

MARITIME REPORTER AND ENGINEERING NEWS

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November 2025

GREEN
BREAKERS

Canada, Finland, U.S. up the ante to Catch Russia in Arctic Operations

*Matt Binsfeld, CEO, Brennan
From "Yard Dog" to C-Suite*

*Life Extension & Conversion
Redefines "Born Again" in
U.S. Ship Repair*

*Greener Offshore Vessels but
Efficiency First @
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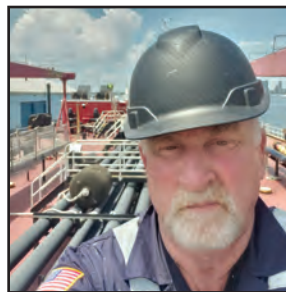
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The U.S. maritime industry is experiencing a renaissance like I've not seen in my 33+ years in this seat. I've said it before and will write it again: I've heard more about 'maritime' and 'shipbuilding' from the federal government in the first six months of this year than I've heard in the past 33 years combined ... and that's no exaggeration.

I was in Virginia a few weeks ago for the **Society of Naval Architecture and Marine Engineers (SNAME)** Annual Conference, the first I've attended in several years. Our company's relationship with SNAME extends back for generations, and personally I have nearly three decades attending SNAME events. With a travel swing that included nine consecutive weeks of air travel, I was 50/50 when the SNAME event came into view. After attending the 2025 event, I can unequivocally say that if you missed it, you've missed a good one. The annual meeting – while still modest in size – had and energy and a vibrance that I'd not personally seen in nearly 20 years. The conference rooms and exhibit hall were filled with students of all levels seeking cues on the direction of their future career, and the conference sessions I was able to attend were strong. The opener was a panel discussion moderated by **Glosten CEO Morgan Fanberg** and featuring an A-list of shipbuilders, engineering and academia + an excellent panel on Icebreakers, the cover feature of this edition, moderated by **Genoa Design COO Laurie Balan** and featuring another excellent line-up with the same mix.

As Fanberg said in opening his panel, "The U.S. maritime industry has moved from the margins to Center Stage," though admittedly aside from the big U.S. Navy shipbuilding primes, many companies in the mid- to small-sector are still waiting to see how all of the political fireworks positively impact their bottom line.

To say that icebreakers are 'hot' is an



Photo Justin Zurre

understatement, as Russia's dominance in the Arctic – as outlined in great detail in Alisa Reiner's article in the October 2025 edition – as stirred a patriotic fervor to build fast. On Balan's panel at SNAME, veteran shipbuilder Jim Carr, SVP Engineering, Seaspan Shipyards summed it up best in discussion his company's partnership with Bollinger Shipyards and Rauma Marine Constructions to build U.S. icebreakers: "This is the fastest I've moved on a shipbuilding program in my career."

Starting on page 53, our friend **Phil Lewis**, Director of Research, Intelatus, does what Phil does best: Writes an in-depth, informative manifesto on the the current status and future direction of a market sector, in this case ... icebreakers.

On a final note, I'm happy to share my interview with **Matt Binsfeld, CEO, Brennan**, starting on page 36 and entitled "*From 'Yard Dog' to the C-Suite*". I met Binsfeld over the summer at WODCON '25 in San Diego, subsequently spending an hour with him recording for our **Maritime Matters Podcast**. The Brennan story is quintessential maritime: multi-generational, multi-faceted with highs and lows galore. In the end, a strong company steadfastly committed to its family roots, its employee family, its community and its country.

Gregory R. Trauthwein
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DIGITALIZATION, DATA & “A SINGLE SOURCE OF TRUTH”

Where does true value lie in maritime digitalization? How are shipowners leveraging improvements in data quality and how can a single source of truth support and inform decision-making?

To kick-off London International Shipping Week, ABS Wavesight assembled a panel of industry leaders to seek out the answers, with CEO Staci Satterwhite asking the questions.

The panel - made up of **Robert Gaina, SVP, Commercial at Ardmore Shipping**, **Niraj Nanda, Chief Commercial Officer at Anglo-Eastern** and **Robert Desai, Chief Executive Officer at V. Ships** – had the task of unpacking the shipping industry’s progress in successfully adopting digital tools.

Finding Value

To Robert Gaina, the definition of digitalization is “finding simplicity in complexity and identifying the areas of greatest value: regulatory compliance and operational efficiency across the board”. For Ardmore, the ability to leverage a sin-

gle source of truth in its data is in reality a process of creating trust, he explained. “A single source removes the debate and generates trust in commercial and technical functions and is something you can share externally to charterers and finance providers” he added.

Niraj Nanda cast digitalization as a process that enables collaboration across functions that can transform decision-making and drive operational excellence. “The result is strategic leadership. It’s not just a tech upgrade; it’s a functional transformation in how we manage complex maritime systems,” he said.

Nanda identified the ability to unify data as the source of greatest value – a single source of truth, sharing validated, verified information across stakeholders. “Making processes more automated also reduces administration for crew and offices because you eliminate repeated reporting,” he added.

Robert Desai took the discussion further. He pointed to the fact that very large, corporate owners are the exception in shipping, not the rule. Most are asset light and less focused on the

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*Where does true value lie in maritime digitalization? How are shipowners leveraging improvements in data quality and how can a single source of truth support and inform decision-making? **ABS Wavesight CEO Staci Satterwhite** assembled an All-Star panel at LISW to get some answers.*

opportunities that better digital technology might bring them.

“Digitalization is the opportunity to bridge that gap and create a new and different paradigm where compliance and operational decisions are based on the idea of horizontal decision making,” he suggested.

“Traditionally Shipping doesn’t run like that, but if we can break through that barrier, we can make decisions that really add stakeholder value. It’s the kind of step change digital can deliver.”

The question of a single source of truth is one that answers itself, he argued. The alternative is the confusion and conflict that too often exists now. The competing interests that define so much of the shipping business mean that competitive players increasingly need the best data at their fingertips.

Data Quality

Issues around data quality continue to create obstacles, but Niraj Nanda contended that support is available. While industry fragmentation is undeniable, ship managers with the appropriate scale can help, with proven platforms in place for shipowners to adopt without needing to build from scratch.

“The systems are tried and tested and reflect your goals – whether that’s emission tracking, predictive maintenance, or business decisions. The right strategy is to choose the parts that best reflect your ambitions,” he said.

The ability to operate a full-scale fleet performance center simply wasn’t possible a few years ago but is now proven in real-world business cases for digital-driven optimisation. “Our Fleet Performance Centre monitored over 640 vessels in 2024, cutting fuel use by 63,000+ MT and CO₂ by 189,000+ MT, saving USD 38 million,” said Nanda.

“One of our ambitions is to use high speed data from ships at sea to improve visibility and maintenance of onboard assets - this has been achieved by our Asset Management & Technical Support Division, using high-frequency telemetry, predictive maintenance algorithms, and AI-assisted dashboards. These insights power condition-based maintenance, reduce downtime, and extend asset life, transforming ship management from reactive to proactive, data-driven operations. As

data quality increases, so reliability grows.”

Robert Gaina acknowledged that the path to data quality can mean taking a sledgehammer to the silos and, even then, being prepared for a long rebuilding process.

“Digital solutions enable you to break silos and once you all have same data there’s not going to be any debate,” he explained. “Our belief is that efficiency creates top line revenue, we’ve been looking at how to improve performance from day one. In 2013 we shared our ambition to eliminate multiple noon reports. It’s 2025 are we are still fighting that battle.”

VShips employs AI to predict risk that Robert Desai believes can help change the traditional shipping mindset. The practical challenges include how to deploy cutting edge technology on existing vessels across a global fleet which spans leaders and laggards. “I’m in favour of the idea of borrowing from other industries rather than waiting 10 years for shipping to figure it out. If we don’t do that, we will increasingly find ourselves on a path where what the shipping industry can deliver diverges from what the IMO demands.”

What Matters Most

So, what is the one metric that shipowners need to focus on in a period of transition that promises to be a bumpy ride, but one whose opportunities are unarguable? “For us the key metric is commercial agility that is applicable at all levels,” said Robert Gaina. “High quality data gives us the flexibility and ability to move as we see new ways to make gains.”

Niraj Nanda suggested operational efficiency would always be the critical differentiator. “By constantly measuring, we can make gains and cost savings from data, improve crew wellbeing and simplify our processes.”

Robert Desai advocated for the human factor, expanding from compliance to the near horizon. “We can use technology to help our people to change their thinking and make better decisions. Big capital investments are difficult for a number of reasons, but we shouldn’t miss the low hanging fruit and the opportunity to challenge how our people work and how we can help them improve.”



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FROM RAW TO REAL-TIME: Engineering Big Data for Maritime Logistics Resilience

By Capt Gajanan Karanjikar

For most operators, “visibility” once meant knowing where the ship last pinged on AIS and when the next port call might be. That era is over. The new mandate is to engineer raw, fragmented maritime data, shipboard telemetry, AIS, weather, port calls, terminal sensors, trucking ELDs, rail ETA feeds, and cyber signals into actionable intelligence that not only cuts costs and risk before they materialize but also opens up new possibilities for cost savings. When data are engineered well, safety, schedule reliability, and emissions all move in the right direction, offering a hopeful and exciting prospect of significant cost savings.

The maritime stack is messy by design, featuring legacy onboard systems, sporadic connectivity, differing standards, and port/community platforms that rarely share a common language. Three moves separate leaders from laggards:

1) Model the data, not just the voyage.

Adopting interoperable data models lets disparate sources combine cleanly. The IHO’s S-100 Universal Hydrographic Data Model, now adopted by hydrographic offices and navigation providers, demonstrates how standardized schemas enable the fusion of various data sources. That same philosophy applies to logistics, telemetry, and operations data.

2) Build features, not dashboards.

Feature engineering, turning raw streams into predictive variables, beats prettier maps. From AIS tracks, you can derive “approach instability,” “loiter time,” or “ETA slippage velocity.” Whether you get “probable speed loss” and “green-water exposure risk.” From port feeds you compute “berth contention index.” These become inputs to models that forecast congestion, safety margins, or bunker burn.

3) Close the loop from prediction to execution.

Insight is wasted unless it drives a new route plan, a tug booking, a berth switch, a crew alert, or a cargo reprioritization. The best systems pipe model outputs into the TMS, port community system, VTS, or a master’s decision support tool.

Proof Points: Early Outcomes and Maturing Use Cases

- **Fuel and emissions:** AI-assisted navigation and encounter-risk prediction can significantly reduce the need for avoidance maneuvers and route deviations, thereby saving fuel and reducing CO₂ emissions. A recent industry analysis estimated

that AI could reduce CO₂ emissions by up to 47 million tonnes annually by optimizing maneuvers and minimizing close-encounter deviations, resulting in approximately \$100,000 in fuel savings per vessel in specific trades. That’s not speculative; it stems from measurable changes in how crews handle high-risk contacts in open waters.

- **Congestion forecasting:** Academic and industrial groups are publishing methods to predict port congestion from vessel trajectories and multiscale AIS features. These models move beyond “ships at anchor” snapshots toward leading indicators of pileups days in advance, allowing operators to resequence port calls or swap services to preserve schedule integrity.

- **Cyber resilience as a logistics variable:** As ports digitize, cyber risk becomes a schedule risk. The Port of Los Angeles’ Cyber Resilience Center, built with industry partners, demonstrates how shared telemetry and threat intelligence reduce system-wide exposure. In 2023 alone, the port reported blocking hundreds of millions of intrusion attempts, a striking indication that cybersecurity has become an operational KPI, not just an IT concern. Data pipelines that fuse OT and IT telemetry enable earlier detection and faster containment, protecting berth systems, gates and documentation flows.

• Safer, cleaner, more efficient vessels:

Maritime Reporter/MarineLink has documented the shift to digital condition monitoring, predictive maintenance, and voyage optimization as mainstream tools, with less hype and more ROI. The through-line is that engineered data streams and onboard decision support measurably improve availability and safety while meeting tightening environmental rules.

Three Field Cases (names withheld)

- **Case A – North America trades (container):** Sailing into repeated berth delays, a carrier integrated AIS-derived approach instability, tug/berth assignments, and union shift calendars into a single congestion predictor. When the model crossed a threshold, the NOC received a “re-sequence” recommendation with cost deltas. In one quarter, they reduced idle-at-anchor by 18% and preserved two weekly service windows that would have otherwise slipped, worth millions in downstream penalties. (Key lesson: operator trust rose only after predictions flowed into the actual stow/rotation planning tool.)

• Case B – Project cargo (MPP/heavy-lift):

A multipurpose operator fused high-resolution weather with hull response models to flag anticipated accelerations on a

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loaded reel deck. The system pushed route and speed set-points to stay within lashing design limits, along with a dynamic inspection checklist, to the chief mate and superintendent. The shipment cleared with no rework at the destination and avoided a likely claims dispute. (Lesson: the winning move was featuring engineering, turning weather grids into acceleration exceedance probabilities, not a prettier weather overlay.)

- **Case C – Gulf refinery export chain (liquids):**

A refiner's marine desk linked berth sensors, custody transfer logs, and trucking/rail ETAs to forecast line pack and flare risk during a maintenance cycle. The model recommended swapping two inbound parcels and pre-positioning a chartered barge. Net: no demurrage, reduced flaring, and tighter product specs. (Lesson: treating terminal + hinterland as one system surfaced options that neither side saw alone.)

Architecture: The Maritime Data Flywheel

A resilient pattern is emerging across fleets and ports:

- **Open ingestion layer:** stream AIS, ECDIS/NOON, engine telemetry, weather, tides, satellite imagery, port community feeds, and cybersecurity logs.

- **Standards & semantics:** anchor on mature schemas (e.g., the S-100 family, where relevant for nav layers) and build a shared business ontology for port/terminal logistics events.

- **Feature store:** reusable features such as “ETA slippage velocity,” “berth contention index,” “probable speed loss,” “approach instability,” and “gate dwell predictor.”

- **Model factory:** time-series forecasting for ETA and dwell, classification for encounter risk, reinforcement learning for routing under constraints, anomaly detection for OT/IT security.

- **Decision integration:** APIs into VTS/port community systems, the carrier's NOC, terminal operating systems, WMS/TMS, and crew decision-support, so predictions turn into bookings, plans, and alerts.

- **Learning loop:** post-voyage audits reconcile plan vs. actual, retraining the models, and hardening governance.

Big data without governance becomes the next silo. Three rules keep programs credible:

1. **Provenance & quality:** A shared catalogue that records data lineage, sensor calibration, and last-known reliability.

2. **Privacy & security by design:** Zero-trust access, encryption, and strict purpose limitation, especially for OT streams. The LA CRC model of shared intel with strong controls is instructive.

3. **Human-in-the-loop ops:** Stakeholders must be able to see why the system recommends a decision and how it affects safety margins, not just costs.

The Road Ahead: Five Bets for the Near Future

- **From visibility to foresight:** Congestion prediction will move from research to routine operations, with carriers and ports aligning incentives around earlier re-sequencing and berth swaps.

- **Cyber telemetry as an ETA variable:** As ports publish security posture signals, voyage/ETA forecasts will incorporate cyber risk the way they integrate already weather.

- **Embedded sustainability:** AI-assisted conning and route optimization will be measured in avoided tonnes of CO₂ and MARPOL-aligned compliance, not just minutes saved. Expect charter parties to reference these metrics directly.

- **Standardized data products:** S-100's approach will influence broader logistics data products (e.g., standardized berth availability tiles, channel condition layers, and terminal performance feeds) that any ecosystem player can subscribe to.

- **Autonomous and semi-autonomous sensing:** Persistent Ocean drones and pier-side sensors will fill blind spots, feeding predictive maintenance and security models across blue and brown water corridors.

Challenges & Considerations

Implementing a big data pipeline in the maritime industry requires addressing several key challenges:

- **Data integration:** Maritime data is often siloed and comes from varied, usually unstructured, sources, requiring significant effort to standardize and integrate.

- **Data quality:** Ensuring the accuracy of data from a multitude of sources is critical for reliable analysis.

- **Talent shortage:** The industry often lacks employees with the specialized skills needed to manage and analyze big data effectively.

- **Cybersecurity risks:** The increased reliance on digital systems exposes operations to greater cybersecurity threats, necessitating robust security measures.

- **High costs:** Implementing advanced AI and big data systems requires significant investment in infrastructure, software, and training.

Few were rightly skeptical in 2015, asking whether big data held more value or risk, and in the same year, documenting how data-driven ops were already delivering significant savings in practice. Today, the question is settled: the winners are the teams that engineer data end-to-end, align predictions with decisions, and keep humans in the loop. The industry doesn't need more heat maps. It requires reliable foresight that prevents demurrage, avoids damage, protects crews, and maintains schedules in a volatile world. That is the promise, and the payoff, of big data done right.

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AI is Useful, but it will not be Brilliant

By Rik van Hemmen

AI is here to stay. Those who don't explore its use and capabilities may soon find themselves left at the dock. At our company, we treat AI like any other engineering tool — no different than finite element analysis or computerized performance prediction. When used well, it's extremely useful. When used poorly, it's useless. At that level, we don't worry about "intelligence." It's more like a fluffy Wikipedia, which, by the way, remains a surprisingly solid source of hard technical information.

Early on, I asked AI to list the causes of slip and fall incidents on stairs. (I purposely avoided the marine term "ladders" to keep it simple.) It produced a neat list which was not particularly innovative, with a few items slightly off, but with one entry that made me pause and think, "Hmm, I ought to remember that one." In that sense, AI works as a kind of global bookkeeper, keeping score on the world's collective knowledge.

Recently, I wrote an article for the OPA90 Forum newsletter. It turned out to be too long, and instead of bothering me to shorten it, the editor asked ChatGPT to cut it from 1,000 to 500 words. He touched it up and sent it back. To my surprise, the message was still mostly intact, but it certainly wasn't in my voice.

So, I decided to ask ChatGPT to rewrite the edited version in the style of Rik van Hemmen. Because I've littered the internet with enough of my writing, it recognized my style and came back with something that was 99% accurate. It looked and felt like me, which was both impressive and a little unsettling.

Over the past few years, I've also been writing historical fiction about the settlement of eastern Monmouth County, New Jersey. The stories are posted slowly on www.vanhemmen.us. They're written in the James Michener style, historically grounded but populated with fictional characters. Fiction allows an author to explore the human dynamics behind the history, the context that pure historical analysis often misses simply because no one wrote it down at the time.

The early chapters explore the encounter between European settlers and the Lenape people. The historical record, written by Europeans, naturally carries a European bias. Native Americans often appear "unsophisticated," but when you write historical fiction, certain truths become self-evident. The Lenape were not backward; they were highly sophisticated,

but were forced to play with a bad hand. Ignoring that is as misguided as claiming that Jews were "unsophisticated" during the Holocaust if the Nazis had controlled the narrative.

In my stories, I try to show Lenape sophistication through their ability to resolve complex issues in trade negotiations, language, mathematics, and their appreciation for new technologies. One chapter, for instance, includes a Lenape man learning to sail a European-style boat.

After my success with ChatGPT on the OPA90 article, I decided to run one of these chapters through it for a light readability edit. It was an unmitigated disaster. ChatGPT filled the text with florid, emotional language and stripped out the long trade discussions. My careful account of a Lenape learning to sail was reduced to: "After some instruction, he quickly learned to sail."

In other words, it deleted the entire purpose of the story.

I tried to coax it back — locking sections, issuing strict instructions — but the story kept collapsing. This was my first real encounter with AI's limits. ChatGPT recognized the text as "historical fiction" and pulled sentence patterns from thousands of similar works online. It learned that most historical fiction avoids lengthy technical or trade discussions — so it deleted them, chasing the average reader's attention span.

That may be fine for producing more readable stories, but it completely destroyed my intent to shift the way we think about Native American history.

If I had accepted ChatGPT's edits, I would have joined the mass of generic historical fiction out there. Instead, I chose to stay the course, trusting my judgment, and maybe leaving behind enough of my own writing that, someday, AI will learn not to delete the trade and sailing discussions.

In the end, AI is very good at producing average noise. It's far weaker at developing novel ideas without human guidance. It reflects the old joke about democracy: the flawed assumption that more than 50% of the time, more than 50% of people are right.

Innovation, truth, and insight still demand persistent human effort — and I'll bet they always will.

For every column I write, **Maritime Reporter & Engineering News** makes a small contribution to an organization of my choice. I nominate the Nanticoke Lenni-Lenape Tribal Nation www.nlltribalnation.org, which works tirelessly to preserve its culture.

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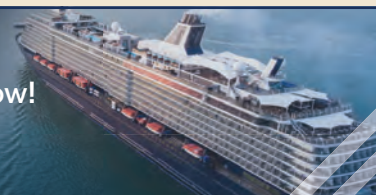
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Intelligence below the waterline: Greensea IQ's Path to Sustainable Maritime Operations

The maritime industry is rapidly evolving in response to the pressures of environmental regulations and rising fuel costs. As decarbonization accelerates, intelligent robotic solutions are coming into sharper focus as a growing awareness of precision underwater robotics for ship maintenance that reduce vessel emissions while keeping humans safe and protecting marine life through proactive cleaning emerge from the shadow of alternate fuels and carbon capture as a low cost, high return investment for owners and operators.

Greensea IQ has spent the past 20 years developing autonomy, navigation, and control software for underwater vehicles across the defense, scientific, and commercial sectors. With a history rooted in subsea innovation and a deep understanding of real-world maritime challenges, Greensea IQ is bringing this robotic technology to its customer in ways that support both operational performance and environmental sustainability.

Two Decades Beneath the Surface

Founded in 2006, Greensea IQ began with a mission to simplify the operation of unmanned underwater vehicles by developing an open architecture software platform. That software, OPENSEA®, now powers thousands of robotic systems used by the U.S. Navy, scientific institutions, and commercial

operators around the world. From explosive ordnance disposal (EOD) to hull inspection to scientific seafloor mapping, OPENSEA's robust autonomy and navigation stack allows vehicles to work reliably and safely in complex environments, often with minimal human intervention.

What sets Greensea IQ apart in the maritime space is its ability to adapt this foundational technology across use cases. Whether it's an Autonomous Underwater Ground Vehicle (AUGV) crawling in the surf zone, a hull robot cleaning a cruise ship in port, or an ROV performing a remote survey from an unmanned surface vessel, Greensea's autonomy systems allow platforms to share a common control interface, data architecture, and navigation solution.

This approach has enabled a new era of multi-mission robots, including its two signature commercial offerings: the EverClean hull grooming service and the Bayonet line of AUGVs.

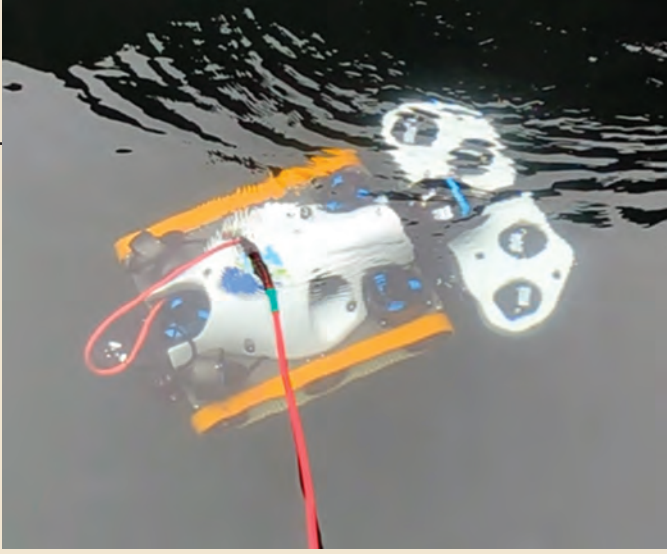
From Clean Hulls to Clear Carbon Goals

While biofouling has long been understood as a performance drag, the magnitude of its impact is often underestimated. Even a thin layer of slime can increase hull resistance by over 10%, leading to higher fuel burn and emissions. Traditional cleaning methods, applied reactively and often too late,

All images courtesy of Greensea IQ



Greensea IQ's robotics platform can be found on defense, commercial and scientific vehicles around the world.



Greensea IQ's advanced autonomy, navigation and software drives all of its marine robotics innovations.

remove this fouling through abrasive force which can damage coatings and potentially pollute harbors with toxic discharge.

Greensea IQ's EverClean service turns this paradigm on its head. Instead of waiting for fouling to develop, EverClean deploys robotic systems to gently and regularly clean ship hulls proactively by removing microfouling before it becomes a problem.

Greensea IQ's hull performance experts work with the customer, vessel crew, Port Authority and in some cases the coatings manufacturer to determine an EverClean performance plan based on vessel coating type, schedule, and current fuel performance, ensuring that ships are always clean, always optimized, and always within compliance.

What makes EverClean relevant to decarbonization is its measurable, data-driven results. The company has shown that ships maintained by EverClean can recover significant hydrodynamic efficiency. On large container vessels, this has translated into hundreds of tons of fuel saved annually and thousands of tons of CO₂ emissions avoided.

EverClean also contributes to the broader environmental picture. By working with coating manufacturers to validate our brush safety and performance on their coatings earning us written approvals and type approvals to clean even the most sensitive high performance coatings including silicon coatings. Greensea IQ's commitment to design technology that is safe to operate without abrasion, to extend coating life, reduce the need for toxic antifouling chemicals, and minimizing the spread of invasive species are key concerns as regulators tighten oversight on underwater cleaning practices.

Autonomy in Service of Sustainability

The strength of Greensea IQ's approach is its versatility. The same open architecture framework that allows a hull robot to deliver precision cleaning beneath a cruise ship can also support subsea systems performing inspections, environmental monitoring, or compliance surveys. Whether stationary or mobile, tethered or autonomous, resident or deployed, Greensea IQ's robotics architecture brings safety,

and intelligence to operations that demand both performance and environmental responsibility.

Greensea IQ's approach to decarbonization involves integrating robotics into standard marine operations. This strategy aims to minimize human involvement while providing an environmentally sound solution to reducing fuel costs.

Looking Ahead: Toward Platform-Agnostic Performance

Greensea IQ's mission to use the power of robot intelligence to extend our reach into the world's oceans efficiently and safely to ensure the protection of the Earth and humankind is our motivation to drive innovation that addresses new biofouling regulations from countries like Brazil, New Zealand and Australia, and the IMO's Carbon Intensity Indicator (CII), the demand is no longer just for "green technology," but for proven systems that adapt across missions and scale with fleet needs.

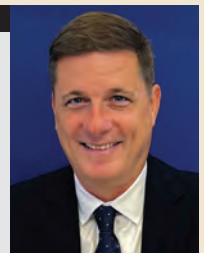
Greensea IQ's roadmap is closely aligned with this future: expanding the reach of services, supporting next-generation inspection and monitoring tools with remote operation capability, and enabling real-time edge processing for decision-making from shore-based command centers.

The industry doesn't just need cleaner ships, it also needs smarter solutions. Solutions that understand the environment, respond to evolving demands, and deliver efficiency without compromise. From reducing fuel burn and emissions to improving the longevity of coatings and reducing operational risk, Greensea IQ is helping maritime operators chart a course where sustainability is built in.

The Author

Howard

Rob Howard, Chief Growth Officer at Greensea IQ, has over two decades of experience driving revenue and growth in international maritime, defense, and underwater technology markets.



Unlocking Capital from Goods on the Move Through In-Transit Freight Financing

By J. Philip Nester, Benesch Law

Recent history demonstrates just how unpredictable global supply chains can be, where delays, disruptions and prolonged transit times create substantial capital constraints for businesses. In-transit financing can address these challenges by converting goods enroute into liquidity that enables businesses to sustain operations and pursue growth without interruption.

By combining negotiable bills of lading, structured credit arrangements and seasoned lending partners, businesses can turn shipments into strategic financial assets that scale with confidence and strengthen resilience against supply chain uncertainties. In today's interconnected and often unpredictable global trade environment, in-transit financing is more than a source of capital – it is a strategic tool businesses can use to sustain operations, navigate risk and build long-term resilience.

Converting Goods in Motion into Working Capital

Global supply chains are longer, more complex and increasingly unpredictable. For businesses managing shipments that might be in transit for weeks, waiting for inventory to arrive before accessing capital can create significant cash flow pressures. Traditional financing structures through lines of credit, loans or receivables often fail to align with transportation and logistics' operational realities. In-transit freight finance can address this gap and enable businesses to leverage inventories while enroute, thereby preserving liquidity and supporting uninterrupted operations from origin to destination.

What Is In-Transit Freight Finance?

In-transit freight finance is a short-term working capital solution that allows companies to draw on the value of inventory before reaching a consignee, warehouse or distribution center. By converting shipments that are in-transit into financial assets, businesses can bridge the period between the purchase and delivery of those cargoes. This financing tool is particularly relevant for enterprises that have long lead times, high-volume imports or demand-driven inventory cycles. Unlocking liquidity that is tied to goods that are in-transit, this financing tool allows businesses to pay their suppliers, manage costs associate with duties and tariffs, and maintain

operational continuity without waiting for the cargo to arrive at their intended destination. In this way, in-transit freight financing transforms inventory from a cash-intensive asset into a resource that supports working capital needs of the business.

How In-Transit Financing Works

In-transit financing is structured to move in step with the supply chain. Once goods depart from a supplier or a port, a financing partner assesses the shipment value in order to establish a borrowing base. In some cases, the base can be combined with accounts receivable to create a flexible line of credit. Funding will be extended upfront to give the shipper the ability to cover operational costs or manage concurrent shipments while the goods remain in transit. Repayment of the extended credit is timed with the delivery or sale of the goods, which minimizes operational strain while protecting the lender's collateral.

Important to this process is a negotiable master bill of lading ("MBL"). When issued "To the Order of" a lender or a designated agent, the MBL operates as a negotiable instrument that grants enforceable rights to the cargo. By contrast, house bills of lading ("HBLs") are often non-negotiable and issued to the shipper, which limits their utility to secure in-transit financing. Proper coordination of service providers' HBLs and MBLs, combined with tripartite agreements involving carriers, forwarders, warehouses and customs brokers, ensures the in-transit lender's rights are recognized while maintaining the uninterrupted flow of goods.

The Role of Specialty Lenders

Businesses that produce high-value goods or a high-volume of shipments across complex supply chains stand to benefit. Sectors such as retail, consumer goods, electronics and the automotive industry, as well as companies navigating seasonal stock builds, just-in-time inventory models or unexpected delays, can use in-transit financing to preserve liquidity and maintain operational momentum. Partnering with a specialty lender is a critical component of an effective in-transit financing strategy. Experienced lenders structure solutions that account for multi-modal transportation, fluctuating delivery schedules and cross-border regulatory obligations. These lenders can deliver scalable funding, responsive approval pro-

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cesses and flexible repayment terms, while preserving a business' existing credit structure.

Navigating Supply Chain Disruptions

Recent supply chain disruptions stress the practical importance of in-transit financing. For example, geopolitical tensions in the Middle East and Houthi attacks on vessels in the Red Sea have forced the steamship lines to reroute around Africa, which have substantially increased transit times. Similarly, additional pressures due to port congestion, rising cargo volumes, severe weather, climate events, labor shortages, slow steaming rules and container scarcity create delays that immobilize working capital.

In-transit financing addresses these challenges by transforming goods that are already in-transit into liquid assets, enabling companies to sustain operations despite market uncertainties. By freeing up cash tied in shipments and inventory, businesses can maintain liquidity and reduce balance-sheet strain to support supply chain resilience through extended payment terms and improved cash-flow timing. This approach is especially important as businesses navigate seasonal slowdowns and factors affecting global trade to enhance financial agility without increasing debt.

Key Advantages

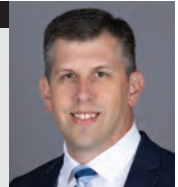
In-transit financing provides a number of operational and financial benefits:

- **Improved Liquidity:** Access capital tied to inventory before it reaches its final destination.
- **Supply Chain Continuity:** Maintain operations despite extended lead times or supply chain delays.
- **Operational Alignment:** Funding can track actual shipment and inventory cycles.
- **Existing Credit:** Financing works alongside existing credit facilities.
- **Quick Access to Capital:** Approvals are based on the value of the goods in-transit.
- **Global Trade Support:** Businesses can manage international shipments that have longer transit windows.

The Author

Nester

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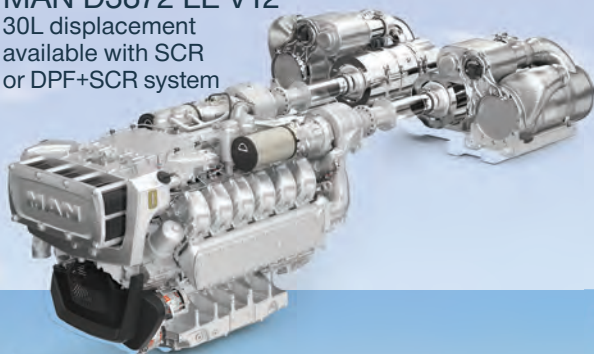
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LOOKING BEYOND *MARITIME'S "MOMENT"*

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

It's been said that American maritime is "having a moment" in Washington, DC. From President Trump's Executive Order on Restoring America's Maritime Dominance, to introduction of the bipartisan, bicameral SHIPS for America Act in Congress, the U.S. maritime industry has been a subject of focused attention at the highest levels of government, and rightfully so. At their core, these initiatives are driven by recognition that a strong maritime industry is not only vital to the American economy, but also fundamental to our national security, particularly as China continues its rapid maritime expansion to further its own geopolitical ambitions.

Add to that the Trump administration's goal of unleashing the American economy by streamlining regulatory burdens, and it all adds up to a real convergence of opportunity for the domestic maritime industry.

In this environment – as the tugboat, towboat and barge industry's advocate, resource, and united voice for safe, sustainable and efficient transportation on America's waterways, oceans and coasts – AWO is working hard to ensure that our nation's reinvigorated commitment to a robust American maritime industry endures beyond a single "moment," and is not limited to what happens in DC. We need to translate this renewed focus into tangible action that will strengthen our industry and enable us to continue advancing vital national interests for generations to come.

That starts with continuing to fortify and expand longstanding, bipartisan support for the Jones Act, the statutory foundation of American maritime. At a time when policymakers are able to agree on precious little else, today's widespread support for the Jones Act reflects commonsense understanding of its importance to our national security, economic resilience,

safety and environmental quality. But, the law's perennial critics – from the opportunistic to the uninformed – are persistent, and we can't afford to be complacent.

At the federal level, we need to build on that foundation by promoting policies and investments that enhance safety, efficiency and innovation – by working with the Coast Guard to ensure a practical and consistent approach to Subchapter M enforcement; securing timely issuance of Coast Guard regulations implementing the Vessel Incidental Discharge Act to replace the unworkable patchwork of federal and state regulation that has plagued our industry for two decades; advancing legislation that ensures engine room watchstanding standards keep pace with technological innovations onboard ATBs; protecting navigational safety through policies that keep commerce moving safely through low and high water on the Mississippi River, fund modernization of waterways infrastructure, prevent dam breaching on the Columbia-Snake River, and establish safe navigation fairways on the Atlantic and Pacific coasts; and much more.

We must also take our advocacy to the states, where policy-making can be equally consequential to the safe and efficient movement of maritime commerce. In California, an industry coalition recently convinced the state to drop a draconian Indirect Source Rule that could have shut down our nation's busiest ports in favor of a cooperative agreement between the ports and state regulators, but we must continue to work with the California Air Resources Board to implement its Commercial Harbor Craft rule in ways that protect mariner safety and embrace practicable timelines for compliance.

Whether we are working to ensure sensible emissions frameworks in California, educating legislators in Illinois and Missouri on the impact of mandatory paid leave requirements on vessel

operations, opposing excessive operational taxes in Washington state, or building on our successes in countering anti-Jones Act resolutions in Alaska and New Hampshire, effective advocacy in state capitals is critical to creating the conditions for the continued safety and efficiency of maritime commerce.

Translating a maritime “moment” into a strong and enduring future also means continuously improving our performance as the indispensable national asset we are, especially by building on our unmatched record as America’s safest mode of freight transportation. The Coast Guard-AWO Quality Partnership – at 30 years and counting, the Coast Guard’s oldest public-private partnership – has been the cornerstone of this effort, with the partnership’s most recent Annual Safety Report showing continuing positive trends in driving down fatalities (at 4.2 per 100,000 full-time employees in 2024, well below the rate for all transportation workers) and oil pollution (.25 gallons per million gallons of cargo transported by tank barge in 2024, with 92% of the total volume traceable to just two incidents). Improvements like these don’t just happen – they are the result of a strong safety culture across our industry, and forward-thinking leadership in addressing both longstanding and emerging safety risks. That is why AWO’s latest efforts to pre-

vent falls overboard through our Falls Overboard Prevention Report; collaborate with the National Safe Boating Council to educate recreational boaters on safe navigation near commercial vessels; address moveable bridge hazards through our Bridge Event Reporting program; and other initiatives are critical to continued progress toward zero harm.

If American maritime is to continue to thrive beyond any given “moment,” we must also attract, retain and grow the industry’s future workforce to meet growing demand for marine transportation. There is no single solution to this challenge, but it certainly requires modernizing the Coast Guard’s mariner credentialing process, so we don’t lose mariners to frustration with long bureaucratic delays; cultivating partnerships between our industry, federal and state maritime academies and educational and training institutions around the country; and finding innovative, engaging ways to tell our industry’s compelling story to the next generation of mariners.

That American maritime story is more than a moment – it’s a central pillar of our nation’s past, present, and future prosperity and security. Working together, the American maritime community must seize today’s opportunities to build the industry that our country needs for a strong tomorrow.



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ATDM

DEVELOPPING SKILLED WORKERS TO HELP RECHARGE THE UNITED STATES MARITIME INDUSTRIAL BASE

The U.S. Navy needs to dramatically increase the fleet, especially submarines, but the available pool of skilled workers is not keeping pace.

By Edward Lundquist

Submarine construction is ramping up. The Navy continues to build Virginia-class submarines, striving for two per year, and is gearing up to build the new Columbia-class of nuclear-powered ballistic missile submarines. At the same time, the industry needs to support the ambitious Australia-U.S.-U.K. AUKUS program to make the Royal Australian Navy a nuclear submarine navy.

Qualified workers are not only needed to build submarines, but all types of ships for the Navy. Government and commercial shipyards involving naval ship construction and repair have a variety of apprentice programs, internships and partnerships with trade and vocational schools to develop potential employees. Shipbuilding is not alone in the manufacturing sector in regards to a heavy demand signal for skilled workers in a declining pool of qualified candidates.

The Navy has invested in “Build Submarines,” a website that provides career information and job opportunities to find and recruit qualified people, and offer job skill training programs.

While the impetus has been the submarine industrial base (SIB), the Navy widened the aperture and established the Maritime Industrial Base (MIB) program office because a lot of what the service was doing for the SIB was also beneficial to the surface domain, and in fact, many aspects of defense manufacturing.

A shining success story is the Accelerated Training in Defense Manufacturing (ATDM) program. ATDM was established under the direction of the Navy’s Maritime Industrial Base Program to train the future workforce and operationalize an innovation

hub for advanced manufacturing, and is run by the Institute for Advanced Learning and Research (IALR) in Danville, Va.

Danville was once a thriving mill town and the primary tobacco market of Virginia; it is located in the Southern Virginia region, also once known for producing furniture. As these industries declined, the community leaders decided to make the area a hub for tech industries and training. The plan is working, as companies are coming to Danville because of the availability of people who are coming through the myriad of tech and manufacturing training programs available in the area. This attracted the Navy to work with IALR to create the ATDM program.

ATDM offers an intensive 16-week course in five different tracks – welding; computer numerical control (CNC) machining; additive manufacturing; non-destructive testing; and quality control inspection (metrology). These are the skills that are in extremely high demand by shipyards and their partners and suppliers. The need for workers with these skills is not confined to the Navy and defense industry, but mirror the acute need for people with this knowledge and ability throughout manufacturing today.

“We are a workforce training program funded by the U.S. Navy to reduce time to talent for the maritime industrial base—specifically the trades,” said Jason Wells, executive vice president of manufacturing advancement for IALR. “We’re focused on the maritime industry manufacturers that work in subs, aircraft carriers and the entire spectrum of naval architecture and design, repair and shipbuilding.

The ATDM program is designed to efficiently train qualified candidates in essential manufacturing skills and trades to

The background of the advertisement is a dark, industrial scene with a blue color palette. A robotic arm is positioned at the top, with a bright blue laser or welding beam focused on a large, curved metal part. The beam creates a bright, starburst-like light at the point of contact. The overall atmosphere is high-tech and precise.

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– Acting Chief of Naval Operations Adm. Jim Kilby



establish a steady and sustainable flow of qualified workers for the naval shipbuilding and repair sector of the maritime industrial base. These workers graduate with more than an industry-recognized credential; they leave with experience specific to the maritime industrial base, minimizing training time once they get to the job floor.

According to ATDM’s promotional material aimed at employers, “We can take new hires, regardless of experience, and train them to SIB certification status in less time, for less money than anyone else — most students qualify for full scholarships for tuition and housing. We can do this in months, not years.”

Training Around the Clock

According to Wells, the on-site training program is conducted at an accelerated rate. “A student that comes to our program lives in Danville for four months. They complete 600 hours of training over the 16 weeks, which is equivalent to one year in an accredited career studies certificate program. So, it’s a very intensive, hands-on training experience.”

Wells said the rigorous courses are not for everybody. “We tend to be a really good fit for mature learners who have been in the workforce for a while and want to up-skill themselves, or who are looking for a new career. Transitioning military who want to continue serving their country in their new veteran role have also done well in ATDM.”

To qualify, a candidate must pass background and drug screenings and achieve a qualifying score on the Testlify Assessment, a tool used to evaluate applicant readiness and ensure they have the skills needed to succeed in our fast-paced, hands-on training programs.

“Our goal is to ensure that each student is positioned to thrive in a classroom that mirrors real workforce demands,” said Joyce Cully, ATDM’s Assistant Director for Recruitment and Admissions. “Part of our success lies in our ability to identify the students best suited to this type of program and skill them up quickly so they’re ready for employment.”

According to Cheryl Terry, the senior director of program support services, there are several different pathways for stu-

dents. A company can send an employee to learn a new skill and earn the necessary certifications; a candidate can agree to work for an employer as soon as the training is complete; or a candidate can attend the course and meet prospective employers at the job fairs held during the 16-week program.

“We have our students with us, eight hours a day, five days a week. A traditional welding program will take two years, with a variety of coursework. We’re focused. For example, in our welding program, you’re going to spend the vast majority of the time in a welding booth, on your own machine, learning how to weld,” said Terry.

Each class has 12 students. For every 12 students, there’s one instructor and one technician. Because welding and CNC machining are in high demand, these courses are conducted in three shifts.

“We’re training around the clock,” Terry said.

To ensure the training matches what employers require, Terry said ATDM stays tapped into the industry, and is responsive to industry needs. ATDM has a good understanding of the shipbuilding enterprise, including large trade organizations like the Marine Machinery Association (MMA) and the Submarine Industrial Base Coalition.

“We have the advantage of being flexible,” she said. “For example, the welding program has been modified to teach fabrication in confined spaces like one would encounter on a ship, where they have to weld out of position.”

Terry said the students arrive motivated to learn. A small percentage of the students already have jobs, and those tend to be some of the better students. Although the students are responsible for travel expenses to and from Danville, the tuition and housing (for non-local students) are paid for by the Navy. “Everyone is on scholarship here.”

Creating a Culture

The program has a code of conduct, and there are attendance and academic performance expectations. “We want them to view this as an important job and an investment by the nation. We’re creating a culture where both our staff and our students

realize the importance of the work that we do, because it's important work for the defense of our country," said Terry.

"During orientation, we tell them it's going to be hard, but to view it as a short-term sacrifice. You buckle down, you work hard for four months, and there's going to be a great reward at the end," she said.

There is a required industry engagement course, and participation in the job fairs is required unless a student has already received an employment commitment.

According to Terry, the industry engagement class is as important as any of the welding, machining or metrology classes that those students will take. "It teaches them how to apply for jobs, making sure they're looking for a job early on, how to dress, how to talk, and when to toot their own horn."

The career services team helps students create resumes and conducts mock job interviews.

As these students take up their jobs, they help build and maintain the ATDM brand. "If companies need to hire additional people, and they've got an ATDM graduate who they're pleased with, they'll come back to us. That reputation we have to maintain."

There are jobs available in all 50 states, but the bulk of the jobs are in or around the major shipyards. A number of companies participate in the job fairs, but students are not limited to those companies. If a student is reluctant to accept an offer, it's usually because they don't want to relocate. When they compete for the scholarship, they know going in that the jobs may not be in their hometown.

"There's an expectation that they will work somewhere in the submarine or defense industrial base for a year. We're hoping that they're going to get their foot in the door and stay there and move up," Terry said.

While the "Build Submarines" advertising and outreach is effective, Joyce Culley, ATDM's assistant director for Recruitment and Admissions said the program also actively seeks out candidates.

"We have a veteran recruiter that spends a lot of time on the road visiting military bases and attending programs sponsored by the military to get veterans here to the program. We also have other recruiters that go to college fairs and career and technical education outreach events to talk to people about our program face-to-face," Culley said.

"When they're not on the road, our recruiters reach out by making phone calls," she said. "We also have work-study students contact leads and prospects to share information with them about the program. They come in after shift and work several hours making calls for us."

Culley said that there have been students from 46 different states, and they have had job opportunities from employers across the nation. But, she said, students need to be open to relocating to where there are vacancies with companies participating in the MIB.

Demand for the five different tracks varies. The AM course is offered three times a year. But in welding and CNC, there are new cohorts starting regularly, and the training is being conducted in three shifts. Additive manufacturing and metrology will expand to two shifts this fall.

The curriculum is constantly being updated, Culley said.

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“What we teach in the first AM course of the year will be different than the third, because the technology is changing. When students show up, they’re can be assured they’re getting the latest and greatest.”

Culley said the acceptance rate is high because most of the candidates have work experience and understand the ATDM value proposition. “We normally accept about 90% of our applicants. We are constantly revisiting our admissions process to ensure we’re getting the ideal student. About 30% of our students are veterans. They’re usually open to moving to a new job. Many of them have roots in areas near military bases, and there are usually defense industry jobs near those bases. We have online information sessions, so after they complete the application and the Wonderlic assessment, we go over requirements for the program,” said Terry. “We cover the five program areas to make sure candidates choose the right program, and we talk about the Danville area, what to expect when you get here to Danville, what you need and don’t need to bring with you. After the information session, and they’ve heard everything about ATDM, we schedule a virtual interview, and give the candidate the opportunity to tell us why they’re best suited for our program.” Students do receive certifications which are recognized everywhere, although achieving certifications requires initiative on the part of the student. “These are good jobs with room for advancement and growth,” Culley said, “But the students are gaining entry-level skills, and should expect entry-level salaries at the beginning.”

Reduce Time to Talent

ATDM’s Director of Cross-Functional Initiatives Karen Hardy reviews feedback to improve the curriculum.

“We reach out to students and employers to evaluate success at the 60-day mark and at one year,” Hardy said. “The program’s only been in existence since June of 2021, so we’re now just starting to get the data we need to make some definitive conclusions. Our objective is to reduce time to talent.”

As industry sees the success, the participation is growing. Hardy said her team has a good understanding of the shipbuilding enterprise, including large trade organizations like the Marine Machinery Association (MMA) and the Submarine Industrial Base Council.

“We try to conduct at least five career fairs a year for our students, and we typically have 25 to 35 companies that participate in them, plus more than 180 companies that are otherwise engaged with our program. In addition, we have been in communication with up to at least 450 to 500 companies at this point,” she said.

Companies also have the option to come to Danville in person to interview or present to students, even outside of the career fair days.

Balancing Hard and Soft Skills

“I’ve toured training providers around the nation, and they have great programs, but the one thing that Danville gets right is

understanding the value of balancing soft skills with hard skills; understanding how to wrap around disciplines and understanding the dynamic that happens inside manufacturing. Because teaching skills is one thing,” IALR’s Wells said. “You can teach skills, but character is a whole other thing, and they do a really excellent job in the community of developing character.”

Wells said ATDM is a five-year pilot program. “Currently, we’re in a prototype phase. Our goal is to reach full operational capacity and produce 800 to 1,000 students a year. And there is a very high likelihood you will see another ATDM on the West Coast, or elsewhere in the U.S.”

ATDM programs offer a variety of industry-recognized credentials. But Wells said the extent that students earn those certifications is based on student initiative.

ATDM has an Advisory Council made up of industry members that drive a lot of the program’s behaviors

“We continue to modify the curriculum and grow it to be more and more impactful, but we do very much try to stay away from being monopolized by one particular end,” Wells said.

It would, however, be possible to create a cohort for a single customer that focuses on their systems and procedures, Wells said.

“We have one particular industry partner that agreed to fill an entire cohort of 12 students,” said Wells. “We will be doing a modified welding program just for their needs.”

Wells said companies often have to contend with the availability of trained workers at traditional graduation times at the end of the academic year. But ATDM is graduating students every eight weeks. “If an employer needs a couple of welders or machinists right now, we have a graduation coming up with qualified people ready to hire.”

We get transitioning military people who need a skill for the next stage of their lives. Some students are “conditional hires,” where an employer identifies someone to work for their company, and sends them to ATDM to acquire basic skills. Others who already have jobs and are doing well, but their employer needs people in skilled trades, and they send them to ATDM to “upskill.”

Wells said the program can be life-changing. “Our students can go from a fast-food job to making \$50,000 to \$70,000 a year with job security after completing our 16-week program.”

Motivated Students

Jarrod Hankins is the instructor for ATDM’s Quality Control Inspection (Metrology) course. He’s a graduate of the program, and later was offered a job to teach the course.

“I tell each one of my students that, number one, I’m here to try to get people into the workforce,” he said.

“I’ve got students from 18-year-olds who are right out of high school to 72-year-olds who want to learn something new. All of them want to be here,” Hankins said. “Some students may have had a hard time connecting with the right job opportunity in the past, but the companies know what we teach, and they come here because they need people with these skills. I see my students at the job fair handing out their resumes to 30-plus companies that are eager and ready to hire.”

Hankins said companies come to the ATDM job fairs because they know that the students are motivated and qualified. “They’re here because they want to be; already had a background check; have a known set of skills, and maybe some certifications; and are available to work. That saves them a lot of trouble and expense from advertising and just going to job fairs where you have no idea who’s walking up to you.”

“We’re teaching a skilled trade,” said Hankins. “But we also teach honesty and integrity. The work our graduates will be doing may involve a multi-million-dollar component that has several people’s lives at stake. That’s why I try to instill the importance of what they’re doing into all of my students.”

One of Hankins’ students is Ryan Jannuzzi. He comes from a Navy family. His father was a sonar technician on a Navy destroyer, and his brother is currently flying F/A-18 Super Hornets. He saw ATDM as a way to serve.

What got Jannuzzi interested in ATDM was the “Build Submarines” NASCAR sponsorship of Brad Keselowski’s No. 6 Ford. “I was looking for a career change, and I liked the idea of a job with a higher purpose,” said the Pittstown, N.J. native.

“You get all the hands-on training and experience you could ask for,” said Jannuzzi. “It’s just a phenomenal program, and it’s free.”

Jannuzzi has accepted a job at a manufacturing company in Pennsylvania involved in energy, oil and gas, as well as in aerospace. “I’ll be working as a calibration and quality specialist role for them,” he said. “I found the job online through Build Submarines.” Jannuzzi knows that his job will be important, ensuring that very exact standards are met. “Submarines have the highest standards of all.”

A National Movement

ATDM holds an annual summit to bring the Navy and industry together to ensure the education and training process is meeting expectations. The most recent summit was held in March. Employers can provide feedback on the curriculum to ensure the training addresses the latest skills and certifications needed by their companies.

Acting Chief of Naval Operations Adm. Jim Kilby attended the ATDM Annual Summit in Danville, in April, and delivered the keynote address. He underscored the importance of ATDM to the Navy.

“I can assure you that ATDM is contributing to a national movement that is making America stronger, safer, and more secure,” Kilby told the attendees. “The work you’re doing matters to our military, our economy, and the future of this country.”

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SHIPBUILDING

HOW LIFE EXTENSION AND CONVERSION REDEFINES

“BORN AGAIN” IN U.S. SHIP REPAIR

By Bob Kunkel, Amtech

All images courtesy Amtech

We are well into the discussions advising shipbuilders and operators how the U.S. will create a renaissance of the maritime industry. Federal Legislation, Executive Orders, and new foreign partnerships driving the promise of commercial competitiveness with the leading global shipbuilders. Most of the shipbuilding rhetoric indicates the domestic markets will be left to survive on their own. This despite the fact the domestic operators and builders have proven to be the strongest undercurrent to decisions and amendments on the legislation efforts.

It is year-end here at Maritime Reporter & Engineering News. With that gathering of actual shipbuilders and operators comes the end of the political storytelling and the announcements of who is building and who is not. In our opinion 2026 will fall into who is not as the geopolitical rhetoric continues. Unfortunately, the problem is not the builders, not the owners or managers and in some cases not the markets. It is just mass political confusion of what direction the industry is going to take and how we build a supply chain or manufacturing base to support and meet the White House goals. Life extension and conversion to existing tonnage in our repair yards can educate the political leaders on how to solve the problems.

Year End: The Storm Looms

Let's concentrate on the home front and the domestic projects developing beyond the stories of new construction shipyards competing for Navy and USCG work now coupled with new foreign partners promising global competitiveness. We are still asking where is the support of our commercial fleet and most look to lucrative Navy contract.

Domestic trading opportunities are developing as historical clean and dirty petroleum products are slowly accompanied by chemical and gas. In the chemical markets few if any of the existing domestic barges are capable of transporting new bio fuels, chemicals and or base products. The Cargo Authority approvals can range between confirming proper cargo tank coatings, stainless steel cargo systems, cargo pump capability and IBC code requirements. Despite the now "one-year delay" in meeting the IMO MEPC net zero wish list, new cargoes will continue to develop.

Despite the MEPC vote to delay the position on carbon tax and emissions, the foreign tonnage entering the U.S. coasts will require new bunkering sources to address alternative fuels. With that necessity, coastwise registered domestic vessels will need to distribute these cargoes from one U.S. port to another. With our lessons learned identifying the U.S. manufacturing base and supply chain is one of the lead problems with our shipbuilding growth, there are other commodities that will also increase in demand globally and can move to rebuild U.S. infrastructure and manufacturing.

Hopefully the geopolitical discussions in our government de-

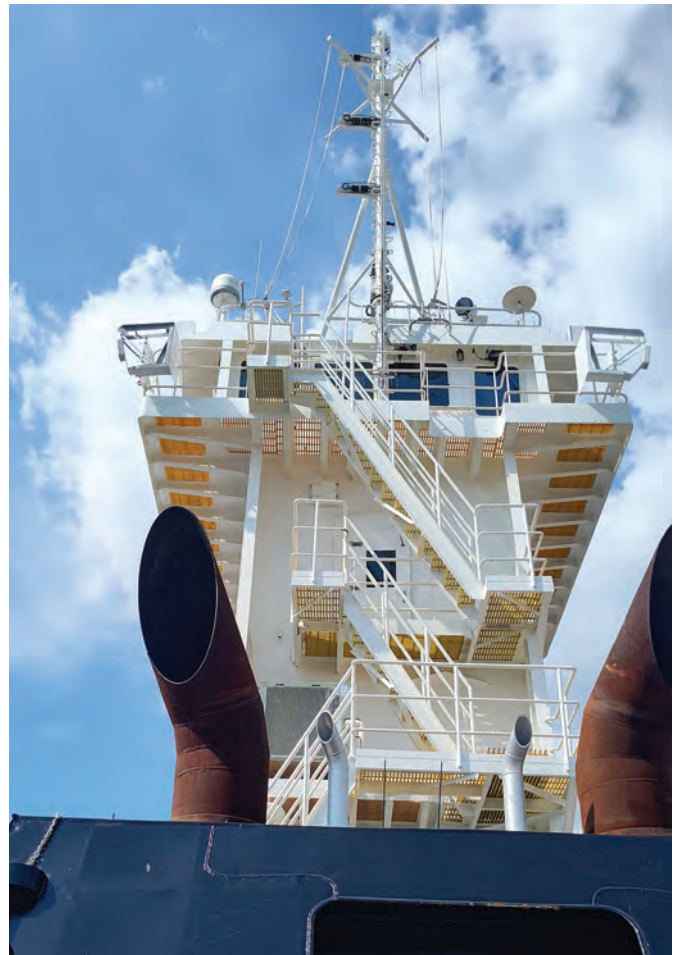
partments will wake up to the fact that Gaza needs to be rebuilt and at some point, Ukraine. With that wakeup call, new legislation to support the effort and demand U.S. material be required, can work towards agreements that these goods will be delivered to on new U.S. Flag tonnage. Not an absurd request considering the cost of military equipment and funding the U.S. has provided to both regions. Russia has a ghost fleet, with tariffs and taxes, the global trading patterns are changing and U.S. maritime needs to step to the front of the line with support of our Navy.

LNG has been addressed with capable bunkering tonnage provided. A move to Ammonia, Hydrogen, Methanol or the simplest of alternative fuels in the U.S. fleet has not. Make no mistake, there is no domestic customer base to build or charter new "Bluewater" ship tonnage at the current prices estimated to build that tonnage. The commercial trading markets can't absorb both the construction Capex and the full crew compliment of US ship operation. To support our domestic markets, we turn to tug & barge in an attempt to solve both of those problems.

None of this should be a surprise.

ATBs: The Future Domestic Coastwise Fleet

The purpose of the Articulated Tug & Barge design developed in 1950 and further advanced in the 1970's and 1980's





was to provide additional operational performance beyond historic tug tow line. In 1981, the USCG recognizing the ATB safety advantages and created new regulatory amendments that affected crew size and inspection criteria.

Make no mistake, with new ship construction current price levels, the ATB is our future domestic coastwise fleet. The next steps should be the continued pursuit to elevate designs and work towards becoming more efficient in ATB construction. It is not only “Bluewater” costs that are rising. It is also “Brownwater”. And with that, we are seeing a transition period develop with projects addressing life extension and conversion of existing ATB tonnage while the cargo priorities shift from historical petroleum products to a new set of commodities in wet markets.

AMTECH developed an ATB life extension and conversion project in mid-2024 with Marathon Asset Management of New York and Gulf Marine Repair in Tampa, Florida. The business model included the purchase of an existing 155,000-barrel petroleum barge and Articulated Tug along with a design proposal to convert the vessel to trade soft chemicals. The selected tonnage was idle in layup and eighteen years of age when purchased. A 15-year life extension was targeted for the reconstruction.

The business model was developed based upon the purchase of existing tonnage and conversion compared to the estimated cost of new construction. Cost estimates were provided by several U.S. yards. The selection of life extension and conversion resulted in a greater than 60% reduction in the asset capital cost when delivered.

The project development took into account every shipbuilding issue debated in Washington, DC circles over the past 12 months and with that a “lessons learned” of what our actual “shipbuilding” problems are were well defined. It is an underdeveloped manufacturing base and a supply chain of near

zero. We still need foreign support from our allies.

Three hundred and twenty tons of steel were renewed after extensive gauging and survey. All of the steel was renewed in a U.S. shipyard with U.S. labor. In the logistics category, the purchase and delivery of steel was identified as a major problem and most was delivered from foreign sources despite a request that no Chinese steel be supplied. A complete redesign of the cargo piping system was completed in 316 stainless steel. Stainless pipe, fittings and valves were near nonexistent in U.S. inventory. The supply chain delivery quotes in these categories were 18 to 30 weeks. If purchased foreign, extended delays exist to request of Imperial standards versus global metric.

Cargo tanks reconstruction was specifically targeted to support an investment with Advanced Polymer Marine Line tank coatings to allow the carriage of new cargoes. This is the first U.S tank barge project applied with Marine Line in the United States to support the commercial and trading applications. Anchor Sandblasting & Coating of Tampa agreed to take on the project and our Amtech South Korea teams provided previous coating experience from our new construction contracts in Hyundai. Anchor Sandblasting & Coating attended shipyards in Turkey to complete the training and take part in coating repairs during the attendance. The selection of Marine Line was an important part of the conversion. The polymer coating provides superior resistance to corrosion and wear, a faster cleaning surface and upgrades to cargo sequencing.

Our Korean teams could not obtain Visa(s) under current immigration issues in the U.S. If U.S shipbuilding is determined to partner and learn from the Far East global shipbuilding powerhouses – H1 Visa approval for professional engineers, trainers and educators is paramount for the advancement of new technologies applied in the Far East.

The project did not experience a lack of labor at Gulf Marine. When schedule advances were required, additional labor was made available. The quality of the work we inspected and approved in near every trade was well above satisfactory. The American shipyard worker can do the job and the Port of Tampa continues to be “shipbuilding” supportive.

Each piece of machinery on both tug and barge was dismantled, inspected and rebuilt and/or upgraded when the existing suppliers could not confirm spare part sustainability into the fifteen-year life extension. The media reports of labor issues have not taken into account the large number of small business repair shops completing overhauls, licensed by the major manufacturers and providing auxiliary equipment and manpower throughout the repair industry. This is the representation and value of the American entrepreneurial spirit and the support those of us on the deck plates are thankful for each day. The project is working through commissioning and will sea trial shortly prior to entering the market.

All of the efforts move towards rebuilding Maritime Supremacy – global or domestic.

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The 4th generation family run business J.F. Brennan Company (Brennan) is a waterborne marine construction powerhouse, born more than 100 years ago in the Upper Midwest, and evolving into a multi-dimensional, national marine infrastructure leader. **Matt Binsfeld, President & CEO of Brennan**, and his three brothers operate the business today. Binsfeld recently sat down with Maritime Matters: The MarineLink Podcast to take a deep dive into the company, its rich history which was started in 1919 pouring concrete floors for local barns, with insights on a multitude of complex engineering construction and environmental mitigation projects, with a and promising future.

By Greg Trauthwein

When Matt Binsfeld talks about J.F. Brennan Company, he doesn't speak as a detached executive. He speaks as someone who's been living the company's story since he was 10 years old — literally. His first paid job was sorting bolts by the piece, and he still remembers the motivation that came from being paid for every handful he finished. "I think my first job here was sorting bolts when I was nine or ten years old and getting paid by the piece," he laughs. "I was being motivated to have high productivity."

That work ethic — the willingness to get your hands dirty, to learn the business from the bottom up — still shapes Bren-

nan today, more than a century after the company was founded. "When you're in a family business," Binsfeld says, "you grow up around not only the business but the industry."

Today, Matt and his three brothers lead a fourth-generation family enterprise that has grown from a small Midwestern contracting outfit into one of the nation's most diversified marine infrastructure specialists. With more than \$300 million in annual revenue, a fleet of \$100 million in equipment, and a workforce of roughly 800 people deployed from coast to coast — and into Canada — Brennan has become synonymous with complex marine and environmental work across North America.

“We’ve been an acquirer of underwater service type companies. What we see is a lot of the Baby Boom generation are getting to the end of their working careers ... and their next generation may not be fully formed or even interested in getting into the business. My brothers and I are all in our 40s, and we’ve been a strategic buyer of underwater service businesses that we can plug in and leverage across to grow our own business.”

– Matt Binsfeld, President & CEO, J.F. Brennan Company

A Century on the Water

The story began in 1919, when two brothers, Jim and Gene Brennan, found themselves as the fourth and fifth sons on a family farm near Lansing, Iowa — with no spot for them in the family business. “There was no spot for them on the family farm,” Binsfeld explains. “So they started a small contracting business.”

Their earliest jobs were humble: pouring concrete barn floors for local farmers. But that work taught them the basics of construction, and soon they were building homes, working on railroads, and taking on small commercial projects. As the nation’s infrastructure expanded and the U.S. Army Corps of Engineers began constructing locks and dams on the Upper Mississippi, the Brennans saw an opportunity.

“In the 1950s,” says Binsfeld, “Jim and Gene made the decision to focus on waterborne construction — and that was a seminal turning point in the direction of the business.”

The company’s second generation carried that momentum forward, expanding into steel fabrication and other complementary trades, but always keeping one foot in the water. The successful transfer of ownership from one generation to the next — a noto-

riously difficult process in family firms — became a foundational part of the company’s culture. “That first generational handoff set expectations around how transition would work,” Binsfeld notes, “and those expectations still carry through today.”

In the 1980s, under Matt’s father’s leadership, the company diversified again — this time into hydraulic dredging and harbor services, establishing business lines that continue to anchor the company. “Those were key moves,” he says. “Hydraulic dredging led directly to what is now our environmental division, and the harbor services side became a permanent part of our identity on the Mississippi.”

Mississippi River to the Nation

By the early 2000s, the Binsfeld brothers had each followed the same playbook their father demanded: start as a yard hand, work for someone else, then come home. “We call it being a ‘yard dog’ — cleaning engines, doing the dirty work, understanding the business from the base up,” Matt explains. “You go to school, get an engineering degree, go work for the competition, earn an MBA, and if your résumé is attractive enough, you get rehired.”



1893 to 1918

Two grandsons of an Irish immigrant grow up on a family homestead outside Lansing, IA. With entrepreneurship in their blood from birth, they complete 8th grade and begin an informal partnership pouring concrete floors in milk barns, threshing oats, and operating a sawmill. Locally, they become known as the Brennan Brothers.



1919

Jim and Gene decide to formalize their working relationship and begin a contracting company called Brennan Brothers Construction. For their first project, they build a small county bridge near Wexford, IA; they charge \$97 for the job. Their initial work equipment consisted of an old Ford Model T pickup truck and a couple of shovels.



1930s

During the Great Depression, Jim and Gene continue to grow their business by traveling further from home. They pursue work outside of Allamakee County; it takes them several hours to travel to job sites by car. Crews camp in canvas tents during the week, returning home on weekends to manage their farms. The brothers hire a full-time cook who makes all their meals and guards the food supply against the many migrant workers traveling the country by train, looking for work.



1937

Jim Brennan's wife, Kathryn, passes away. The company takes on a particularly challenging project in Argyle, WI, building a bridge across the Pecatonica River. Difficulty dewatering the cofferdam for the pier nearly puts the company under.

MARINE CONSTRUCTION



By the Numbers: Brennan at a Glance

Founded:	1919
Annual Revenue:	\$300+ million
Employees:	~800 (at peak season)
Equipment Fleet Value:	\$100+ million
Divers:	~100 working daily across North America
Geographic Reach:	"Coast to coast to coast" — the U.S. and Canada
Reinvestment:	Eight figures annually into people, assets, and systems

A Multi-Dimensional Business

Today, J.F. Brennan operates through five primary business groups, each contributing to a diversified yet integrated portfolio:

Marine Construction –	~30% of business
Environmental Services –	~30%
Underwater Services –	~20%
Power & Cable Services –	~15%
Harbor Services (Fleeting) –	~5–7%

That disciplined approach has paid off.

When the brothers returned to La Crosse, Wisconsin, they brought fresh ideas and outside experience that fueled Brennan's evolution into a national powerhouse.

"In the last 15 to 20 years, we've taken this business from one focused in the Upper Midwest to one that's operating throughout virtually every state in the U.S. and into Canada," Binsfeld says. "It's been a tremendous story of not just family transition, but of attracting incredible people who share our mission."

Brennan's motto — "In, above, adjacent, and below the water" — now describes an operation that works in every imaginable aquatic environment. The company's nearly 100 commercial divers operate daily across North America, supported by a deep bench of engineers, project managers, and

craftsmen who specialize in everything from heavy marine construction to complex environmental remediation.

"Our environmental and construction groups are our bread and butter," says Binsfeld. "Marine construction is where we started, and environmental work grew out of our dredging expertise. Those two make up about 60% of our overall business."

The environmental group, born from hydraulic dredging, now handles subaqueous cleanup of impacted sites nationwide. "We even have a subgroup within our environmental group that deals specifically with water treatment and purification," Binsfeld says. "You can't move a gallon of water on these projects without thinking about how to treat it."

The company's Underwater Services division has become a signature differentiator, fielding one of the largest and most

After opening a shop near the old Milwaukee Road Roundhouse, Jim Brennan moves to La Crosse, WI. He and his son, Ralph, take up permanent residence in La Crosse when his daughter, Ann Marie, graduates high school.



Jim and Gene decide to split Brennan Brothers. Jim incorporates J.F. Brennan Company in La Crosse, WI, where it is still located today, and becomes its 1st President. The brothers divide up their equipment and pursue much of the same work.



1945

1950s

1959

1960s



The post-war era ushers in a variety of opportunities for Brennan Brothers. They start with surplus from the war and progress to build a fleet of marine equipment that they use to take on large bridge projects across the Mississippi, Wisconsin, and other Midwestern rivers. They also continue to work for the railroads, and the U.S. Coast Guard (USCG) becomes another large client when they contract Brennan Brothers to repair navigational markers along the Upper Mississippi River.



Ralph Brennan and Roger Binsfeld rise to leadership positions within J.F. Brennan Company. They focus primarily on river work and bridge construction. Excellent opportunities arise during construction of the new Interstate Highway system.

experienced commercial diving teams in North America. Meanwhile, the Cable and Power group reflects Brennan's alignment with the energy transition — from hydroelectric and nuclear facilities to off-shore wind and subaqueous cable-laying.

"We're very aware of and watching closely a demographic trend, and we've been an acquirer of underwater service type companies," said Binsfeld. "What we see is a lot of the Baby Boom generation are getting to the end of their working careers ... and their next generation may not be fully formed or even interested in getting into the business. My brothers and I are all in our 40s, and we've been a strategic buyer of underwater service businesses that we can plug in and leverage across to grow our own business."

And the Harbor Services business, a smaller portion by revenue but a foundational line since the 1980s, continues to support fleet operations and barge management on the Inland Waterways.

Leadership Through Experience

Though Brennan's reach has expanded, its leadership philosophy remains grounded in humility, safety, and service. Binsfeld credits much of that culture to the company's early days, and his own upbringing. "Our father was very good about getting us out onto projects and

creating a deep passion for the work at a young age," he recalls. "You pair that with growing up on the Mississippi — fishing, canoeing, skiing — and it sets the stage for a lifelong connection to the water."

That connection extends to how Brennan views its workforce. "We always say we're a family business," Binsfeld

explains, "but we're also a business of families. The people who work here, in many cases, their parents or children also work here. That sense of shared purpose and loyalty is real."

Binsfeld emphasizes that growth has come not from chasing size for its own sake, but from cultivating people and pro-

Jim Brennan passes away. Ralph Brennan is elected the 2nd President of J.F. Brennan Company and Roger Binsfeld becomes President of River Steel. The two work closely to run both businesses.

1971




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cesses that sustain excellence. “It’s really a story of not just a family, but a lot of families,” he says. “We’ve built this by bringing in great people — through acquisitions, through organic growth — and aligning them with the values that define Brennan.”

Projects That Define a Legacy

For Binsfeld, the work itself still holds a visceral appeal. “Every one of us gets into this business because you envision yourself out on the jobs building things,” he says. “You think about the impact of what we do.”

He points to several projects that illustrate Brennan’s capabilities — and its purpose. The Fox River cleanup in Wisconsin stands out as a defining achievement: “It was a 40-mile stretch of river contaminated with PCBs, and it was almost a 15-year effort for us. We dredged, processed material, and cleaned up the river. Today, that fishery is open for public consumption. It changed the local economy — anglers, tourism, everything.”

Equally important was the reconstruction of the La Grange Lock and Dam on the Illinois River. “That was a huge project — hundreds of people working every day. The outcome was more efficient movement for the Inland River System, which directly benefits American farmers. It makes them more competitive globally. That’s the kind of impact we love.”

Other milestones include deep-diving construction at Diablo Dam in Washington — “diving below 150 feet, doing construction work safely and precisely” — and complex subsea cable projects in Canada to deliver renewable power to the U.S. “Those projects show the sophistication of our people and the systems we’ve built,” he says. “We like to say everyone at Brennan is a marine professional, and that really shines through in this kind of work.”

The Next Chapter

When asked about the future, Binsfeld’s answer is clear: Brennan’s opportunities lie in energy infrastructure and demographic change.

“It’s an incredible time to be in business right now, especially in the built environment,” he says. “We’re at the precipice of big changes in how power is created, consumed, and transmitted in this country.”

Brennan is already heavily engaged in multiple sectors, from offshore wind, hydroelectric, and nuclear projects, and Binsfeld expects those markets to surge. “As the next five years go on, we’ll see tremendous growth in variable types of power production,” he says. “Our strategy is to stay closely aligned with that growth, both in generation and in transmission.”

The company’s work in subaqueous cable installation is also expanding as the nation’s grid is rebuilt. “Everyone talks about offshore cables,” Binsfeld notes, “but the reality is that new lines are being laid across rivers, lakes, and estuaries all over North America. We’re positioning ourselves right in the middle of that.”

At the same time, he sees demographic shifts as both a challenge and an opportunity. “Many underwater service companies are led by baby boomers nearing retirement,” he says. “We’ve been strategic buyers of those businesses — not just for growth, but to preserve expertise and expand geographically. That trend will continue.”

Binsfeld’s focus now is on ensuring Brennan’s longevity through what he calls the three P’s: People, Process, Profit.

“Everything starts with people,” he says. “We’re investing heavily in developing talent — through our own Brennan University, through partnerships with unions, trade schools, and universities. We want to be seen as a destination for maritime professionals.”



J.F. Brennan Company shifts focus from bridge work to marine construction, teaming with F.J. Roberts Company on several levee restoration projects along the Upper Mississippi River. New vessels and barges are built to carry out larger projects for the U.S. Army Corps of Engineers (USACE) and other owners of river-based infrastructure.



1976

Ray Kronforst becomes J.F. Brennan Company’s first hard-hat diver after attending commercial dive school. Demand soars for barge salvage work along the Upper Mississippi. To salvage a barge, divers are needed to pump out flooded compartments while large A-Frames are used for raising the barge out of the water.

1980s



1984

Brennan Marine Inc. opens its doors to provide switching and fleeting services to the La Crosse Harbor. Tony writes J.F. Brennan Company’s first safety manual to emphasize the growing need for focus on workplace safety.

1990s

Lock & Dam projects and other USACE projects on the Upper Mississippi River become a large portion of Brennan’s work portfolio. Large-scale efforts, such as the rehabilitation of Locks & Dams #10 and #12, provide extended work and increased visibility.

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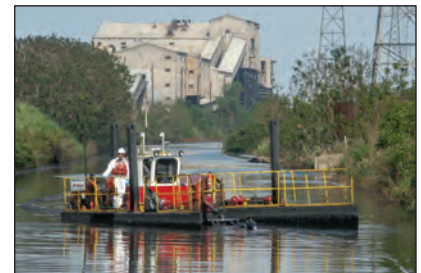


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J.F. Brennan Company purchases the hydraulic dredging assets of F.J. Roberts Company. After several years of teaming and successful partnerships, J.F. Brennan Company begins independent pursuit of large-scale dredging projects. The Bertrom-McCartney Lake Habitat Restoration for the USACE near Cassville, WI is the first such project; more Environmental Management Program projects will follow.



1990



2000s

J.F. Brennan Company's growth accelerates. The company takes on multiple large environmental dredging and restoration projects, a major Lock & Dam rehabilitation, and hydroelectric dam repairs. Work for railroads increases again, this time in specialty underwater pier repairs. Brennan Marine expands into two more harbors between La Crosse and Ste. Genevieve, MO.

2000

As a new millennium dawns, J.F. Brennan Company enters the field of Environmental Remediation. The first project includes precision dredging to remove PCB-contaminated sediment from the Grand Calumet River in Gary, IN. Brennan hires a full-time safety manager to develop and oversee a comprehensive corporate safety program.



Scan the QR code to listen to the full Maritime Matters: The Marinelink Podcast featuring Matt Binsfeld, CEO, J.F. Brennan Company.



J.F. Brennan Company acquires Pro-Dive, Inc., based out of Ottawa, IL. Randy Jacobs, former President and owner of Pro-Dive, becomes Director of the Dive Group.



J.F. Brennan Company acquires Viking Marine Services, and more experienced divers join the team. An office and yard open in Duluth, MN, and several large floating assets are purchased to aid in the pursuit of opportunities on the Great Lakes.

2009-2013

Brennan continues to thrive, tempering effects of the Great Recession's market fluctuations through a carefully balanced portfolio of both public and private sector projects. Work begins on the Lower Fox River Remediation Project near Green Bay, WI; it is the largest environmental cleanup ever undertaken in North America. Lock & Dam work on the Upper Mississippi and Missouri Rivers spurs additional growth. Damaging floods on the St. Louis River in Duluth, MN result in several large-scale hydroelectric dam repair opportunities.

2013



2018

Brennan Marine becomes one of the only inland marine transportation companies to obtain ISO 9001 certification. This is above and beyond the marine industry standard, AWO-RCP, and the USCG Subchapter M requirements.

2018



The company's Total Quality Management System, internally known as the Brennan Management System, reflects the second "P" — process. "We're ISO certified, but we've built what I call our own 'poor man's Six Sigma,'" he explains. "It's about improving safety, efficiency, and quality every single day. When you put great people into great systems and give them the right tools, profit follows."

And profit, in Brennan's view, is not an endpoint but a means of reinvestment. "We're constantly building the balance sheet," Binsfeld says. "That allows us to reinvest — in assets, in people, in acquisitions. It's how we sustain the company for another 100 years."

Leadership in a Time of Change

Every CEO faces challenges, and Binsfeld doesn't shy away from naming them. "The last five years could fill a book," he says. "Between a pandemic, inflation, and policy changes, there's been no shortage of external shocks."

But he draws a clear line between what leaders can control and what they can't. "We don't control the externalities," he explains. "But we do control what happens inside our four walls — our people, our systems, how we deliver our work."

For Brennan, that means an unrelenting focus on safety, quality, and efficiency. "Safe work is a commitment," Binsfeld says. "We won't do anything that jeopardizes that. When we control safety and quality, we become more efficient, more competitive, and ultimately more profitable."

That philosophy — balancing legacy with adaptability — is what Binsfeld believes will carry Brennan to its 200th anniversary and beyond. "We've been here for more than a century," he reflects. "Our job is to make sure that when people look back another hundred years from now, they'll see that we built something sustainable — for our people, for our industry, and for the communities we serve."



2019

One hundred years after Jim and Gene Brennan officially began Brennan Brothers, Matt Binsfeld is elected President of J.F. Brennan Company and Adam Binsfeld becomes President of Brennan Marine. The business moves into its 5th generation of leadership.

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HYBRIDS

OLYMPIC SUBSEA

EFFICIENCY FIRST FOR 'GREENER' OFFSHORE VESSELS

A new generation of hybrid vessels is demonstrating significant gains in both fuel economy and operational output. For Olympic Subsea's owner and CEO Stig Remøy, it proves that technology-led efficiency is the fastest path to decarbonization—and a powerful business case.

By Josefine Spiro

When **Stig Remøy** began pivoting Olympic Subsea toward subsea and renewables a decade ago, the move was met with some internal skepticism. “Naturally, there were internal discussions — some believed oil and gas was the future,” he recalled. Rather than exit the conventional market, Remøy backed a dual-track strategy centered on a simple, guiding principle: cut energy use first. From his company's headquarters in Fosnavåg, a small town on Norway's northwestern coast and the heart of a world-leading maritime cluster, Remøy sat down with *Maritime Reporter & Engineering News* sister-publication *Offshore Engineer* to explain his strategy.

“We build and operate ships that serve both offshore wind farms and traditional oil and gas fields, because the transition takes time,” Remøy explained. This approach is embodied in a new generation of vessels, including hybrid-electric CSOVs already in service and advanced Sustainable Energy Vessels (SEVs) on the way.

The Efficiency Doctrine

Olympic's strategy has been a systematic technological progression. “We started transitioning early, back in 1999,” Remøy said. “We focused heavily on energy: first diesel-electric instead of diesel-mechanical, then hybrid”. The latest vessels layer on more advanced solutions, including a

An Olympic Subsea CSOV maintains its position next to an offshore wind turbine, showcasing the 'walk-to-work' operations essential for maintenance. The vessel's advanced design is key to maximizing uptime and operational efficiency in the renewables sector.

Image courtesy Olympic Subsea

four-thruster azimuth propulsion system — providing what Remøy likens to a maritime 'four-wheel drive' — as well as permanent-magnet (PM) technology, variable-speed generators, and waste-heat recovery systems. The impact is substantial. A modern vessel of around 6,700 gross tonnes with up to 126 personnel can now operate on approximately three tonnes of fuel per day in certain scopes, whereas older conventional ships might consume three to four times that amount.

Remøy emphasized that the economics support these high-cost, higher-efficiency choices. "These kinds of technology choices have always paid off for us," he said. "When we built our first diesel-electric PSV in 1999, conventional options were about 20% cheaper, but we chose it because we knew the energy had to be paid for... With carbon taxes multiplying by 2030, the return on energy efficiency will only get bigger".

A New Generation of Hardware

Leading this new generation are the company's two Ul-

stein-designed SX222 CSOVs, Olympic Boreas and Olympic Notos. Built at Ulstein Shipyard using state-of-the-art Norwegian technology, its bi-symmetrical TWIN X-STERN hull is purpose-built for both wind and subsea work, allowing either end to face the weather to reduce energy use during dynamic positioning.

The results in the field are stark:

- **Operational Output:** Independent client measurements confirm more than 25% higher operational efficiency than competitors. On wind farms like Horns Rev, for example, the vessels can service up to 200 turbines in the time it takes others to manage 150.

- **Energy Savings:** Olympic's own data reveals the new systems have driven a roughly 50% reduction in energy consumption compared to its 2012-era fleet.

"The uplift comes from the total system," Remøy argued. "It's the vessel itself, the gangway, how quickly you get to the tower, how efficiently the engineers can perform main-

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Stig Remøy presents data demonstrating the success of his 'efficiency first' strategy. The chart shows that the new CSOVs, **Olympic Boreas and Olympic Notos**, have achieved a roughly 50% reduction in fuel consumption per gross tonnage compared to the company's older vessels, proving the business case for the new technology.

Copyright Josefine Spiro

tenance, and how you manage the weather windows". A key component is the vessel's W-type Ampelmann gangway, a fully electric system with an integrated lift and a large operational envelope, compensating for landing heights from approximately 8 to over 30 meters.

Building on these lessons, the next leap is the Kongsberg UT 7623 SEV. Developed in partnership with Kongsberg Maritime, two of these Sustainable Energy Vessels are slated for delivery in 2027.

These vessels incorporate close to NOK 1 billion in equipment and technology from the Norwegian maritime cluster per pair. "We are aiming for at least a 10% further reduction on the newbuilds... we invest more to achieve lower consumption and higher efficiency," Remøy stated.

Remøy Proposes a CO₂ Fund

With Norway's CO₂ tax expected to rise significantly by 2030, Remøy argues passionately that the industry needs a mechanism to accelerate its green transition. His solution is a dedicated CO₂ fund, modeled directly on the country's NOx Fund—a framework that has been a proven success in financing emissions-cutting projects since 2008.

"The tax should be returned to the industry through a CO₂ fund. That way, shipping companies can invest in green tech-

nology that actually cuts emissions".

Remøy pointed out that such a system would create a powerful circular economy for decarbonization. It would not only incentivize shipowners to adopt new technologies but also strengthen the Norwegian equipment industry's global competitiveness by scaling up demand for innovative, cost-effective solutions. "In Norway, we should do the same as the EU requires and ensure the money is used for emission reductions, with simple administration and clear, measurable effects," he stated.

The Business Case

The strategy is already rebalancing the company's portfolio. "Ten years from now, renewables will be our most important leg to stand on," Remøy predicted, "but oil and gas will be around for decades and will need efficient infrastructure. Our newbuilds fit both."

This versatility and performance are key for clients like Siemens, RWE, Ørsted, and GE. This success, Remøy insists, is rooted in local collaboration. "The Norwegian maritime cluster is absolutely crucial," he explained. "Without close cooperation with suppliers and shipyards, we could not have achieved this."

For Remøy, the path forward is clear and pragmatic. "Our



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approach is to lead by cutting energy consumption first,” he concluded. “After that, the choice of fuel—be it methanol, hydrogen, ammonia, or battery—can follow once the market and infrastructure are ready.”

The once-skeptical voices have grown quieter as the data from the new fleet comes in, proving that the big bet on efficiency is already paying off—not just in lower emissions, but in the hard-nosed economics of offshore operations.

Photos, starting right and continuing clockwise:

The fully electric, W-type **Ampelmann motion-compensated gangway** is a key component of Olympic's new CSOVs.

The **Olympic Boreas** is christened in Fosnavåg, the heart of the Sunnmøre maritime cluster on the northwestern coast of Norway.

The hybrid-electric CSOV Olympic Boreas, an **Ulstein-designed SX222**, operates in an offshore wind farm.

A rendering of the **Kongsberg UT 7623 Sustainable Energy Vessels (SEVs)** slated for delivery to Olympic Subsea in 2027. The design is capable of serving both offshore wind and traditional oil and gas installations.

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Image courtesy of Orcan Energy

WASTE HEAT

AN UNDERUTILIZED RESOURCE

Fuel-agnostic and suitable for newbuilds and retrofit, Organic Rankine Cycle waste heat recovery systems are making headway as an energy-efficiency measure.

By Wendy Laursen

Market prospects are looking so good for waste heat recovery systems that Orcan Energy recently expanded its industry relationships by partnering with Goltens on installations.

Andreas Sichert, CEO of Orcan Energy, said: “Waste heat recovery is one of the most powerful and underutilized tools for improving energy efficiency. In shipping alone, over 100 TWhth of waste heat could be harnessed.” This is equivalent to the power consumed by more than 6.3 million people.

Over half of the energy from fuel consumed by ships’ combustion engines is lost as waste heat via exhaust gases or cooling circuits such as jacket cooling, scavenge air, or lubrication oil. Around 50% of this waste heat is available as low-

temperature heat (below 100°C), which can be captured by Organic Rankine Cycle (ORC) waste heat recovery systems. These systems use organic fluids to drive turbines that convert low-temperature thermal energy into electricity. This offers a simpler and more compact solution than the steam turbines used in other waste heat recovery systems.

Jonah van Sluijs, Marine Sales and Business Development Manager at Orcan Energy, says retrofits are gaining momentum and newbuilds are increasingly being designed with waste heat recovery in mind. Standardized interfaces and reserved space at the shipyard level make integration simpler from day one.

He highlights some of the company’s recent technology developments:

Modular ORC-based waste heat recovery packages have been introduced designed for retrofit in constrained engine rooms with skid or split-skid options.

Multi-source heat harvesting is now possible, combining exhaust economizers, high- and low-temperature jacket water, steam systems via economizers, and thermal oil systems into a single power module.

Hybrid integration blocks with shaft generators or batteries allow operators to prioritize recovered energy where it offsets the most expensive kWh on board.

Together with higher-temperature modules, the Orcan Energy ePM200 XR enables the recovery of energy across a wide temperature range and operational profile, capturing value both at high-load cruising and lower-load conditions. The ePM200 XR is a new lower-temperature waste heat recovery unit optimized for moderate-temperature sources, such as jacket water or auxiliary cooling loops (80–120°C). It delivers up to ~200 kW net electrical output, ideal for vessels with limited exhaust heat or those operating at part load or slow steaming.

Yes, slow steaming does impact shipowners' decisions on adopting waste heat recovery, says van Sluijs. "At reduced engine loads, there is less exhaust and system heat available, so the net output from traditional waste heat recovery mod-

ules is lower than at full load. To address this, shipowners are increasingly adopting a portfolio approach: combining high-temperature recovery modules on the exhaust, steam, or thermal oil side with lower-temperature units, like the ePM200 XR, on hot water loops. This ensures meaningful energy recovery even at partial loads."

Modern ORC controls further optimize performance dynamically, keeping modules online and efficient across varying operating conditions. As a result, owners can maintain compliance with efficiency and emissions regulations, capture OPEX and CO₂ savings, and reduce reliance on slow steaming without sacrificing operational flexibility, says van Sluijs.

Waste heat recovery partners well with new fuels such as methanol. System manufacturer Climeon foresees the already favorable payback period for its ORC waste heat recovery system as potentially being cut in half by 2030.

"Vessels operating on alternative marine fuels typically offer a more favorable waste heat profile for ORC systems compared to those running on HFO," says Fredrik Thoren, executive vice president, head of marine sales at Climeon. "For example, methanol-fueled vessels often require less auxiliary heating, such as tank heating, which means more waste heat is available for recovery. In many cases, this allows the Climeon HeatPower 300 to generate more electricity.

Low-temperature heat can be captured by Organic Rankine Cycle (ORC) waste heat recovery systems.

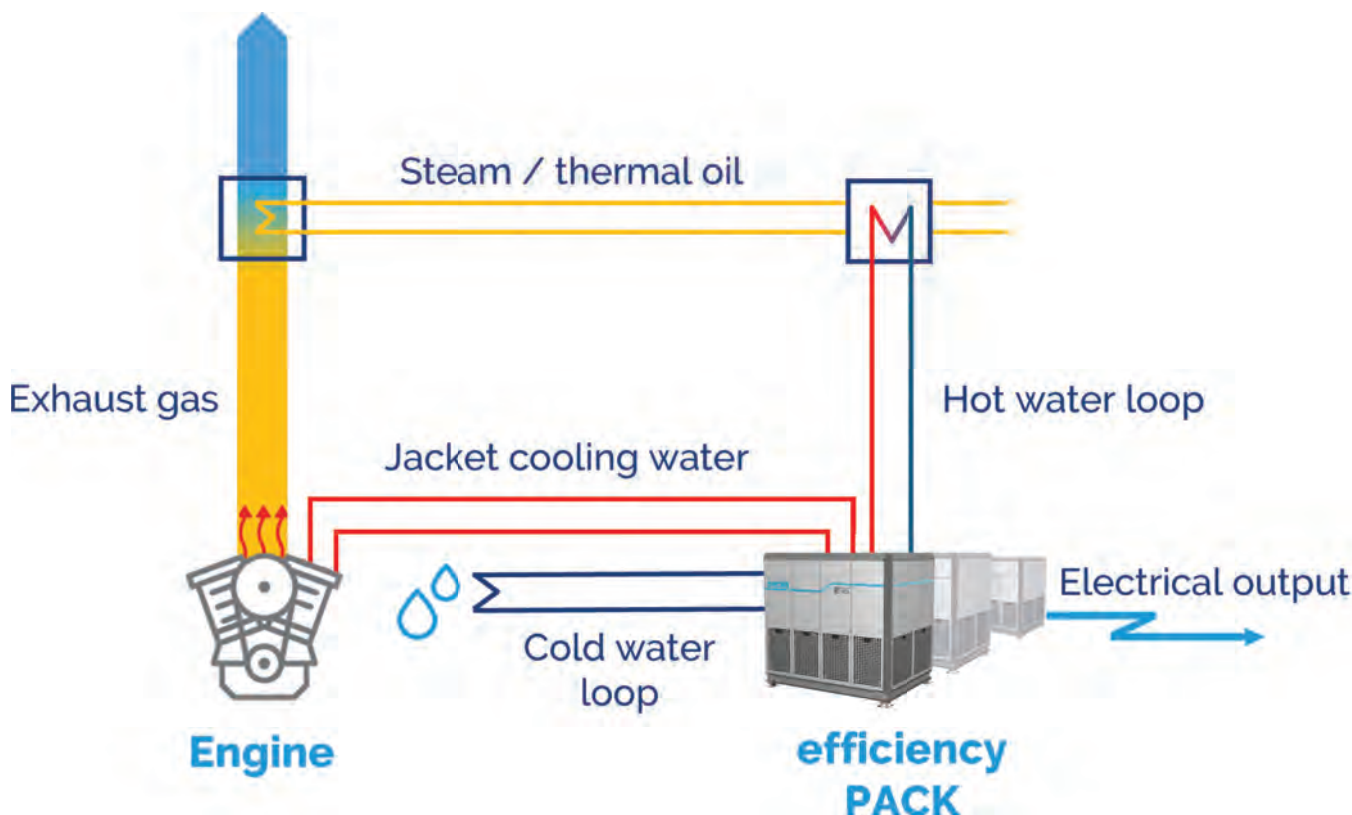


Image courtesy of Orcan Energy

“Additionally, methanol engines often produce lower exhaust gas temperatures. HeatPower 300 can operate effectively using only the jacket water or high-temperature cooling water, without the need for an added steam boost, making it particularly well-suited for vessels without excess steam.”

In June, Climeon received a repeat order from NovaAlgoa Cement Carriers (NACC) to supply its HeatPower 300 waste heat recovery system for a second cement carrier. The new 38,000-ton vessel will be the world’s largest cement carrier powered by renewable methanol and is expected to reduce CO₂ emissions by more than 60% compared to conventional vessels due to the green technologies it features.

And in September, Jiangsu New Yangzi Shipbuilding selected Climeon’s HeatPower 300 system for a new series of methanol dual-fuel container ships. Climeon’s HeatPower 300 units are already operational on three of six 17,200 TEU methanol-fueled container ships being built by HD Hyundai Heavy Industries for Maersk, Climeon’s first large-scale new-build project.

Vessels that operate on higher speed/higher engine load and with fewer other heat consumers on board will have more available waste heat and will benefit the most from an ORC retrofit installation. Operation in colder sea water tempera-

tures will also increase power output from the ORC.

Whether multiple Climeon units are installed depends on the ship’s design and operational profile. An example case would be a RoPax vessel with a 4-stroke engine having total engine capacity around 30MW, operating primarily in colder climates and at high speeds — maintaining an average main engine load above 60%. Under these conditions, a significant and consistent amount of waste heat is available, making the installation of multiple HeatPower 300 units a practical way to maximize energy recovery and cost savings, says Thoren.

In the case of a 180,000 GT cruise ship with a main engine power of 85MW and two HeatPower 300 units, fuel savings could be 480 tonnes/year if the ship is in operation 6,500 hours primarily in seawater temperatures between 20 and 30oC.

Thoren says that the system is best suited for retrofit on vessels younger than 15 years, but there is no technical limit related to the age of the ship. Based on the current product portfolio, Climeon’s addressable market includes approximately 30% of the 1,500–1,800 new vessels built each year. In addition, an estimated 8 to 10% of the roughly 110,000 vessels over 100 gross tons in the existing global fleet are considered suitable, based on age and size, for retrofit of Climeon’s technology.

Climeon’s addressable market includes approximately 30% of the 1,500–1,800 new vessels built each year and an estimated 8 to 10% of the roughly 110,000 vessels over 100 gross tons in the existing global fleet.

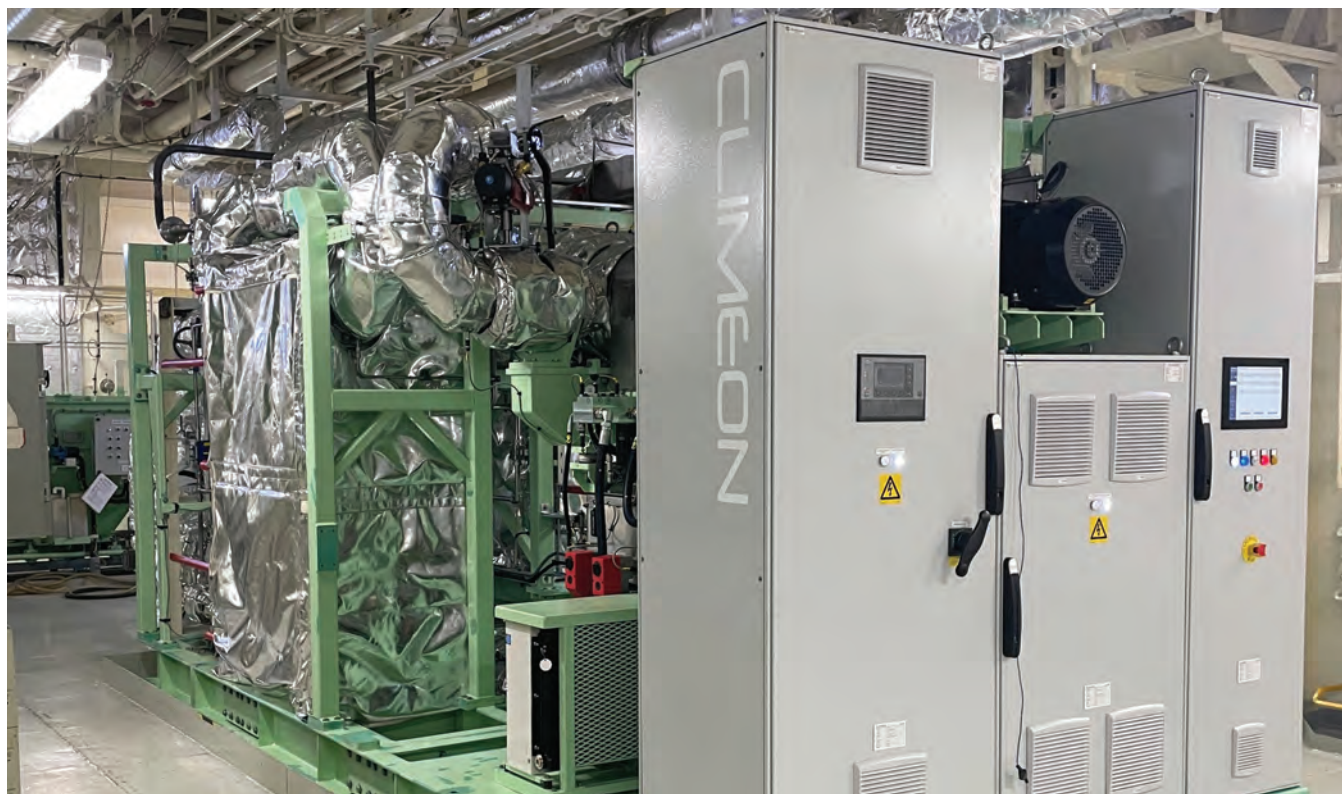


Image courtesy Climeon

ICEBERG FAKERS

*Canada, Finland, U.S.
up the ante to Catch
Russia in Arctic Operations*

C a n a d a • F i n l a n d • U S A

ICEBREAKERS

By Philip Lewis, Director of Research, Intelatus

Operating in extremely harsh and unpredictable environment of the Arctic, Antarctic, Baltic, the Great Lakes and St. Lawrence Seaway, the Azov and Caspian Seas and various ports, harbors and inland waterways pose many challenges and hazards to navigation. The global fleet of active, under construction and ordered icebreakers which support ice management amounts to 300 vessels, close to 80% of which are active and in service. Nearly three-quarters of the fleet is operated by the “big three”, Russia, Canada and Finland. 130 are IACS Polar Class PC2 to PC5.

The fleet of 130 Category A polar class icebreakers excludes some naval patrol vessels for which Polar Class ice capabilities are not identified.

It should be noted that once many of the vessels now under construction or on order are delivered, we will begin to see older vessels being retired and as a consequence net fleet size may not be increased significantly by the end of this decade.

ICE Pact Countries & NATO allies

Here we review the leading icebreaker players, including what drives their activity and the fleet profile.

The USA, Canada and Finland finalized the Icebreaker Collaboration Effort (ICE Pact) at the end of 2024, an MoU to support the production of arctic and polar icebreakers. Specific details of how the pact will work are still being discussed. The MOU, effectively a statement of intent to align economic

and security interests, particularly to counter growing Russian Northern Sea Route and China’s Polar Silk Road activity in the Arctic, acknowledges a combined intent to design, build and maintain new “best-in-class” icebreaking capacity in the three countries, highlighting the need to developing shipyard, engineering and marine equipment supplier capabilities and capacity.

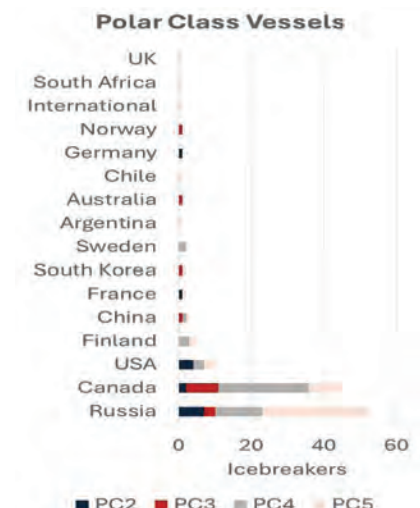
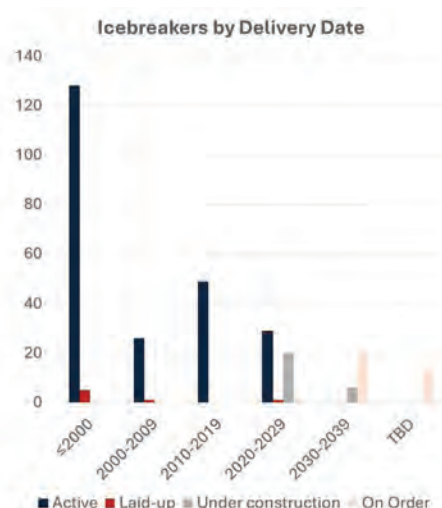
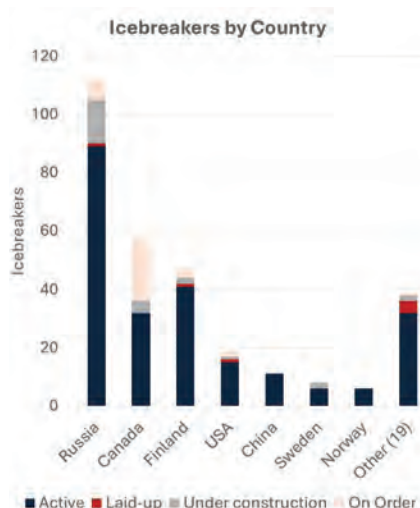
Canada

Canada has 58 active, under construction and on order icebreakers.

Northwest passage

There are three main potential waterways passing through areas traditionally closed by sea ice that can shorten the shipping distance between Europe, Canada and the U.S Northwest

Icebreaker Fleet Profile



Source: Intelatus Global Partners



NORTH AMERICA'S LEADING DESIGNER OF ICEBREAKERS

When the U.S. Coast Guard needed a state-of-the-art, mission-ready icebreaker design for its new fleet of Arctic Security Cutters, Seaspan's design checked all the boxes. We are proud to work hand in hand with our American and Finnish partners to provide the USCG with an icebreaker design that will fortify and strengthen North America's Arctic security.

and Russian Northeast, the North-West Passage (close to the Canadian coast), the Northern Sea Route (Murmansk in northwest Russia to Vladivostok near Japan) and the Transpolar Sea Route (the largely icebound route closest to the North Pole.).

The Northwest passage refers to seven sea passages that passes through the Canadian Arctic Archipelago, connecting the Atlantic and Pacific Oceans. Often iced up for significant parts of the year, recent melting sea ice has opened the possibility to use the passage as a

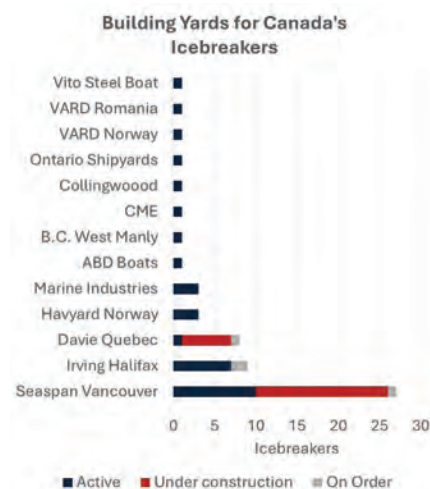
sea route to safe shipping distance.

Sovereignty over the passage is a source of political tension. Canada claims that the passage is part of its territorial waters. Others, including the United States, claim that the water are international. Under existing treaties, U.S. icebreakers can operate in the passage subject to seeking Canada's permission. However, as the sea ice melts, more of the passage becomes open to vessels other than ice breakers.

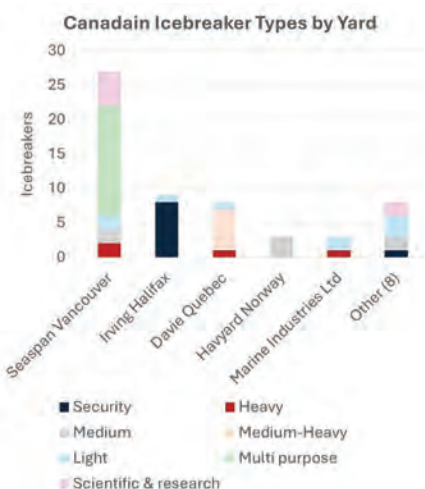
According to Aker Arctic, the first commercial cargo vessel to complete

the transit was the Nordic Orion in 2013. 2023 was a record year with 24 completed transits through the passage. In 2024, 18 commercial vessels completed the complete transit. 11 of the 2024 journeys were westbound (six cruise ships and five cargo ships) and seven eastbound (two cruise ships, four cargo ships and one tanker). The data excludes cargo vessels completing only part of the route (basically Canadian domestic traffic).

Canadian Icebreaker Yards



Source: Intelatus Global Partners



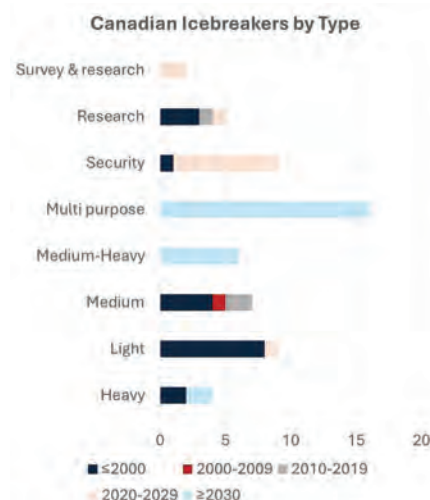
Shipbuilding Strategy

To address growing requirements for polar vessels and aging yards which had been impacting by international shipbuilding cycles, the Canada's National Shipbuilding Strategy (NSS) began in 2010 and seeks to support the Canadian marine industry and promote the domestic construction of vessels .

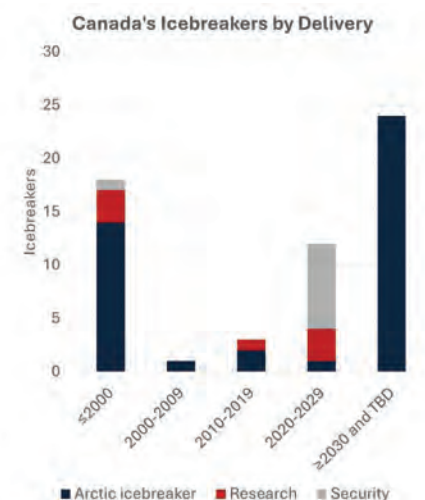
The strategy has three components to support programs of the Royal Canadian Navy, Coast Guard Canada and Transport Canada, the key one for icebreaking being the program to build large vessels, including eight Arctic and offshore patrol vessels (to be built at Irving Halifax), up to 16 multi-purpose icebreakers (to be built at Seaspan Vancouver), six Program Icebreakers (to be built Davie Quebec), two heavy polar icebreakers (one to be built at Seaspan Vancouver and one at Davie Quebec) and an Arctic research vessel (built by Seaspan Vancouver).

It should be noted that, in March 2025, the Canadian government accepted that Davie build the PolarMax heavy polar icebreaker at its Helsinki Shipyard in Finland, rather than in Canada, although as the contract holder and the commissioning yard, we are still reflecting the vessel as sourced from a Canadian yard. Davie acquired Finish companies Helsinki Shipyard in 2023 and Enersense Marine and Offshore in 2025, and Gulf Copper in the USA in 2025 as it seeks to build a position as a builder of ICE Pact icebreakers.

Canadian Icebreakers



Source: Intelatus Global Partners



Canada's NSS budget for of the ice-breaking 30 vessels is C\$31.2 billion (~US\$24.7 billion at current exchange rates) and the budget for six medium-heavy icebreakers is currently being developed.

The NSS also includes repair and refit projects of existing icebreakers, including three medium class icebreakers (two at Newdock Shipyard and one at DF Barnes), and life extensions of seven icebreakers (at Davie Quebec, Ontario Shipyards, Newdock Shipyard, Verrault Quebec, Seaspan Vancouver and Ocean Industries Quebec).

USA

The U.S. currently only operates one heavy (the 1976-built Polar Star), two medium icebreaking vessels (the 2000-built Healy and the 2012-built Storis, the former ECO Aiviq which was converted to a medium icebreaker in 2024), three polar research vessels, three polar security cutters and nine Coast Guard Great Lakes icebreakers (with a further vessel idle/laid-up). There is currently only one icebreaker, a polar security cutter (Polar Sentinel) being built at Bollinger (originally started when the yard was Halter Marine with an original delivery date of 2024 and a current estimated delivery of 2030), under construction in the USA, with two sister vessels under design and budget development.

Significant attention was paid in April 2025, when the U.S. White House issued a key Executive Order demanding the creation of a maritime Action Plan to revitalize U.S. maritime industries. One the main elements of the order addressed ensuring "the security and leadership of Arctic Waterways" by America, through building icebreakers in U.S. shipbuilding yards, given that all U.S. Navy and Coast Vessels are required by law to be built domestically. The Executive Order has been followed by a \$8.6 billion budget for new ice-breaker construction within July's One

Defining Ice

There are four kinds of floating ice, [1] sea ice, [2] ice formed on land and found floating at sea, [3] lake ice and [4] river ice. Further, there are six stages of ice formation, two of which are the most relevant to polar icebreaking.

• **Old ice:** Second-year ice has survived one summer's melt or multi-year ice which has survived at least two summer's melt and is up to 3-meters or more in thickness.

• **First year sea ice** of not more than one winter's growth, ranging from 0.3-2-meters thick.

Big Beautiful Bill Act. Drilling down to specific Arctic initiatives, the Department of Interior's Bureau of Ocean Management seeks to align to the White House initiative for promoting energy independence through development of Arctic energy and marine minerals.

However, the United States is belatedly coming to the party, where countries like Canada, Russia and Finland have advanced the supply chains to

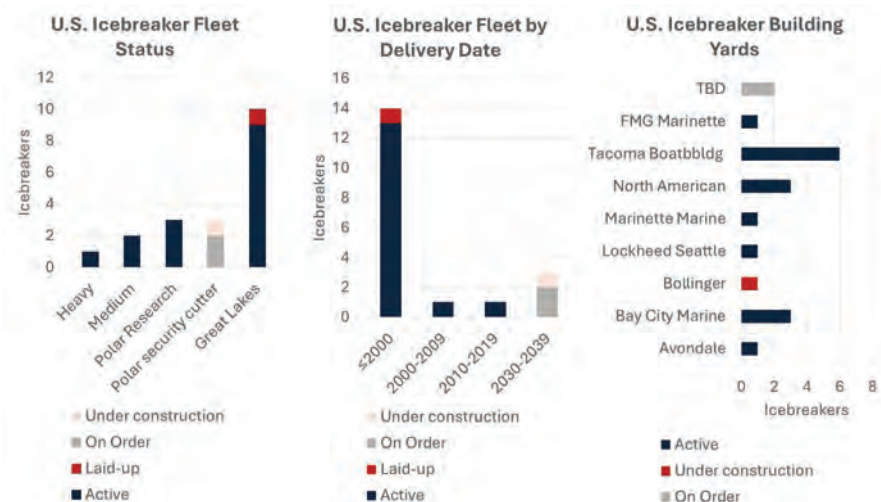
support increased maritime activity in the Polar regions. This issue has been addressed in a further Presidential Memorandum in October 2025 identifying that the "United States Coast Guard's fleet of icebreakers and Arctic-capable vessels remains insufficient to meet current operational demands and presents a national security risk". The memorandum, signed in the presence of the president of Finland, further

USCG Requirement for ASCs and Davie and Rauma Marine Contractors Designs

Requirement	USCG Requirement	Davie MPPS 100	RMC MPI
Dimensions (L x B x D in feet)	360x67x21	328x69x22.9	
Range (nm)/endurance (days)	6,500/60	n/a	90 days
Polar Class	Not stated	PC4	PC3
Propulsion power	Not stated	7.2MW	13MW
Total power	Not stated	10.1 MW	22MW
Crew/passengers	Not stated	50	124

Source: Intelatus Global Partners interpretation of data from Arctic Today and Reuters

U.S. Icebreakers



Source: Intelatus Global Partners

states that it is in the national security interest of the USA to build up to four Arctic Security Cutters (ASCs) abroad. The memorandum calls for a phased construction plan within two months of the date of the memorandum.

At the same time as signing the October 2025 Presidential Memorandum, the US and Finland signed an MOU on icebreaker collaboration. The memorandum indicated that US Coast Guard is planning to buy 11 medium icebreakers (ASCs), of which four to be built in Finland. The deal is reported to identify two designs to be built, although no contracts have been executed yet:

- Reuters are reporting that **Davie** will build two MPS-100 vessels at **Helsinki Shipyard** and a further three will be built at **Davie's Gulf Copper** yard in Texas.

- **Rauma Marine Contractors** will build two **MPI** designs (a Canadian Coast Guard design built by Seaspan) in Finland and four additional MPI designs will be built at **Bollinger** in Louisiana.

Explaining the U.S. interest in the

ICE Pact program, the Department of Defense published an updated Arctic Strategy in 2024, addressing the need to reflect major geopolitical changes, such as the Ukraine war, Finland and Sweden joining NATO, increased collaboration between Russia and China and the acerbating impacts of climate change.

The U.S. Coast Guard Polar Security Cutter (PSC) and Arctic Security Cutter (ASC) Icebreaker Programs addresses 2023 Coast Guard analysis pointing to the need for eight or nine icebreakers to ensure year-round access to the Arctic and Antarctic, consisting of four to five heavy icebreakers and four or five medium icebreakers. The Coast Guard also identifies the need for a new Great Lakes icebreaker, similar to the 2006-built Mackinaw for ~\$350 million.

The U.S. White House issued a key Executive Order in April of this year requesting a plan for ensuring “the security and leadership of Arctic Waterways” by America, through building icebreakers in U.S. shipbuilding yards. This order was strengthened by the

June 2025 presidential Memorandum on Safeguarding U.S. National Interests in the Arctic and Antarctic Regions, which identifies the need for a “ready, capable, and available fleet of polar security icebreakers that is operationally tested and fully deployable by Fiscal Year 2029” mandating the procurement of year-round Arctic and Antarctic icebreaker capabilities (at least three heavy Polar Security Cutters), an assessment of requirements for medium PSCs, a plan on how to bridge the gap between current icebreaking needs and the time taken to build new icebreakers, including leasing domestic or foreign partner capacity. The Executive Order and Memorandum has been followed by a \$8.6 billion budget provision for new icebreaker construction within July's One Big Beautiful Bill Act.

- \$4.3 billion is provided for procurement of Arctic and Antarctic Polar Security Cutters, including equipment and program management. equipment related to such cutters, and program management. The first vessel, USCGC Polar Sentinel (WMSP-21) is under construction at Bollinger Shipyards. The budget funding allows for the construction of two further vessels

- \$3.5 billion is provided for procurement of Arctic and Antarctic Coast Guard Security Cutters, including equipment and program management. equipment related to such cutters, and program management. The Coast Guard has released a request for information for 100-meter long and 2-meter-wide Arctic security cutters. The budget allocation is estimated to be able to support the construction of three vessels.

- \$816 million is provided for procurement of light and medium icebreaking cutters, “and equipment relating to such cutters, from shipyards that have demonstrated success in the cost-effective application of design standards and in delivering on schedule and within budget, vessels of a size and

Polar Class

Sea ice coupled with extreme weather conditions and limited port infrastructure results in the need for specialist ice-strengthened vessels (Ice-class), generally featuring strengthened hulls, structures, and, sometimes, ice-resistant propulsion and maneuvering systems. Ice-class vessels are generally designed to navigate in the wake of icebreakers, which are specifically designed to break through ice.

Whereas Ice-class refers to the broad category of several thousand commercial vessels, Polar Class vessels are effectively an Ice-class subset built to operate in Arctic (Canada, Danish Greenland, Finland, Iceland, Norway, Russia, Sweden and the USA (Alaska)) and Antarctic Polar waters.

Entering into force in 2008, the IACS Polar Class system has sought to standardize the pre-existing Arctic and Sub-Arctic rules established by several governments and each Class Society.

The highest of seven Polar Class ratings is PC1 (no currently active vessels), reflects vessels capability to operate without limitations. PC5 is the lowest rating suitable for year-round navigation in Arctic waters. PC1-5 are Category A Polar Ships. PC6 and PC7, Category B Polar Ships, are notations for summer navigation in Arctic waters and winter navigation in sub-Arctic waters, such as the Baltic. Category C vessels can operate in open polar waters and light sea ice polar waters.

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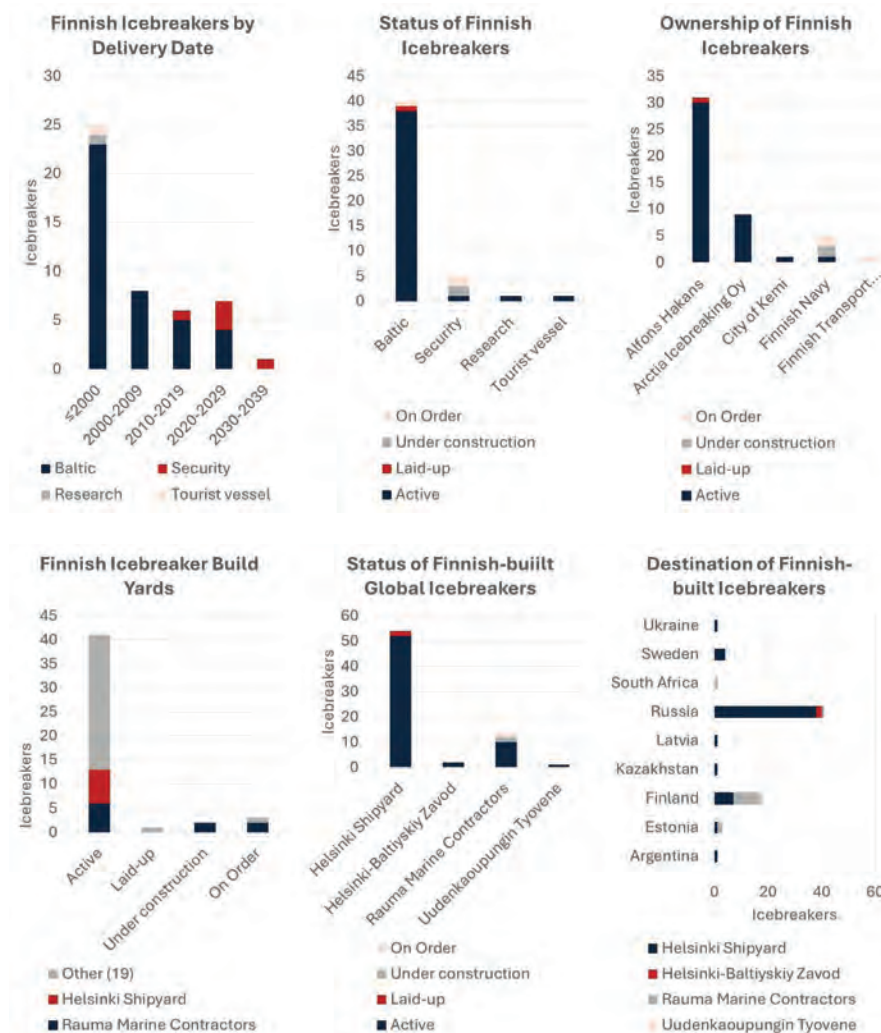
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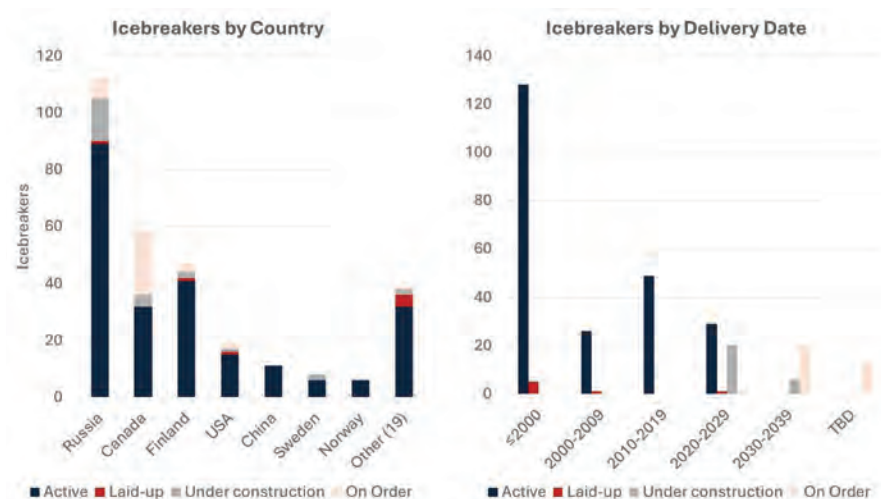


Finnish Icebreakers



Source: Intelatus Global Partners

Swedish Icebreakers



Source: Intelatus Global Partners

tonnage that are not less than the size and tonnage of the cutters”.

- \$300 million is provided for home-porting of the existing polar icebreaker commissioned into service in 2025 (the 1992-built Storis medium icebreaker bought last year from ECO).

The U.S. Maritime Administration (MARAD) issued a request for information in March 2025 to identify which U.S. shipyards have the capacity, capability and readiness to build ICE Pact icebreakers.

Yards are forming strategies to build Coast Guard icebreakers:

- Canada’s **Davie**, the owner of leading icebreaker company **Helsinki Ship**, announced the acquisition of Texas-based **Gulf Copper** in June of this year and a plan to invest \$1 billion in upgrading and expanding the yard capacity.

- **Bollinger and Edison Chouest Offshore** have formed the United Shipbuilding Alliance to design and build Arctic vessels.

- **Bollinger**, Finland’s **Rauma Shipyards**, Canada’s **Seaspan Arctic** and Finland’s **Aker Arctic** have formed a partnership to build the Coast Guard Arctic Security Cutters.

- We anticipate the **Hanwha Philly Shipyard** will also be targeting the Coast Guard programs.

In recognizing that the current Coast Guard icebreaking fleet is both aging and cannot be replaced quickly, the Coast Guard is currently executing the In-Service Sustainment (ISVS) Program at the Coast Guard yard in Curtis Bay, Maryland, and at commercial yards. The program includes:

- Service life extension of the U.S. largest polar icebreaker, the 1977-built Polar Star. The final phase of the five-stage 2021-2025 life extension program at Mare Island Dry Dock, California, commenced in March of this year Shipyard

- Service life extension of the 1999-built medium icebreaker Healy

in a five-phase program between 2026-2029.

- Completion of life extension of the nine Bay-class Great Lakes icebreakers for 15 years in 2023 at the Coast Guard yard in Curtis Bay, Maryland. The budget estimate per vessel was \$13.5 million.

To address the short- to medium term capacity shortage, of late the White House has held discussions with Finland over potential acquisition of the 1993-built multipurpose icebreaker Fennica and it has been reported that the Coast Guard is negotiating with a Finnish shipbuilder (reported in the Finnish press as Rauma Marine Contractors) acquiring newbuilding three to five Arctic Security Cutters and possibly also three Polar Security Cutters.

Under the current White House direction, one expected role of U.S. icebreakers is to support oil and gas exploration and production in the Department of the Interior's High Arctic Outer Continental Shelf Planning Areas.

One issue for the U.S. reliance on partnering with ICE Pact and NATO partners is the recent unpredictability in White House policy in trading relationships, witnessed by an aggressive and fluid situation around tariffs on key trading partners like Canada (although situation unclear on goods traded under the Canada-US-Mexico Agreement (CUSMA), signed in 2018 and updated in 2019), the European Union, Japan and South Korea and pressure on NATO allies to contribute more in financial terms to the alliance. It does not mean that deals will not be made, but the environment in which the deals are being made is not one of high confidence.

Greenland is seen as a strategic and commercial asset for U.S. national security purposes. Greenland hosts the strategically important U.S. Pituffik Space Base, an important element of the proposed Golden Dome early warning and missile defense system. The President and various senior members of his

administration have made statements on plans to buy or take-over Greenland. A Bill, H.R.1161 - Red, White, and Blue and Act of 2025, has been introduced to the House of Representatives and proposes authorizing the President to negotiate with the government of Denmark "to purchase or otherwise acquire" Greenland. The Bill is being discussed by the Committee on Foreign Affairs and the Committee on Natural Resources. The U.S. position is a cause of tension with Denmark and Greenland, who do not support the U.S. initiative.

Finland

Finland's maritime coast is bordered by the Gulf of Bothnia and the Gulf of Finland, both sub-areas of the Baltic. Icebreakers are essential for maintaining year-round access to its ports and winter access for shipping to the Baltic.

Finland is home to 42 active icebreakers, is currently building two and

has a further three on order. 60% of active icebreakers were built on or before 2000 and a further 8% were built in 2000-2009. The main national icebreakers are owned by Artica Icebreaking and the Finnish Navy operates the corvettes and security vessels. The largest Finnish icebreaker owner, Alfons Hakons, operates harbor towage vessels and is not a main shipping lane icebreaking company.

Construction of Finland's bigger icebreakers has been concentrated in two main yards, what are now known as Helsinki Shipyards and Rauma Marine Contractors. However, the Alfons Hakons fleet has been built in a large number of European yards.

Of note, 31% of the global active icebreaker fleet has been built by Finnish yards, and many more overseas-built vessels have been designed by Finnish naval architects and engineering firms, such as Arker Arctic, Bluetech Finland,

The advertisement for Detyens Shipyards, Inc. features a large, detailed image of a ship's propeller. Overlaid on the image is a red banner with the slogan "We Fix Ships" in white, handwritten-style text. In the top left corner, the company's website "detyens.com" and email "drydock@detyens.com" are listed, along with social media icons for Facebook, LinkedIn, Twitter, and YouTube. In the top right corner, there is a QR code and the company logo, which includes a ship icon and the text "Detyens Shipyards, Inc. Charleston, South Carolina". At the bottom of the image, a dark banner contains the text "Ship Repair | Conversions | Drydocking" in white.

Comatec, Elomatic and ILS Oy.

Finland is also a leading supplier of icebreaker systems and equipment, with companies present in design through build, and systems and equipment:

- Design: **Aker Arctic, Bluetech Finland, Comatec, Eloatic and ILS Ship Design.**
- Build: **Helsinki Shipyard, Rauma Marine Contractors, Almaco, Craftmer, Helkama Bica, Hexagon and NIT Naval Interior Team.**
- Systems and equipment: **ABB, Kongsburg Maritime, Wartsila, Steeprop, Alfa Laval Aalborg, Alupro, AQTrafotek, Auramarine, Furno, Halton Marine, Lamor, Makon, Marioff, Promeco, Synkronex, Vibrol and WE Tech Solutions.**

Finland is targeting the potential opportunity presented by the ICE Pact. A good example is Helsinki Shipyard's ability to leverage its ownership by Davie Quebec to build one of Canada's new Aker Arctic ARC 148 PolarMax heavy polar icebreakers, with Davie completing and commissioning the vessel at its Quebec yard.

Rauma Marine Contractors is currently building four Polar Class navy corvettes and Aker Arctic is developing the design for a new Baltic escort icebreaker for the government, where the building yard is to be decided.

Finland and Sweden signed a collaboration agreement in September 2024 where the countries agreed to explore jointly developing an Arctic icebreaker to research the impacts of global warming, pollution impacts from Arctic Russia and to secure subsea communications and electric cables. The countries further identify the need to cooperate on the renewal of the icebreaker fleet suited to the Baltic.

Finland's Transport Agency (FTA) and the Swedish Maritime Administration (SMA) developed the Baltic Ice-class rules, starting in the 1890s and have been subsequently updated. The highest Finnish-Swedish Ice Class, 1AS, was introduced in 1965, which is roughly equivalent to Polar Class PC6, allowing winter navigation in sub-Arctic Waters (the Baltic) and summer navigation in the Arctic Waters.

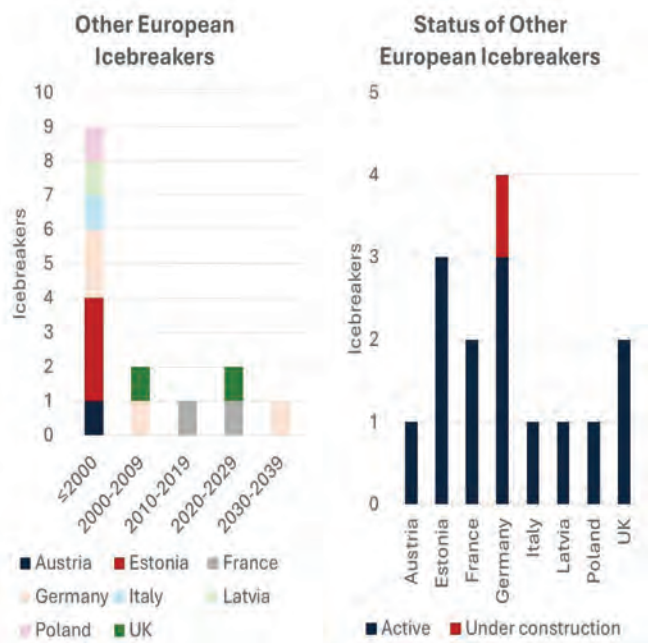
NATO Arctic Countries

Outside of Russia, the remaining seven Arctic powers are now all members of NATO, which sees what it refers to as the High North as being an increased geopolitical competition. The ICE Pact of Canada, Finland and the United States is one response to this challenge. Now we address the remaining four NATO Arctic members:

Sweden

The Swedish Maritime Agency has a prime role to keeping

Other European Icebreakers



Source: Intelatus Global Partners

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ICE PACT COUNTRIES & NATO ALLIES

shipping channels in Gulf of Bothnia open for navigation. The northern part of the Gulf of Bothnia traditionally freezes from January to June.

Sweden operates a fleet of six aging Baltic icebreakers with an average age of ~45 years, reflecting a potential future weakness without a large fleet renewal.

Aker Arctic is currently developing the design for two A-Class Aker ARC 130 methanol-ready Bay of Bothnia icebreakers to be built for the Swedish Maritime Agency, initially planned to be delivered by 2027. There is currently no update on the construction status of the vessels. The project secured €30 million in European Union Winter Navigation Motorways of the Sea III funding to support the project.

Denmark

Denmark currently operates two Knud Rasmussen Class ice resistant Arctic security vessels, which patrol the waters of Greenland, where the vessels are capable of breaking the commonly found 40-centimeter sea ice in southern Greenland and 70-centimeter fjord ice, which is insufficient for deal with the Arctic ice developing farther north in Greenland. In a sign of strengthening Arctic security around Denmark, Greenland and the Faroe Islands, Denmark announced a \$4.3 billion Arctic and North Atlantic defense spending package in October 2025 which includes the acquisition of two new Arctic ships (initially identified as three in the 2025 Danish Navy plan to acquire new vessels), although no specifications are currently available. Speaking to the Danish public broadcaster DR, the Chief of Defense, Michael Hyldgaard, reflected the increase in Arctic and North Atlantic security missions by saying, “the task of the Armed Forces is to ensure security throughout the Kingdom - and, if necessary, to defend Greenland, the Faroe Islands and Denmark within the framework of Nato in all domains”.

Iceland

Iceland currently has no Polar class icebreakers and has a strategy that appears to rely on NATO allies.

Norway

Norway has surveillance and research interests in the Arctic, currently undertaken by one Polar Class research vessel (Kronprins Haakon) and an Arctic Patrol vessel (Svalbard).

Swedish company Viking Supply Ships’ PC6 and PC7 icebreaking anchor handling tugs are managed by Norway’s Sea1 and fly the Norwegian flag. The vessels generally operate in the short-term charter market oil & gas, offshore wind and ice management market.

Norway also charters vessels to conduct icebreaking

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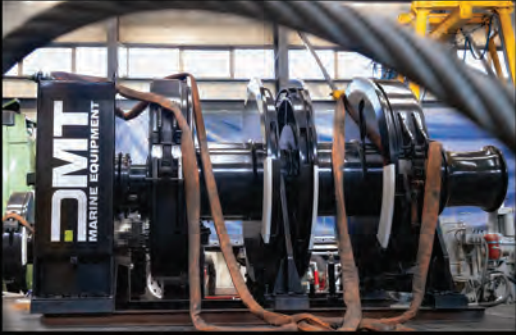
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services in fjords. Authorities invited tenders for two areas, Islo Fjord and Naeroyfjorden in 2025 for one year firm and one year of options. These tenders are supported by European Union funding. Baseline ice conditions are identified as mild sea ice. Polar Class vessels will not be required.

Norway is evaluating potentially upgrading existing its existing icebreakers or even procuring new capacity.

Other European countries

Only Germany and the UK have research and/or security icebreakers capable of operating year-round in the polar regions, the UK's 2002-built Arctic patrol vessel HMS Protector and

the PC5 polar research vessel Sir David Attenborough, delivered in 2021, and Germany's Polastern II PC2 research icebreaker, being built by Thyssen-Krupp with a planned delivery of 2030/2031.

France maintains polar presence through both research and polar tourism vessels the 2017-built PC5 icebreaker L'Astrolabe (built at Crist Poland and Chantier Piriou in France) and the 2021-built PC2 polar expedition cruise vessel Le Commandant Charcot, delivered from Vard (Romania and Norway).

Italy's 1995-built research icebreaker Laura Bassi can operate in the polar regions only in the summer months.

Estonia and Latvia operate Baltic ice-

breakers supporting keeping their ports ice free and open in the Gulf of Finland and Gulf of Riga.

Austria and Poland operate small port and inland icebreakers.

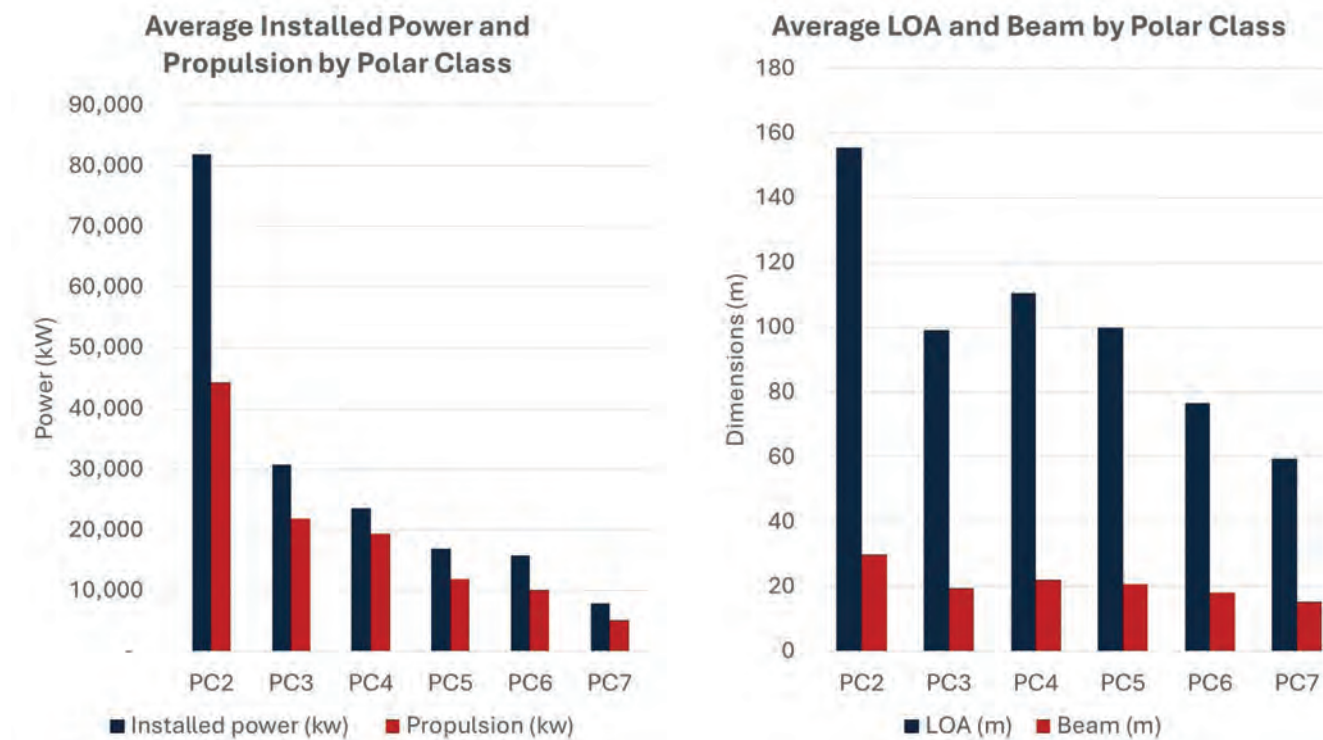
Outlook

Evolving ice conditions as a result of climate change have resulted in an increased interest in the Polar regions.

This interest can be seen in heightened commercial shipping activity in three Arctic shipping routes (Northwest Passage, North Sea Route and the not-yet open Trans-Arctic Shipping Route), increased focus on the exploration and production of oil & gas and subsea minerals (particularly

Technical Overview of the Icebreaker Fleet

It is no surprise that the kilowatt rating of installed power and propulsion increases by Polar Class, given the requirements for icebreaking increase. The average of the PC2 class is obviously influenced by Russia's nuclear icebreakers. Generally, LOA and beam increase as Polar Class requirements become higher, with the one anomaly of the PC3 class, influenced by some shorter Canadian icebreakers.



Source: Intelatus Global Partners

from Russia, China and the USA), enlarged border security and defense missions, more expedition cruise and tourism and additional scientific and data collection activity. All this activity requires icebreaking support.

Of the two Polar regions, the Arctic is more active in terms of icebreaking activity, although the Antarctic is seeing elevated scientific, data collection and security activity supported by icebreakers.

The Arctic powers, including Canada, Finland, Russia, and the United States maintain the largest polar icebreaking fleets. The challenge faced by these and other icebreaker owners is an aging fleet and a reliance on a somewhat concentrated supply chain. Major multi-vessel new build

programs are underway at various stages in Canada, Russia (impacted by sanctions) and the USA. Several other European, Asia Pacific and South American countries have also committed to single or small numbers of polar vessel procurement.

Finnish designers, builders and machinery and equipment companies hold a dominant position in icebreaking technology. Acquisitions (such as Davie of Helsinki Shipyard) and partnerships with overseas companies are likely to become increasingly important with Finnish companies within the sector. A good example will be the U.S. Coastguard's new icebreaker program which will see domestic yards tie up with Canadian and Finnish players.

With Russian yards impacted by

ongoing sanctions, collaboration with China is increasing. As a result, China has had increasing access to Russian icebreaker technology, including that for nuclear icebreakers. China is expected to continue its development of domestic icebreaker new building as it increases its presence in both the Arctic and Antarctic.

Polar icebreaker construction is often long in duration and high in capital expenditure. As a shipping segment, in numbers it is a comparatively small fleet. But the sector merits renewed interest from the supply chain as a result of changing conditions in the Polar regions - the result of which is more icebreakers will be built, older units will be life extended and the supply chain will have more opportunities.

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engines inc.

POWERING U.S. WORKBOATS FOR GENERATIONS + INTO THE FUTURE

By Greg Trauthwein

With the introduction of the JD18 and JD14 engines for maritime use, John Deere now offers a main propulsion package in the 800 hp range. Dave Hughes, Marine Director of engines inc., a long-tenured John Deere distributor, discusses the new engines and their applications in the workboat space.

engines, inc. has roots dating back nearly a century, a fourth-generation family leadership model that has built its reputation on more than just supplying engines. It provides reliable power, responsive service and deep technical support, anchored by a longstanding partnership with John Deere. Now it enters a new era of growth and capability, thanks to the introduction of two new marine engine platforms: the John Deere JD14 and JD18.

Founded in 1978 — but tracing its family business history with John Deere back to 1935 — engines, inc. has long played a leading role in powering America's working vessels, especially along the inland waterways. Today engines, inc. totals more than 100 employees and three facilities with nearly 300,000 square feet in Jonesboro, Arkansas.

Led by Dave Hughes in the marine sector, the company supports an annual throughput of 400–450 marine engine units, primarily John Deere marine auxiliaries, into the inland barge

and support vessel markets. But that profile is changing as engines, inc. positions itself for growth on the propulsion side, supported by new product lines and expanded territory. “engines, inc., is on pace for nearly \$100 million in annual sales,” said Hughes. “That speaks to how our footprint and the demand for our Industrial and Marine solutions have grown across the U.S., Mexico, and Central America.”

In maritime, every minute of downtime equals lost revenue, and engines, inc. has built its reputation not just on new engine supply, but on service responsiveness. The company supports a network of 20+ marine service dealers and maintains a fleet of factory-trained technicians ready to deploy from its home base.

“Our customers don’t want apologies, they want uptime,” Hughes emphasized. “We’ve got great dealers and employees who understand that—and who are willing to get on the road at 2 a.m. if needed to keep a vessel running.”

That service-first approach is reinforced by in-house training programs, dedicated product specialists, and strong technical alignment with OEM partners.

JD14 & JD18: New Maritime Muscle

The launch of John Deere’s JD14 and JD18 engines marks

“Our customers don’t want apologies, they want uptime. We’ve got great dealers and employees who understand that—and who are willing to get on the road at 2 a.m. if needed to keep a vessel running.”

Dave Hughes
Marine Director,
engines inc.

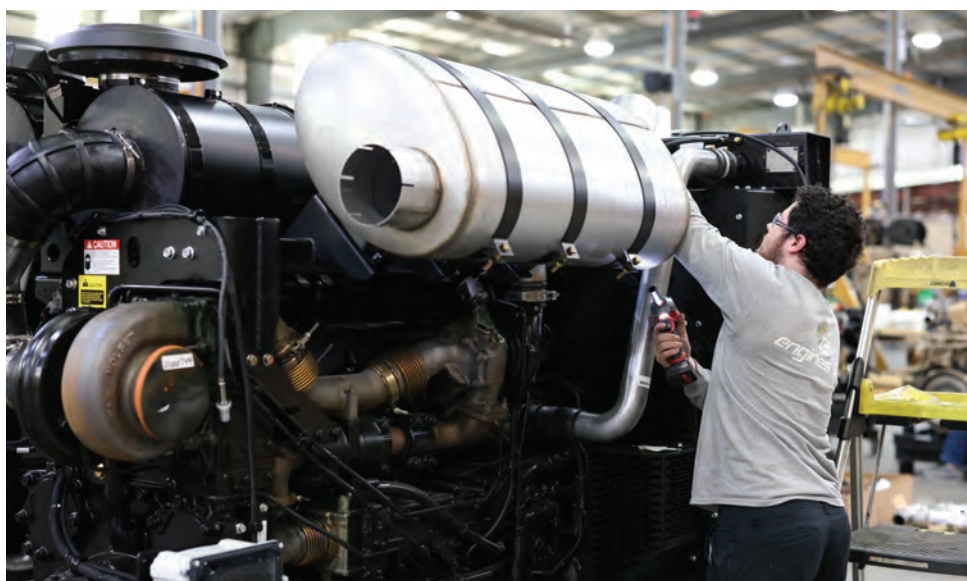


Image courtesy engines inc.

PROPULSION

a pivotal development in the company's marine offering. Historically offering propulsion engines but more recognized for its focus on auxiliary applications, John Deere now breaks into higher horsepower propulsion, offering new options for vessel operators looking for Tier 3 simplicity, extended durability and fuel efficiency.

"These engines are a major step forward," Hughes said. "With the JD18, we're looking at a constant-duty 800 hp engine that stays below Tier 4 thresholds, meaning no after treatment or urea — a big win for vessel operators."

The engines feature completely redesigned platforms including overhead camshafts and rear gear train configurations, which contribute to reduced noise, improved service access, and enhanced fuel economy. However, the JD14 model, is engineered with single-circuit cooling for easier keel-cooled or radiator-based installations — especially important in compact engine rooms.

"These aren't repurposed engines — they're built for the workboat sector from the ground up," Hughes added.

Though already deployed successfully in John Deere Construction, Ag, and Forestry, and industrial OEM applications like high-demand pump systems, the marine variants of the JD14 and JD18 are now being introduced for early vessel validation, with full commercial availability targeted for Q1 2026.

While the industry keeps a close eye on hybrids and alternative fuels, Hughes is pragmatic. "We're seeing diesel-electric systems gaining traction — modular gensets that scale with demand. But if you can achieve 10–20% fuel efficiency gains with the right diesel engine, that's often the most direct path to improving TCO [total cost of ownership]."

Whether it's rethinking propulsion packages, expanding service coverage, or supporting cutting-edge engine launches, Engines, Inc. remains grounded in a philosophy of partnership, uptime, and practical performance.

"Inland marine isn't just our market," Hughes said. "It's in our DNA. And with the JD14 and JD18, we're ready for the next chapter."

JD14 Marine Engine

Configuration: 6-cylinder, inline
Displacement: 13.6 liters
Power Range (Marine): 298 to 599 kW (400 to 803 hp)
Auxiliary (Variable Speed): ~300–500 hp
Propulsion (M1/M2 duty): Up to ~575 hp
Cooling System: Single-circuit for simplified radiator or keel-cooled installations

JD18 Marine Engine

Configuration: 6-cylinder, inline
Displacement: 18 liters
Power Range (Marine): 410 to 599 kW (550 to 803 hp)
Up to 522 kW (up to 700 hp) of uninterrupted power at the M1 rating and up to 599 kW (up to 803 hp) of power at the M2 rating.
Cooling System: Dual circuit or keel-cooled configurations available

JD14 and JD18 Highlights:

- An overhead camshaft design and hydraulic lash adjusters to achieve better valve fit and eliminate valve lash maintenance.
- A rear gear train that provides customers with up to two rear PTOs and capacity for auxiliary power.
- No SCR/DEF system required (avoids urea use)
- IMO Tier 2, EPA Tier 3, and EU RCD II certified
- Built for high-load, continuous-duty marine operation
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Image courtesy Jan De Nul

World's Largest Cable Layer

The CMHI Haimen shipyard in China launched for Jan De Nul its newest cable-laying vessel: the **Fleeming Jenkin**, which will be used to install subsea cables for the transmission of renewable energy. It has a loading capacity of 28,000 tons, reportedly making it the world's largest of its kind. Delivery is scheduled for the second half of 2026. With its capacity and a length of 215m, the ship is designed to install longer and heavier cables in ultra-deep waters up to 3,000 meters. Besides the Fleeming Jenkin, Jan De Nul is also building an identical sister ship, William Thomson.

Once operational, it will start her first assignment: the 2GW Program by TenneT, the grid operator for the Netherlands and large parts of Germany, which debuts a new generation of off-shore grid connection systems that can each transmit up to two gigawatts. This is more than double the capacity of existing connections, usually between 700 and 900 MW. Fleeming Jenkin will install export cables on four of these 2GW connections, bundling and laying four cables together. In step with the launch, Jan De Nul also announced a new vessel to protect subsea cables: the **George W. Goethals**, which will be Jan De Nul's third rock installation vessel capable of transporting more than 30,000 tons of material. Highlights include:

- **Cable-carrying capacity of 28,000 tons:** It will be equipped with three cable carousels (2 on deck, 1 below) and a large hold for fiber optic cables, capable of laying up to four cables simultaneously.
- **Cable tensions up to 150 tons:** On the aft deck, the vessel is equipped with a chute and a cable-laying wheel. In combination with the tensioners, the chute allows installation of cables in shallow waters, while the cable-laying wheel makes installation at great depths more efficient. The tensioners enable the vessel to handle and control cable tensions up to 150 tons.

- **Green technologies:** The vessel is an Ultra-Low Emission vessel (ULEv). ULEv is an advanced dual exhaust filter system which removes up to 99% of nanoparticles from emissions using a diesel particulate filter and a reduction system for nitrogen oxides (NOx). The engines can run on biofuel and green methanol, reducing CO₂ emissions.
- **Electric Hybrid vessel:** The hybrid power plant combines the generators with a 2.5 MWh battery and drive technology, designed for peak shaving, load smoothing, spinning reserve and optimized engine loading.

Fleeming Jenkin Main Particulars

Owner	Jan De Nul
Shipbuilder.....	CMHI Haimen
Maximum cable load	28,000 t
Turntable capacity	2 x 11,000 t + 1 x 7,500 t
Length o.a.	215 m
Breadth	40 m
Draught loaded	9.75 m
Draft empty	5.5 m
Propulsion power	4 x 2,600 kW Azimuth thrusters
Bow thruster power	3 x 2,100 kW
Retractable thruster power	2 x 2,600 kW
Total installed diesel power	30,600 kW
Speed max.	13.5 knots
Accommodation	120 persons
Deck carousel	2 x 11,000 t
Inner diameter	8 m
Under deck carousel	7,500 t
Inner diameter	8 m
Fiber optic tanks	2 x 600 t
Tensioners Laying.....	3 x 50 t – 4 tracks
Loading.....	2 x 7.5 t – 2 tracks
Laying wheel integrated in stern chute	12 m diameter
Offshore cranes	100t AHC
ROVs	2 x WROV, 3,000m depth rating
Winch	150t AHC abandonment & recovery winch

Sofar Ocean launches Wayfinder Voyage Simulator

Sofar Ocean launched Wayfinder Voyage Simulator, a first-of-its-kind voyage planning tool. Part of Sofar's broader Wayfinder Platform, it is designed to allow operators, commercial teams, and chartering desks to instantly generate and evaluate unlimited voyage scenarios, with each scenario based on Sofar's marine weather forecasts, vessel-specific performance models that update daily based on actual operations and the latest market conditions, such as daily hire rates and fuel costs.

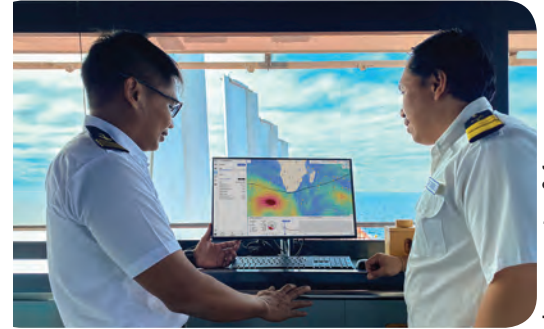
"Voyage planning tools have not kept pace with the speed and complexity of modern shipping markets," assesses Dennis Rong, Head of Product at Sofar. "We saw an opportunity to change this dynamic; not just by improving existing workflows, but by bringing real-time

ocean intelligence to the forefront of voyage planning and simulation."

Wayfinder Voyage Simulator seeks to transform voyage planning from multiple hours of spreadsheet guesswork into just seconds of intelligent analysis, via a straightforward process:

Select a vessel

- Upload a route or choose ports
- Adjust inputs (e.g. departure time, RPM, RTA, etc.)
- Create a simulation to evaluate arrival time and real-time voyage economics — time, fuel, emissions, cost, etc.
- Repeat and compare — create unlimited simulations across voyages



Images courtesy Sofar

and vessels

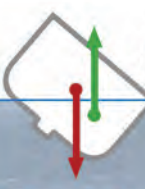
Wayfinder Voyage Simulator adds to the expanding suite of solutions within Sofar's broader Wayfinder Platform. For current clients such as MOL Group, Berge Bulk and the U.S. Navy, in 2024, Sofar claims that Wayfinder Voyage Optimization delivered customers 5.5% average fuel savings across key global routes.

Wearable Robots: Fabric Muscle"

The Korea Institute of Machinery and Materials (KIMM) unveiled a breakthrough in wearable robotics: an automated system that continuously weaves ultra-thin shape memory alloy (SMA) yarn —each strand one-fourth the width of a human hair — into lightweight, high-strength "fabric muscles." Weighing only 10 grams yet capable of lifting 10–15 kilograms, the material enables mass production of flexible actuators that move naturally with the human body. With it, KIMM researchers created the world's first **clothing-type wearable robot that simultaneously assists the elbow, shoulder, and waist, weighing under 2 kilograms and reducing muscle effort by more than 40%.** A separate 840-gram shoulder-assist version improved mobility by over 57% in clinical trials with patients suffering from muscular weakness. Dr. Cheol Hoon Park, Principal Researcher at KIMM's Advanced Robotics Research Center, said the breakthrough "lays the foundation for truly wearable robotic clothing that enhances human capability across multiple industries."



Credit: Korea Institute of Machinery and Materials (KIMM)



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Tech Files

Latest Products & Technologies

Techcross: 5,000 Cumulative BWMS Orders

At the end of September, Techcross announced that cumulative orders for its main product, the Ballast Water Management System (BWMS), had surpassed 5,000 vessels. This milestone, achieved 19 years after securing its first order in December 2006, marks a world-first record. Founded in 2000, Techcross has consistently pioneered world-first achievements by focusing on water electrolysis technology. Following the International Maritime Organization's designation of the Ballast Water Management Convention in 2004, Techcross became the first company in the world to obtain basic approval for a BWMS in 2006. In 2009, Techcross successfully installed the world's first explosion-proof system, and in 2010, received the order for a large-scale system from a VLCC vessel. In terms of order status, Greece accounts for the largest share at approximately 22% based on shipowners. Japan demonstrates a remarkably high repurchase rate, with more than 100 vessels ordered from a single shipyard. While orders have been balanced across vessel types, recent years have been a notable increase in demand for high-value-added vessels, such as VLCCs and LNG carriers. Techcross's best-performing year to date was 2022, when annual shipments reached nearly 800 vessels. With the completion of its Busan factory in 2015, Techcross established the world's largest BWMS production facility, capable of manufacturing up to 1,000 units annually—a level it has practically achieved in production.

However, the journey was not without challenges. In 2013, an operational issue arose onboard due to improper equipment handling, triggering industry rumors and a difficult time. Techcross responded swiftly—not only resolving the issue but also voluntarily recalling installed products to prevent recurrence. Using this crisis as a turning point, the company established training centers and systematic programs to provide thorough education in equipment operation and maintenance, laying a stronger foundation for growth.

These efforts have paid off: sales increased from 3.5 billion KRW in 2009 to 287 billion KRW in 2022, representing an 81-fold increase. In 2025, Techcross has once again achieved a historic milestone by surpassing 5,000 cumulative BWMS orders, while evolving beyond product sales to develop and deliver digital solutions and services. Moreover, as part of its commitment to a sustainable future energy, Techcross has expanded into the green hydrogen business, aiming for its next leap forward as a comprehensive environmental company.



Anschütz Autonomics

Anschütz launched its new line of solutions for autonomous navigation and mission automation under the name Anschütz Autonomics. Anschütz Autonomics is built on certified and operationally proven components. It enables safe and precise autonomous navigation, as well as automated tactical operations that can be monitored and remotely controlled from shore-based centers.

The system comprises two core elements: The SYNAPSIS Autonomics Navigation Suite enhances the capabilities of established integrated navigation systems by incorporating optical target tracking, COLREG-compliant collision avoidance, and advanced motion control for accurate maneuvering and station keeping. SYNTACS Autonomics automates mission execution, including threat and doctrine management, tactical behaviors, and payload integration.

Together, Anschütz Autonomics provides a range of proven functionalities, including:

- High-speed track and speed control
- Dynamic collision avoidance in accordance with COLREGs
- Targeted interception and reconnaissance
- Automated shadowing and escorting of high-value or suspicious targets
- Data fusion into a common operational picture
- Full remote control from mobile tactical centres

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A blue Hougén 2x2 MAG DRILL is shown in operation, drilling into a metal block. The drill is a low-profile, handheld tool. A red starburst graphic with the word 'NEW!' is in the top right corner. A vertical text on the right side reads 'HMD2X2 - 0202101'. A small American flag logo with 'Made in USA' is in the bottom right corner.

ESAB Checkmaster 600R Resistive Load Bank

ESAB introduced the Checkmaster 600R resistive load bank for simulating GMAW, AC/DC GTAW, SMAW and SAW arc welding processes from 150 to 600 amps. When linked with the ESAB WeldScanner multipurpose recording and measuring device, minimal user intervention is needed for calibration and validation, leading to time efficiency. Integration with the WeldScanner allows parallel operation of three Checkmaster 600R units, automatically switching resistive loads simultaneously. This streamlines large-scale measurement tasks and supports calibrations up to 1800 amps, common in SAW applications.

The Checkmaster 600R is compliant with standards that address welding equipment verification and calibration such as IEC 60974-14, AWS B5.4 and ISO 17662. Load banks are essential for compliance with AWS, AISC and ASME certification programs, which require a quality manual that documents how welding equipment is calibrated to control fabrication quality and verify compliance with Weld Procedure Specifications.



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Survitec Debuts Next-Gen High Expansion Foam System

Survitec unveiled its next-generation, high-expansion foam fire suppression system, engineered to deliver higher produced foam output at lower operating pressures. The system also reduces both installation and through-life costs for shipyards and ship owners.

The breakthrough is in a redesigned generator that achieves greater foam production at significantly lower feed pressures.

The new foam generator design incorporates a series of advances that collectively improve efficiency and reduce overall system size. The optimized nozzle alignment ensures full use of the generator net, eliminating blind spots to ensure maximum foam output. A new rotary element improves discharge efficiency, and a redesigned impeller draws more air into the generator and distributes the foam solution more effectively. This new configuration reduces the pressure required to generate the foam and achieves a higher and more consistent expansion rate.

Fred Harris – 1944-2025

Frederick Joseph Harris of Mystic CT, passed peacefully at 5:47PM on 10/24/2025, with his family by his side. “Fred” was born on 11/25/1944 at Framingham Union Hospital to Frederick Everett and MaryRosa Camilla Harris.

Fred received his bachelor’s degree in Marine Engineering from **Maine Maritime Academy** (with Honors) in 1967. Upon graduation, Fred was commissioned in the U.S. Naval Reserve with the obligation of sailing in the **U.S. Merchant Marine**. In the Merchant Marine, Fred sailed on various U.S. flag vessels, most notably aboard the SS Transglobe - the most decorated American merchant ship of the Vietnam War. Following his sailing career, which he completed as Chief Engineer, he entered Babson College, where he received his MBA in 1972. Soon after graduation, Fred began his shipbuilding career as a senior systems engineer for **Electric Boat** in the **TRIDENT Nuclear Submarine** Project. Fred joined EB as an engineer in the OHIO Class nuclear submarine program with increasing responsibility for the design, engineering and procurement of equipment for the nuclear propulsion plant associated with the delivery of 18 Trident Class ships. Fred led the Virginia Class Program Management organization for the submarine design-build concept leading to on time delivery of the 1st Virginia Class attack submarine, VIRGINIA, SSN 774, in 2004. Fred then led the design and engineering effort to incorporate Virginia Class lessons learned into the construction program to support the unique requirements associated with the 3rd Seawolf Class submarine, USS JIMMY CARTER, SSN 23 at which time, he was promoted to VP of programs.

In 2006, Fred was promoted as the President of **General Dynamics National Steel and Shipbuilding Company** (GD-NASSCO) responsible for the

design, engineering, procurement and construction of several classes of Naval Auxiliary Surface Vessels for the United States Navy (USN) and the Military Sealift Command (MSC) and for multiple designs of cargo and tanker surface vessels for commercial US shipping customers involved in the Jones Act US shipping trade. Major military and commercial ship program accomplishments include design, engineering, procurement and construction associated with: Fourteen dry cargo and ammunition ships of the LEWIS and CLARK Class (TAKE) for the USN/MSC - rescuing the program from construction delays and cost overruns to one of the most successful shipbuilding programs in Naval history by invoking significant process and productivity improvements leading to an unprecedented ship schedule discipline and cost reduction effort. Multiple Mobile Landing Platforms (MLP) - later renamed Expeditionary Sea Base (ESB) Naval auxiliary fleet support ships. Multiple crude oil tankers, product carriers and cargo surface vessels for several US shipping companies involved in US Jones Act trade.

In 2013, Fred was assigned as the President of **General Dynamics Bath Iron Works** responsible for the design, engineering, procurement and construction for two classes of the USN's destroyer programs including the Arleigh Burke Class advanced flight guided missile destroyers and the Zumwalt Class advanced multi-mission stealth destroyers. Fred retired from GD-Bath in December 2016. Following GD retirement, he provided technical consulting services in support of ship construction to several nations, including France, Spain and Australia

Fred’s thorough knowledge of ship construction processes, design and build practices, and his openness to seek out



General Dynamics - NASSCO

best business practices earned him a succession of promotions at Electric Boat, including Vice President and VIRGINIA Class Program Manager, Vice President of Programs and Sr. Vice President of Programs. Under Fred’s leadership, the VIRGINIA Class Program earned a reputation as the premier shipbuilding program in the U.S. Navy, with the first submarine of the class completed within three months of the original planned delivery date set 10 years earlier.

In recognition of his accomplishments in the Shipbuilding industry, Fred held many non-GD leadership positions and received numerous honors, including:

- Maine Maritime Academy Outstanding Alumni Award (2000)
- Past Board Chair, American Shipbuilding Association
- SNAME William M. Kennedy Award (2002)
- Harold E. Saunders Award, given by the American Society of Naval Engineers (ASNE), for his significant contributions to naval engineering (2010);
- SNAME Vice Admiral Emory Scott Land Medal (2012)
- The Royal Institution of Naval Architects (RINA) William Froude Medal (2012),
- Maine Maritime Academy Honorary PhD (2010).



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- SEMINAR ROOMS 1A, 1B
- SEMINAR ROOMS 2A, 2B



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HALL 3

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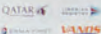


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A DREDGING RENAISSANCE

A COMPETITIVE, GROWING, AND STRATEGIC JONES ACT INDUSTRY

By William P. Doyle, CEO, Dredging Contractors of America

The United States dredging industry stands as one of the most competitive, efficient, and strategically vital sectors of the maritime economy. As part of the Jones Act fleet—the original Build America, Buy America industry — it not only strengthens our ports and waterways but also anchors thousands of middle-class jobs, spurs shipbuilding across the Gulf and East Coasts, and delivers exceptional value for taxpayers.

The last several years have ushered in a quiet renaissance. Dredging firms large and small are modernizing their fleets, expanding capacity, and deepening critical U.S. channels faster than ever before. This work underpins both national commerce and maritime security, ensuring that U.S. vessels, U.S. workers, and U.S. shipyards remain at the center of our nation's infrastructure future.

A Competitive Industry

According to the 2024 U.S. Dredge Report, 56 companies were awarded U.S. Army Corps of Engineers dredging contracts, 20 large businesses and 36 small businesses. This underscores the industry's strong presence both in capability and competition. The report, authored by Michael Gerhardt, analyzed 136 projects and compared winning bids to government estimates and the Government Estimated Awardable Range (GEAR). The findings were remarkable:

- 88 bids came in below the

- government estimate
- 123 projects (90%) were awarded below the GEAR
- Average savings: 25% per project
- Total estimated taxpayer savings: nearly \$829 million

Total contract awards reached an all-time high of \$2.4 billion in 2024, extending a three-year growth streak. Roughly 41% of all awards went to hopper or dustpan dredges, with the balance supporting cutter suction, clamshell, and other dredging work.

Small businesses also had a landmark year, winning \$442 million in contracts—an 85% increase year-over-year and the highest share (31%) in a decade. Each project attracted an average of three bidders, with some seeing as many as six—an unmistakable sign of a vibrant, competitive marketplace.

A Deepening Gulf: Alabama's 50-Foot Achievement

A prime example of U.S. maritime progress is the Port of Mobile, which this fall celebrated the completion of its channel deepening to 50 feet—a first for any Gulf of Mexico port. The MV Sakizaya Power was the first deep-draft bulk carrier to call the newly deepened port, marking a major milestone in American maritime infrastructure.

This achievement stemmed from bold cooperation at every level of government.

- In 2019, Alabama enacted the

Rebuild Alabama Act (HB 2), raising the gas tax by ten cents per gallon to fund critical transportation projects. Under that law, \$11.7 million annually was dedicated to port and dredging improvements, accounting for about 25% of total funding.

- On the federal side, the then Alabama U.S. Senator Richard Shelby secured \$274.3 million through the FY2020 U.S. Army Corps of Engineers Work Plan.

The Corps and private dredging firms moved swiftly—and by October 3, 2025, the Alabama Port Authority announced that the Mobile Ship Channel had officially reached 50 feet. Work now continues to widen the turning basin near the Mobile Container Terminal, with dredged material being reused for shoreline restoration on Dauphin Island—the process known as beneficial use of dredged material.

Billions in Investment in New U.S.-Built Vessels

U.S. dredging companies are investing billions in new Jones Act-compliant vessels, strengthening both domestic capacity and national shipbuilding.

The Dutra Group of San Rafael, California, is building a 10,464-cubic-yard trailing suction hopper dredge, the Adele, at Eastern Shipbuilding Group in Panama City, Florida. Scheduled for delivery in late 2028, the Adele will feature a V-shaped hopper, advanced energy-efficient propulsion, and 13,290



Earlier this summer Conrad Shipyard delivered the hopper dredge Amelia Island to Great Lakes Dredge & Dock Corporation (GLDD).

Image courtesy GLDD

horsepower of total installed power. The vessel's design combines performance, fuel efficiency, and quick offloading capability—all hallmarks of modern U.S. dredging technology.

West Coast based Curtin Maritime of Long Beach is nearing completion of its next-generation DB Catalina, a hybrid-electric clamshell dredge modeled after its successful DB Avalon. Built in partnership with The Shearer Group, Inc. of Houston, the DB Catalina features a 100-cubic-yard bucket, a 160-metric-ton capacity, and fully electric plug-in capability for zero-emission operations.

In September 2025, Curtin Maritime expanded further, announcing a \$160 million partnership with Arc, an electric power boat building company, to construct a new fleet of hybrid-electric ship-assist tugboats in collaboration with Snow & Co. Shipyard. Each tug will deliver more than 4,000 horsepower powered by a 6 MWh battery system, marking a major step toward decarbonized U.S. port operations.

The story of America's dredging industry is one of competition, innovation, and national strength. Every dredge contract, every U.S.-built vessel, and every deepened channel reinforces the foundation of a self-reliant, modern maritime economy.

In an era when global shipping is dominated by foreign fleets and State-subsidies, the U.S. Jones Act dredging industry remains proudly American-built, American-owned, and American-crewed—and it delivers measurable returns to taxpayers. With over \$3 billion in new vessel investments, record levels of competition, and close cooperation between the federal government and private industry, this sector exemplifies what Maritime Made in America truly means.

As the nation continues to rebuild its shipyards, expand port capacity, and strengthen its maritime workforce, the dredging industry will remain at the heart of that progress—keeping America's waterways open, resilient, and ready for the future.

The Author



Doyle

William P. Doyle is Chief Executive Officer of the Dredging Contractors of America. He previously served as Executive Director of the Port of Baltimore and as a U.S. Federal Maritime Commissioner. A graduate of the Massachusetts Maritime Academy and Widener University Commonwealth Law School, he is a licensed officer in the U.S. Merchant Marine and a member of the Marine Engineers' Beneficial Association.

2026 Editorial Calendar

January 2026

Ad close: January 7, 2026

MARITIME POWER

e-Magazine Edition

From diesel to hybrids, alternative fuels to electric/battery, changes in the maritime powertrain impact everything from design to construction to lifecycle maintenance.

Tech In Focus:

Fuels & Lubes

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- Passenger Ferries
- Icebreaker Design, Construction & Equipment
- Offshore Renewable Energy
- Coatings & Corrosion Control

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- IPF 2026 – New York, NY
- Sea Japan – Tokyo
- Asia Pacific Maritime (APM) 2026 – Singapore
- PVA Maritrends – Covington, KY
- Breakbulk Europe 2026 – Rotterdam

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From Weather Routing to Cargo Loading to Voyage Tracking to Condition-Based Monitoring, the digital revolution continues to revolutionize the waterfront.

Tech In Focus:

Robotic Hull Grooming Solutions

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- Offshore Energy
- Floating Power Production
- Towboat, Tugboat, Barges
- Deck Machinery & Cranes

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- Sea-Air-Space – National Harbor, MD
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- Wind Europe 2026 – Madrid
- Mari-Tech 2026 – Victoria, BC
- Inland Marine Expo 2026 – Nashville

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GREEN MARINE

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From Hull Design to Machinery Optimization to Alternative Fuels, the maritime 'green' push is premised on fuel economy too.

Special Feature:

Thought Leadership: Classification Roundtable

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DREDGING

- Marine Salvage
- Ship Repair & Conversion Projects
- Maritime Safety Equipment
- Waterjets, Thrusters & Propellers

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- WEDA Dredging Congress & Exhibition
- Green Marine – Quebec City Convention Centre
- Cruise Ship Interior Expo – Miami, FL
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July 2026

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U.S. NAVY, COAST GUARD & GOVERNMENT SHIPS

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In Focus:

Fast Attack & Patrol Craft Builders

August 2026

Ad close: July 22, 2026

SHIPBUILDING

- Hybrid Propulsion Solutions
- The Modern Marine Bridge
- Ballast Water Management
- Shipyard Tools: Cutting & Welding Equipment

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- SMM – Hamburg, Germany
- Electric & Hybrid Marine World Expo North America
- SNAME

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- Thought Leadership: U.S. Maritime Academy Leadership
- Cyber Security
- Cruise Port & Terminal Innovation
- Ferry Boat Review

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- Interferry 2026

November 2026

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- Emission Reduction Technology
- Deck Equipment, Winches, Cranes
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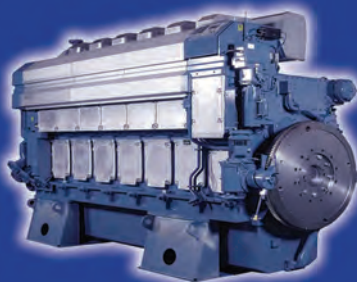
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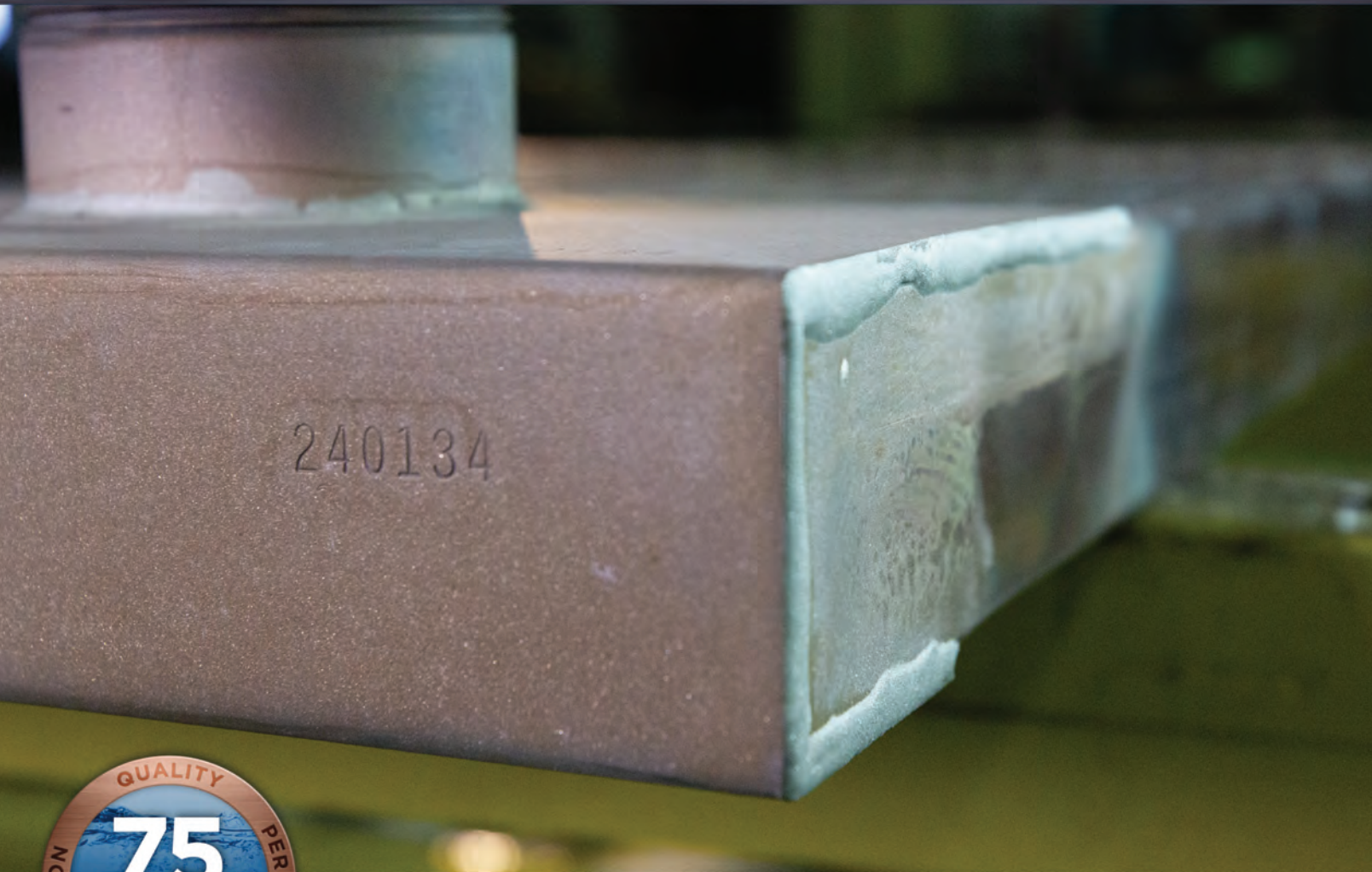
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