Ports and policymakers have the opportunity now to consider how to develop the necessary infrastructure to be leaders and incentivize shippers to choose their ports for fueling operations.

Shell operates the world's largest LNG bunkering network, supplying LNG and bio-LNG to vessels at key locations along major international trade routes. And the network is growing, underpinned by Shell's global LNG business, which includes a sizeable portfolio, extensive shipping and storage assets, and access to regasification plants.

The expansion of LNG infrastructure is critically important as over one-third of new ship orders now specify LNG capability. These dual fuel vessels, designed to run on LNG and liquid fuels to maximize flexibility and optionality, can operate using LNG as a primary fuel, can switch to conventional or bio-liquid fuels when required, blend in bio-LNG as the supply scales, and ultimately, transition to synthetic LNG produced from renewable energy. For ports this is key to considering how and when to build out the necessary infrastructure to support shipping customers.

The Progress barge represents one example of America's industrial capability. Built at Fincantieri Bay Shipbuilding in Wisconsin, it is the largest U.S. Jones Act compliant LNG bunker barge, capable of carrying 12,000 m^3 of fuel. Its construction supported American shipbuilders, engineers, and suppliers, and its ongoing operations support port services, tug operators, and maritime labor in Savannah, GA.

Of course, this isn't a binary situation – shoreside operations need to coordinate and work with a variety of stakeholders and others involved in the LNG supply chain in order to ensure that vessels receive what they need. Scaling renewable supply demands investment across the spectrum, from producers to carriers and cargo owners, and long-term partnerships are crucial. Not only that, but supportive policies and regulatory environments are critical elements in this process as well.

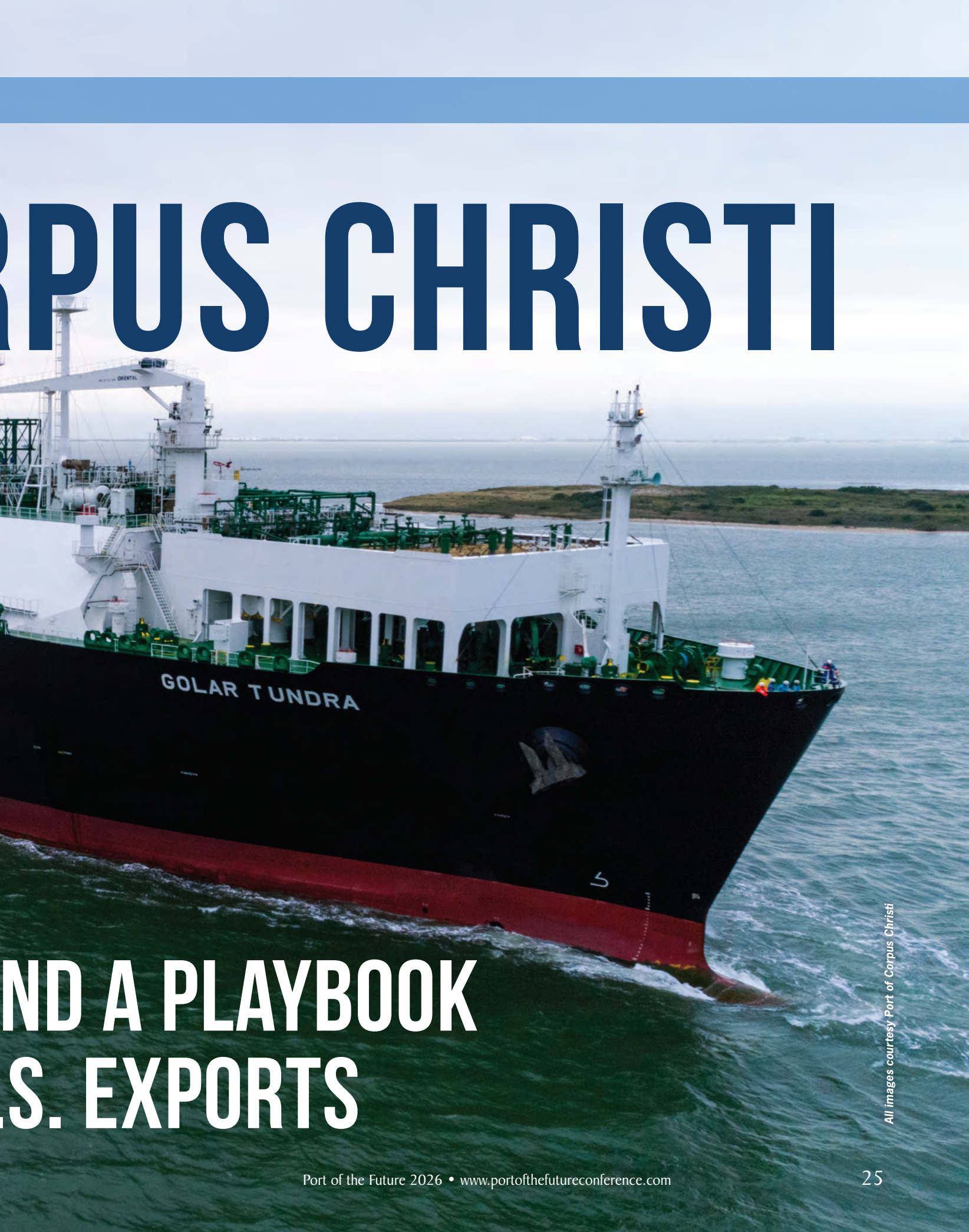
The maritime sector is responsible for enabling the world we live in and is fundamental to where we're heading in the future. Ensuring the build-out of the most at-scale, readily available fuel that is helping to reduce the carbon footprint of the industry while simultaneously moving the industry, and society forward will keep driving this critical industry forward.

Photo of the Progress bunker barge courtesy of Shell and Crowley

PORT OF COR

DEEP WATER, BIG ENERGY, AN
FOR THE NEXT ERA OF U.S

RPUS CHRISTI



ND A PLAYBOOK
.S. EXPORTS

All images courtesy Port of Corpus Christi

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 GREG TRAUTHWEIN

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 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.

*"**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

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

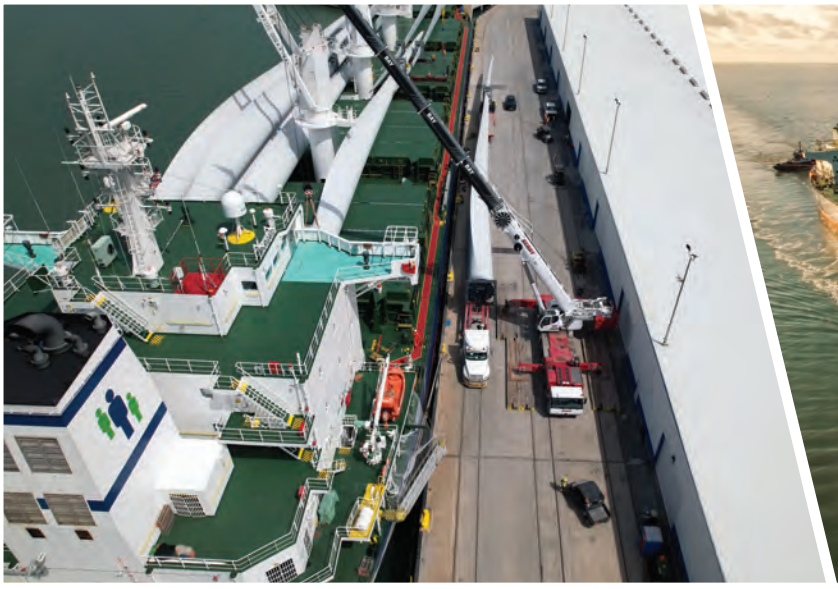
The Port's **2025 tonnage of 203.4 million tons** came in slightly below 2024, and Britton doesn't sugarcoat how much the crude number drives the narrative. When crude is the dominant commodity, even small percentage moves can swing the whole annual result.

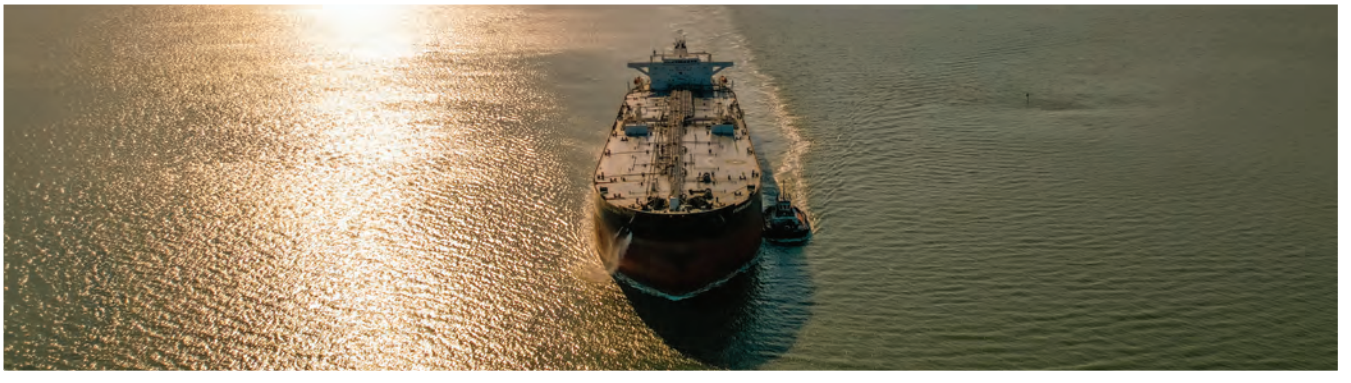
Here's what the Port reported for 2025:

- **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.

PORT OF CORPUS CHRISTI





MAKING WAVES FOR THE FUTURE

Tradition at the Helm. The Future Underway.

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TEXAS A&M UNIVERSITY GALVESTON CAMPUS

"Other than the actual opening of the port 100 years ago, ***the ship channel improvement project is the biggest and most important thing we've ever done here.*** *It's a $600 million project cost shared between us and the federal government that took the depth (of the main ship channel) from 47 feet to 54 feet, and widened it from 400 to 530 feet. Customers can now fully load SuezMax ships, and can more fully load VLCCs. That is a tremendous benefit for our crude oil moving customers."*

Kent Britton, CEO of the Port of Corpus Christi speaking at the Ship Channel Completion Event.

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 Corpus 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


PORT CORPUS CHRISTI


HERCULES I

"[Clients of the port] all want the same thing: ***ease in and out of the waterway, quick time to their dock, as little time on their dock as possible, and 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

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.

INSTITUTE FOR HOMELAND SECURITY
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The Institute for Homeland Security (IHS) at Sam Houston State University focuses on **building strategic partnerships** between public and private organizations through **education** and **applied research in critical infrastructure** sectors such as transportation, energy, chemical, healthcare, public health, water, and wastewater.

Our mission is to provide **innovative, value-added knowledge** to protect critical infrastructure and support commerce, tailored to the needs of industry and government. This is accomplished by **facilitating collaboration activities**, offering **education programs**, and **conducting research** to enhance the skills of practitioners specific to natural and human-caused homeland security events.

IHS offers various resources and programs, including a **Research Library**, **Learning Academy** courses, and partnerships with organizations like the **Port of Brownsville**. We also produce media content such as the "**Structurally Sound**" podcast, which discusses topics related to critical infrastructure and homeland security.

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.

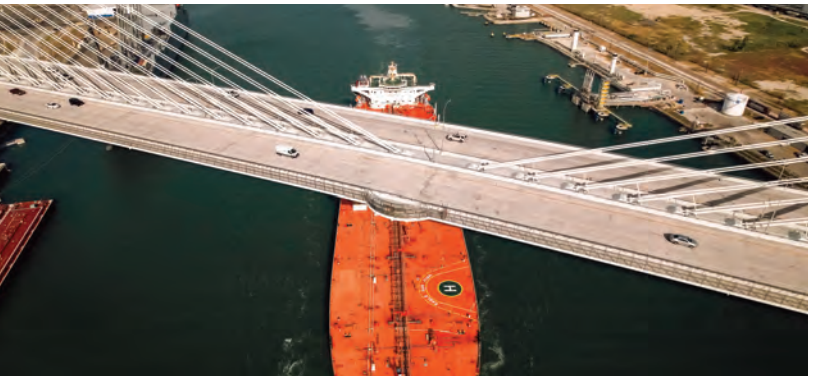
Corpus Christi doesn't operate a container terminal, but Britton is clear-eyed about where automation can matter for a landlord port: use technology to make the waterway more reliable, predictable, and efficient.

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 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.

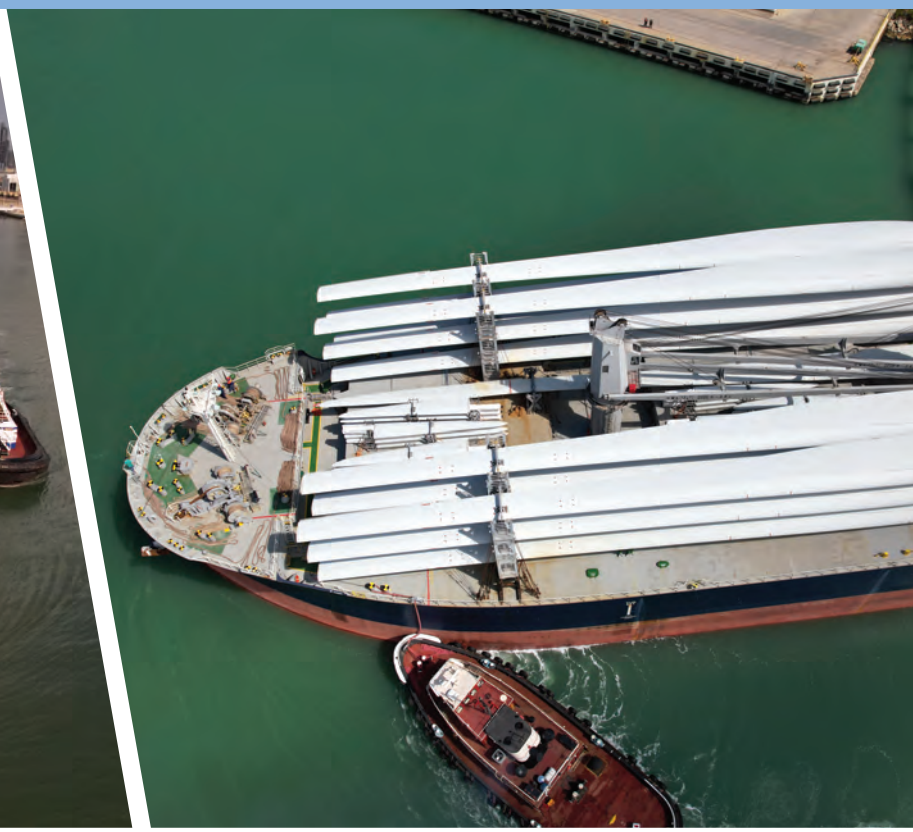
3. Keep existing customers moving faster and cheaper, reducing friction that costs real money at today's charter and demurrage rates.

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.



By Greg Trauthwein

ALTERNATIVE-FUEL INFLECTION POINT:

Courtesy Austal

GOTLAND HORIZON X AND THE PORT HYDROGEN QUESTION

Gotland Horizon X *is a 130-meter, 18,300-gt, 1,500-passenger, 400-car, 30-knot catamaran now under construction at Austal for delivery in summer 2028. Positioned as hydrogen-ready from day one, the vessel is not a technology demonstrator. It is a frontline Ro-Pax ferry designed to maintain timetable integrity while opening a credible pathway toward hydrogen.*

For ports and fuel suppliers, that distinction matters. Horizon X is less about a single vessel and more about what it signals: ***future-fuel ships are coming that will demand corresponding evolution ashore.***

Jonas Moberg, Head of Newbuildings at Gotlandsbolaget, frames the project as part of a long-term strategy rather than a one-off experiment. “We have kept our compass,” Moberg says. The company builds ships to operate them for decades, not to flip them. That mindset forces a hard question: what will fuel economics, infrastructure and regulation look like 10, 15 or 20 years from now?

No one can answer that with certainty. So Horizon X is built around flexibility.

The vessel will enter service capable of operating on LNG and diesel. But its powerplant architecture is designed to transition toward 100% hydrogen when infrastructure allows. In practical terms, that means the ship can operate commercially from day one while positioning itself — and its home ports — for the next phase of marine fuel evolution.

That sequencing is deliberate. Moberg points to Gotland’s 2009 decision to invest in gas-powered vessels before LNG infrastructure was fully mature.

“Without having the infrastructure in place for fueling, we took a bold decision and we built the ships,” he says. They entered service in 2018 and 2019 and have operated successfully, blending LNG and biogas where available.

Horizon X follows the same philosophy: move forward, but do not strand the asset.

WHY BATTERIES DIDN’T FIT

The Gotland route between mainland Sweden and Gotland Island is roughly 80 nautical miles, requiring high-20-knot service speeds — about 28.5 knots — to maintain the three-hour crossing that defines the product.

Batteries were evaluated. But the energy demand of a large high-speed Ro-Pax vessel makes full battery propulsion impractical at this scale. The weight penalty alone challenges performance, and charging infrastructure at the required magnitude is, for now, unrealistic.

That pushed the design team toward fuel-based solutions — and ultimately toward hydrogen as the long-term objective.

But hydrogen cannot be viewed in isolation from the vessel’s operational needs. The ferry must deliver 30-knot performance, carry 1,500 passengers and 400 cars, and operate year-round. Emissions reduction cannot come at the expense of service reliability.

A COMBINED-CYCLE FERRY POWERPLANT

At the heart of Horizon X is a propulsion system derived from Siemens Energy’s Ocean Green Hybrid Combined Cycle concept introduced in 2022.

Each hull houses a combined-cycle plant built around the Siemens Energy SGT-400 gas turbine, producing 13 MW per unit. Waste heat from the turbine exhaust is captured by a once-through steam generator (OTSG), producing steam that drives a 5.3 MW condensing steam turbine.

The key design decision: both gas and steam turbines feed

In 2009, Gotland invested in gas-powered vessels before LNG infrastructure was fully mature. ***“Without having the infrastructure in place for fueling, we took a bold decision and we built the ships.”*** *The ships entered service in 2018 and 2019 and have operated successfully, blending LNG and biogas where available. Horizon X follows the same philosophy: move forward, but do not strand the asset.*

Jonas Moberg,
Head of Newbuildings,
Gotland Tech Development

Michael Welch,
Siemens Energy

mechanical drive waterjets via gearboxes rather than generating electricity for electric propulsion. That mechanical approach reduces weight and maximizes efficiency — critical in a high-speed catamaran.

Total shaft power reaches 36.4 MW, with overall efficiency approaching 50%. For comparison, earlier generations of gas turbine ferries in the 1990s operated closer to 30–35% efficiency — insufficient for modern economics.

For Moberg, combined cycle was non-negotiable. Without it, fuel efficiency would not have supported the business case.

Michael Welch of Siemens Energy emphasizes the maturity of the SGT-400 platform. Originally launched in 1997 for oil and gas and co-generation markets, the turbine's twin-shaft configuration allows variable output speeds — well suited for waterjets. Its high exhaust temperature makes it particularly effective in combined-cycle configurations.

The result is a propulsion system optimized not only for peak output, but for part-load efficiency — a critical factor in real-world ferry operations where power demand fluctuates.

HYDROGEN-READY — WHAT THAT REALLY MEANS

"Hydrogen-ready" is often used loosely in shipping. In Horizon X's case, it is tied to a defined development pathway.

Siemens has been working on hydrogen combustion in the SGT-400 for more than a decade. According to project documentation, the platform achieved 100% hydrogen operation in 2023 under the EU-funded HYFLEXPOWER project, with further testing ongoing.

The turbine features a Dry Low Emissions (DLE) system and is designed to meet IMO Tier III NOx limits without SCR. A new combustor configuration allows operation on 100% hydrogen, 100% natural gas/LNG, or blends between, with retrofit potential and minimal changes to the turbine core.

But Moberg is clear: the engine is only part of the equation.

"If you're talking hydrogen, you need a complete arrangement in order to get it on board," he says.

Hydrogen's small molecular size, storage challenges and safety requirements mean that fuel handling systems define practical fuel flexibility. Designing a ship capable of storing and managing hydrogen — whether liquid or pressurized — requires careful integration with classification societies, port authorities and regulators.

The vessel's ability to transition fuels does not eliminate the need for shore-side readiness. It amplifies it.

PORTS AS THE NEXT BOTTLENECK

Today, ordering diesel is simple. Ordering hydrogen is not.

The transition from LNG to hydrogen introduces a new layer of complexity for ports:

- Dedicated storage infrastructure
- Safe transfer systems
- Regulatory frameworks
- Supply chain reliability
- Crew training and emergency protocols

Horizon X highlights a critical point for port operators and energy suppliers: ships can be built ahead of infrastructure, but only up to a point. If hydrogen-ready vessels enter service without parallel port investment, the transition stalls.

Moberg acknowledges this reality. The ship will operate conventionally until hydrogen bunkering becomes viable. That means LNG and diesel capability remain essential in the near term.

However, by committing to hydrogen readiness now, Gotland effectively signals to ports and energy providers that demand is coming. In fuel supply chains, credible demand often drives investment.

HAVOC

The Future of Port Operations:
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Havoc is the standard for autonomous collaborative maritime operations where safety, speed, and cost-efficiency are paramount.

Havoc delivers complete autonomous capability, combining the industry's premier software stack with high-quality, mission-specific vessels. Through a single pane of glass, operators gain total situational awareness and real-time operational control of a heterogeneous, multi-domain array. One operator can direct complex objectives — such as wide-area port security or infrastructure monitoring — while Havoc fleets execute those tasks across dozens or even hundreds of platforms simultaneously, from hundreds or thousands of miles away.

Havoc autonomy integrates legacy assets and new, specialized platforms into a single, manageable force. By partnering with industry leaders using sophisticated design and materials, we scale capacity quickly — delivering advanced maritime intelligence, often at 10–20% of the cost of competitors.

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Watch the full interview with Jonas Moberg & Michael Welch @ MARITIME REPORTER TV

ENGINEERING CHALLENGES AND APPROVALS

Adapting a land-based turbine for marine use required extensive collaboration with DNV for type approval of the turbine core, package and control systems.

Combined-cycle integration presents additional complexity. Weight and volume are critical in a high-speed catamaran. The OTSG was selected specifically for low weight and compact footprint.

Fuel handling presents further engineering hurdles. LNG operations bring boil-off management issues, and high-pressure fuel requirements add design complexity. Hydrogen introduces even greater challenges, particularly in combustion dynamics and flashback prevention.

These are not incremental adjustments. They are system-level integration exercises.

THE COST OF FLEXIBILITY

Moberg estimates a capital cost premium of roughly 25% compared to a more conventional vessel of similar capacity.

Under pure head-to-head economics, that premium would be difficult to justify. But Horizon X is part of a broader fleet strategy with strong seasonal demand peaks. High capacity and high speed unlock value in summer operations while future-proofing the asset for a 25-year lifecycle.

"If we would have gone on a fuel cell version we would have been more locked in," Moberg says. "The flexibility here is key."

Fuel cells might offer efficiency benefits, but they risk technological lock-in. A multi-fuel turbine platform provides optionality — critical in an era of regulatory uncertainty and volatile fuel pricing.

PART-LOAD EFFICIENCY: A PRACTICAL INSIGHT

One of Moberg's most significant observations concerns part-load performance. Traditional gas turbines lose efficiency sharply away from full power. Combined-cycle configuration flattens that curve.

"Efficiency actually is almost flat from 100% down to 50% or lower," he notes.

For ferry operators, that changes the calculus. Ships rarely operate at full power continuously. Designing for real-world operating profiles — not theoretical peak conditions — is essential.

A SIGNAL TO THE FUEL SUPPLY CHAIN

Horizon X does not assume hydrogen infrastructure will appear overnight. It does something arguably more important: it commits to a vessel architecture that can absorb hydrogen when ports are ready.

For maritime fuel suppliers, the message is clear. Demand for hydrogen bunkering will not originate from speculative small craft or isolated pilot projects. It will come from large, high-capacity vessels operating on fixed routes with predictable schedules.

That predictability — daily calls, defined volumes, stable service life — makes ferry operators ideal early adopters of new fuels. If ports align investment with such operators, the hydrogen supply chain can scale in measured, commercially grounded steps.

A FUTURE-FUELS BLUEPRINT

Horizon X is not simply a fast catamaran. It is a strategic bridge between LNG-era decarbonization and a hydrogen-capable future.

The vessel maintains timetable discipline, preserves operational reliability and introduces a propulsion architecture that avoids technological dead ends.

For ports, fuel suppliers and maritime stakeholders, the takeaway is straightforward: alternative-fuel vessels are no longer theoretical. They are entering construction.

The question now shifts from whether ships can burn hydrogen to whether ports can supply it.

Gotland Horizon X suggests the clock is ticking.

By the Numbers: Gotland Horizon X

Type:	High-speed Ro-Pax catamaran, multi-fuel, hydrogen-ready
Length:	130 meters
Beam:	30.5 meters
Gross tonnage:	18,300
Speed:	30 knots
Capacity:	1,500 passengers and 400 cars
Crossing:	~140 km / 80 nm, ~3 hours
Power into waterjets:	about 36 MW (interview) / 36.4 MW (technical paper)
Builder / contract:	Order placed February 2025 with Austal
Delivery / entry into service:	Moberg cites summer 2028 delivery; the technical paper targets entry into service in 2029
2 x	Siemens Energy SGT-400 gas turbines (one per hull), 13 MW each (guaranteed at 10–20°C ambient)
Waste heat recovery:	once-through steam generator (OTSG), up to 55 bar, 510°C design inlet temp
Steam turbine:	5.3 MW condensing
Total shaft power to waterjets:	~36–36.4 MW
Overall fuel efficiency:	close to 50%
Drive concept:	gas turbines drive steerable waterjets; steam turbines drive booster waterjets (mechanical drive via gearboxes)
Electrical supply:	1 MW PTI/PTO on main gearboxes + BESS + auxiliary gensets; shore connection for cold lay-up
Emissions:	Tier III NOx compliance (<2 g/kWh E2/E3) without SCR; methane slip expected <0.014 g/kWh (50–100% MCR)
Future fuel pathway:	retrofit combustor for 100% hydrogen capability; blends supported

Photo courtesy of Stowlog

Location: APM Terminals P400 (Port of Long Beach)
People from left to right: Jorge Juan, CDO (Stowlog) Betty De la Rosa, HSSE Department (APMT PEB) Jose Gutierro, CTO (Stowlog) Candice Reville, HSSE Manager (APMT PEB) Henrik Kristensen, Managing Director (APMT PEB) Pablo Aguirre, CEO (Stowlog)

Digitizing Safety & Security:
How U.S. Ports Are Gaining Efficiency with Stowlog

Across the United States, container terminals are under increasing pressure to strengthen security, ensure regulatory compliance, and streamline operations — all while handling growing cargo volumes and complex contractor ecosystems. Traditionally, many of these critical processes have relied on spreadsheets, paper forms, emails, and manual validations. The result: limited traceability, operational bottlenecks, and unnecessary risk exposure.

Stowlog, a modular SaaS platform designed specifically for port-logistics environments, is helping U.S. terminals transition toward a fully digital HSSE ecosystem — improving both safety and operational efficiency.

At some terminals of Port of New York & New Jersey, safety inductions and contractor processes were transformed from fragmented manual workflows into a centralized digital system. By digitizing safety training, visitor management, and permit-to-work procedures, the terminal achieved greater visibility, standardized compliance, and reduced administrative workload for HSSE teams.

On the West Coast, APM Terminals P400 in Port of Long Beach modernized its safety and access processes, enabling real-time tracking and digital verification before personnel entered operational areas. Meanwhile, in the main ports of Florida, South Florida Container Terminal in Port Miami and Florida International Terminal in Port Everglafes implemented Stowlog to replace paper-based inductions and visitor handling, significantly improving gate efficiency and ensuring all stakeholders were properly trained before accessing restricted zones.

By integrating modules such as Safety Induction, Visits Management, Geoposition, and Control of Contractors among others, U.S. ports are moving from reactive compliance management to proactive risk control.

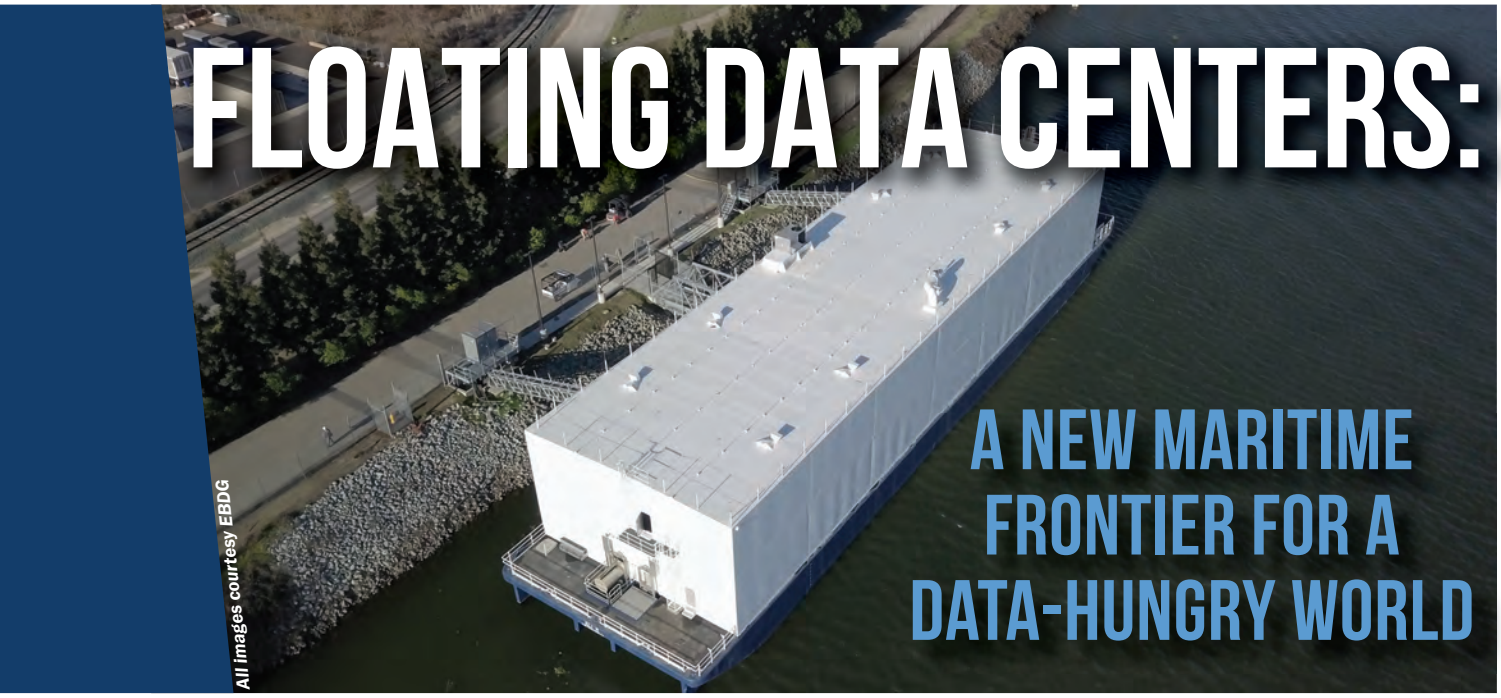
The result is not just digital transformation — it is safer terminals, clearer accountability, and more efficient workflows that allow port professionals to focus on operations rather than paperwork.

In a sector where security is critical infrastructure, digitalization is no longer optional — it is foundational.

Pablo Aguirre is CEO and co-founder of Stowlog, driving digital transformation in port safety and security across 15 countries through strategic leadership and HSSE expertise.

By Greg Trauthwein

FLOATING DATA CENTERS:



A NEW MARITIME FRONTIER FOR A DATA-HUNGRY WORLD

All images courtesy EBDG

As global demand for data storage and processing accelerates — driven by cloud computing, streaming media, and the explosive growth of artificial intelligence — the physical footprint of data centers has become a growing challenge. Land-based facilities face mounting constraints: limited space, water scarcity, grid congestion, long permitting timelines and rising community opposition. Against that backdrop, a once-niche concept is moving rapidly into the mainstream conversation: floating data centers.

For maritime designers, shipyards, and offshore infrastructure specialists, floating data centers represent a convergence of digital demand and marine engineering, one that could evolve into a significant new market segment over the coming decade.

Few firms have deeper firsthand experience in this emerging space than Elliott Bay Design Group (EBDG). The Seattle-based naval architecture and marine engineering firm helped design and support construction of what is widely regarded as the world's first operational floating data center, an installation in Stockton, California that has been operating successfully for several years.

"That first project gave us real insight into what works, what doesn't, and where the market could go," said Mike Complita, Principal in Charge and Vice President of Strategic Expansion at EBDG. "At the time, it was a bit ahead of the market. Now, with AI and data growth, the interest has come back in a big way."

BY THE NUMBERS: ELLIOTT BAY DESIGN GROUP

Today, EBDG offers the industry its expertise from an internal crew of 70+, a number that has grown steadily in recent years alongside a strong market for specialized marine design services. Historically, about half of the firm's work has been focused on passenger and vehicle ferries, with the remaining half spread across a diverse mix of projects.

"It's that other 50% where we get to work on some really wild and interesting things," Complita said. "Floating data centers definitely fall into that category."

THE CASE FOR FLOATING DATA CENTERS

At the core of the floating data center concept is one primary advantage: access to cooling water. Traditional land-based data centers consume enormous volumes of freshwater for cooling, often drawn from rivers, aquifers, or municipal systems, and substantially lost to evaporation. In contrast, floating data centers use surrounding water bodies as a closed-loop cooling medium.

"You've got an essentially unlimited source of cooling water that you're not consuming," Complita explained. "That's a huge advantage in a world where freshwater is becoming increasingly precious."

Environmental concerns around thermal discharge are often raised, but real-world data from the Stockton installation suggests those fears may be overstated. Studies conducted prior

to deployment—and validated during operation—found that temperature changes in the surrounding water were negligible within just a short distance of the hull.

Beyond cooling, floating platforms offer additional benefits:

- **Rapid deployment:** Floating data centers can be designed, built, and deployed in roughly two to three years, compared with five to eight years for large land-based facilities.
- **Mobility and flexibility:** Built on barge platforms, they can be relocated, expanded, or redeployed as demand shifts.
- **Reduced land use:** No need to clear forests, rezone land, or build massive new concrete structures.
- **Repurposing existing assets:** The Stockton project reused a 1970s-era barge hull, minimizing new environmental impact.

"That reuse aspect was intentional," Complita said. "Instead of creating a new footprint, we were able to repurpose something that already existed."

THE BIGGEST CHALLENGE

While cooling is a natural advantage offshore, power generation remains the most significant technical and economic hurdle.

Modern data centers are extraordinarily power-hungry. Even relatively small installations require 10–12MW, while current market inquiries are clustering around 30–80MW, with AI-focused facilities pushing into the 100–300MW range.

"To put that in perspective, that's far more power than most ships use just to operate," Complita said. "The amount of onboard generation, fuel storage, and redundancy required is enormous."

For fully autonomous floating data centers — those not tied into shore power — the space required for generators, fuel, exhaust systems, and redundancy can exceed the footprint of the data center itself. Fuel logistics also become a major operational consideration, particularly when continuous uptime is non-negotiable. "These facilities can't just shut down and go to a shipyard for maintenance," Complita noted. "Everything has to be designed with redundancy so operations continue uninterrupted."

In the U.S., floating data centers tethered to shore and carrying no passengers are not Coast Guard-inspected vessels. However, most owners are choosing to pursue voluntary class certification through organizations such as ABS or DNV.

"Class societies are starting to develop rule sets specifically for floating data centers," Complita said. "That's important for insurance, financing, and long-term asset management."

While classification requirements differ from those of traditional ships, owners should still expect periodic inspection, maintenance planning, and lifecycle management considerations more akin to offshore infrastructure than conventional barges.

DESIGNING FOR DATA, NOT CARGO

From a naval architecture perspective, floating data centers may resemble barges, but their design priorities are fundamentally different. The cooling system is the most critical and complex element, operating at a scale far beyond typical marine applications. Intake systems must minimize environmental impact, avoid harming marine life, and prevent debris accumulation, all while handling massive water flows.

EBDG's Stockton design incorporated low-flow intake velocities and sophisticated, proprietary screening systems to ensure fish and marine organisms could safely swim away from intakes.

Another emerging concern is motion sensitivity. While protected harbors pose little risk, offshore deployments introduce vessel motions that can affect servers, cooling systems, and power generation equipment.

"As we look at more exposed or offshore applications, motion control becomes a serious design consideration," Complita said.

At the core of the floating data center concept is one primary advantage: access to cooling water. "You've got an essentially unlimited source of cooling water that you're not consuming. That's a huge advantage in a world where freshwater is becoming increasingly precious."

Mike Complita,
Principal in Charge and Vice President of Strategic Expansion at EBDG

FROM PROTOTYPE TO SCALE

The Stockton floating data center, operating in the 10–12MW range, served as a functional prototype. Today's market interest is dramatically larger.

"We're seeing baseline requests at 30 megawatts, most in the 50 to 80 range," Complita said. "Once AI comes into play, that jumps even higher."

At those scales, floating data centers are no longer single platforms but modular fleets — multiple barges operating together, offering scalability unmatched by land-based construction.

"That scalability is another big advantage," Complita said. "You don't have to build everything at once. You can grow as demand grows."

While floating data centers remain a small slice of the global data infrastructure today, momentum is clearly building. What was once an experimental concept is now drawing serious interest from major players in both the technology and maritime sectors.

"For a long time, this was a curiosity," Complita said. "Now it's something companies are looking at strategically to get ahead of their competitors."

For shipyards, designers, and marine equipment suppliers, floating data centers could represent an interesting opportunity: a high-value, technology-driven market that leverages core maritime expertise while opening the door to a rapidly expanding digital economy.

As data demand continues to surge, the question may no longer be whether floating data centers make sense, but how quickly the maritime industry is ready to deliver them.

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