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MARITIME REPORTER AND ENGINEERING NEWS

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Crutchfield

Fifth-Gen Family Leader has 150-year-old Colonna's Shipyard Firing on all Cylinders

Since 1939 | Number 8 | Volume 87

U.S. Shipbuilding
American Maritime Dominance Requires a New Ecosystem

Asian Shipbuilding
China Dominates

Icebreakers
Shipbuilder Alliances Form

USCG Cyber Secure
5 Essentials for Compliance

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Photo on the cover: Colonna's Shipyard / Photo on this page: Birdon

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Shipbuilding is a foundational cornerstone of everything we cover here at *Maritime Reporter & Engineering News*, and ever since I first sat in this seat – since 1992; 33 years as of this edition and counting – never have I heard so much talk about reinvigorating the U.S. industrial base, rebuilding U.S. shipbuilding 'dominance' than I've heard in the first six months of 2025. To be succinct, that's more chatter and attention in six months than I've heard cumulatively in the last 32+ years combined.

But as the saying goes, *"BS walks, money talks."* This is not to say that all of the chatter, Congressional activites and Presidential executive orders is BS ... far from it.

As **Philip Lewis, Director of Research, Intelatus**, writes in the August 2025 edition of sister-publication *Marine News*:

Funding for some, but not all, of the above initiatives has been made available in the Big Beautiful Bill Act.

> *The initial importance of shipbuilding to the White House was reflected in the position of the National Security Council's (NSC) Senior Director for the Office of Maritime and Industrial Capacity and NSC Chief of Staff in the White House. Under the Trump White House, this was the first time in recent administrations that the Office of Maritime and Industrial Capacity, supporting federal policy development and execution for shipbuilding, has been physically located at the White House. However, following the departure of some five out of seven senior staffers, it is understood that the shipbuilding activity will be moved out of the NSC to the Office of Management and Budget. It is unclear who is currently accountable for managing the development of the Executive Order. This reflects a potential loss of focus on commercial shipbuilding.*

This edition – from the cover feature [pg. 26] with **Colonna's Chairman & CEO Randall Crutchfield** to 'The Final Word' feature from **Bob Kunkel** [pg. 58], which says that *'American Maritime Dominance Requires a New Ecosystem'* – is all about shipbuilding.

Shipbuilding deals and developments are happening at speed, and the best means to keep abreast is via **MarineLink.com** and the various eNewletters that eminate from the website. Investment in U.S. Navy and U.S. Coast Guard fleets – newbuild and repair – is a given, and in the case of the latter the USCG received the largest funding package in its history, including nearly $9B for a fleet of icebreakers. This development, in turn has helped to inspire a massive influx, from all corners of the world, of shipyards seeking to create relationships, collaborations and even outright takeover proposals with U.S. shipbuilders.

But the opportunity at hand is not equal for all, as for the most part small- and medium-sized yards have not yet gotten clarity on how and when the money flow will impact their operations. With that, we profile the history, current workload and future prospects of a half-dozen ship and boat builders in this category, starting on page 40.

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Tip #65

TikTok Attention Spans, Lifelong Lessons: Training in the Age of Distraction

By Heather Combs, CEO, Ripple Operations

The modern mariner has changed. Today's crew members may be just as fluent in maritime procedures as they are in memes, video shorts, and social media scrolling. And while that brings tech-savviness and adaptability, it also introduces a very real challenge: shrinking attention spans. In a world of endless distractions and bite-sized content, how do you deliver training that actually sticks?

The answer isn't to fight it, but to embrace it. Modern training is increasingly more art than science, requiring creativity, empathy, and adaptability to truly connect with today's learners.

Reframing the Problem: It's Not Laziness, It's Design

Let's be clear; short attention spans aren't character flaws. They're the result of a content environment optimized for speed, novelty, and constant stimulation. Mariners raised on TikTok, YouTube, and rapid-fire notifications are simply accustomed to fast-paced, engaging, and intuitive content.

Traditional training modules, like long lectures, dense PDFs, day-long seminars, or even rigid, click-through LMS content, may have worked in the past, but they struggle to compete with the instant feedback and dopamine hits of a smartphone. When training feels like a chore rather than an experience, attention drifts and retention drops.

To be effective, maritime training must adapt its delivery to match how today's mariners naturally absorb information.

Microlearning: The Right Format for the Moment

Microlearning breaks down information into small, focused chunks that are easier to digest, retain, and revisit. Think:

- 2-minute videos explaining fire extinguisher types
- Flashcards covering emergency signals
- One-slide visual checklists shared during a toolbox talk
- Daily "Did You Know?" push notifications on a crew app

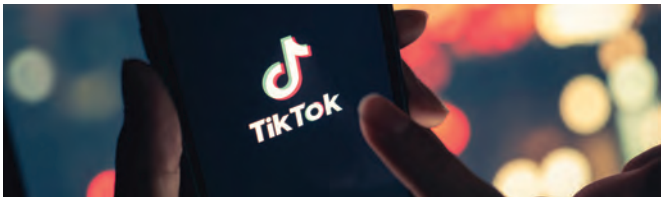
Short lessons delivered repeatedly and in context can be far more impactful than long sessions mariners tune out. These micro-bursts allow learners to retain key details, without mental fatigue.

The Power of Repetition and Timing

It's not just what you teach, but ***when*** and ***how often*** you reinforce it.

Modern learning science shows that spaced repetition (revisiting the same content over time) significantly boosts long-term memory. Use this principle at sea with:

- Weekly "safety moment" discussions



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- Daily radio-call pop quizzes
- QR codes posted near safety gear that link to 1-minute refreshers

Repetition, especially when done creatively, helps short lessons become long-term habits.

Train the Way They Scroll

If mariners are already used to short-form video and intuitive apps, lean into that medium.

- Replace bulky manuals with searchable, mobile-accessible knowledge bases
- Use memes or humor-based videos to drive home a serious point
- Incorporate swipe-friendly interfaces for self-check quizzes

Training should look and feel like the apps they already trust, without sacrificing accuracy or depth.

Create Attention, Don't Just Demand It

In a distracted world, attention is earned. Your training must be more than mandatory. It should feel immediately useful, visually appealing, and emotionally engaging.

That means:

- Telling stories instead of just citing rules
- Using real-life case studies and near-miss breakdowns
- Creating visual or interactive elements instead of long blocks of text

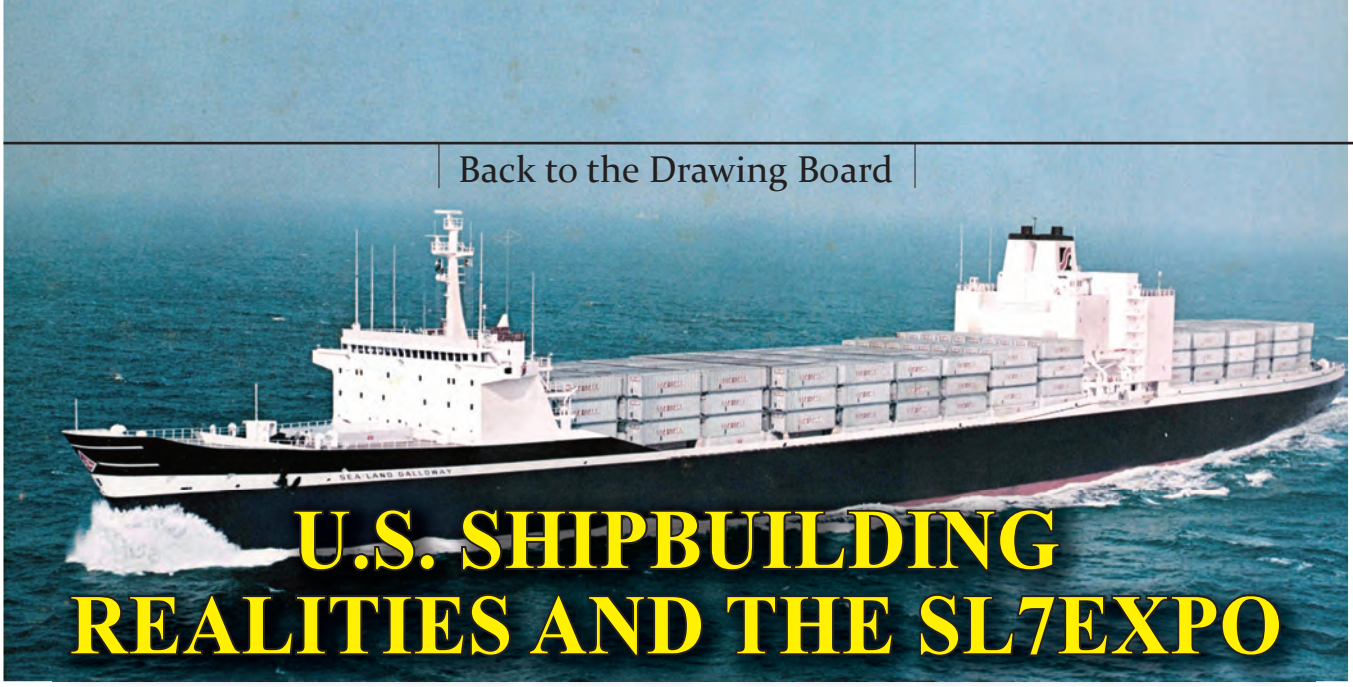
When the content respects their time and intelligence, mariners are more likely to engage with it.

Closing the Gap

The next generation of mariners doesn't need less training. Rather, they need smarter training. One that's built for their attention patterns, digital habits, and learning preferences. When designed with intention, even a 90-second lesson can lead to safer behaviors, sharper awareness, and stronger performance at sea.

Attention spans may be shrinking, but your training's impact doesn't have to.

Until next time, sail safely—and keep it short.



SL7 M&O: SS Sea-Land Galloway, Martin & Ottaway collection.

U.S. SHIPBUILDING REALITIES AND THE SL7EXPO

By Rik van Hemmen

Once again U.S. shipbuilding, or rather the lack thereof, has raised its head. There are those who say that U.S. shipbuilding is a train that has left the station (yes, a purposefully odd but correct metaphor), while others are hoping for a new dawn of U.S. shipbuilding dominance.

I know it can be done, but only if there is steel-eyed realism and an iron will to do it.

I also know that magazine editors hate lists, but I am going to irritate Greg by doing just that: creating a list of realities surrounding the proposed resurgence of U.S. shipbuilding.

1. The maritime industry deserves government focus and support. It is a huge and deeply underappreciated economic driver. Shipbuilding is one part of the game, and for the U.S. it is also an important existential issue with regard to defense capabilities.

2. The cost of ships is strongly related to the time it takes to build them. A ship that takes six months to build will cost only a fraction of a ship that takes two years to build. It is not a linear connection since the cost of materials does not change much, but it is strikingly powerful. Speed up production and the price drops.

3. Don't overfocus on other countries. Why? They are using today's technologies; only tomorrow's technologies can drastically change the game. For example, large commercial vessel construction is heavily reliant on welders. While foreign builders use robotic welders, if a ship can be built with just robotic welders this makes shipbuilding in the U.S. more viable. Improved robotic design can accomplish this, but so can improved ship construction design that facilitates increased use of robotics.

4. Don't get hung up on the numbers. Despite the numbers that are being thrown around with regard to the amount of ship construction in other countries, the U.S. is a potent shipbuilder. It simply doesn't build a lot of large steel ocean going ships. In certain shipbuilding categories the U.S. is reasonably competitive, generally on smaller, high-tech vessels produced in series.

5. Commercial series production, over extended periods of time, is THE magic bullet. It reduces costs, eases production efficiency investment, reduces supply chain costs and produces work force stability.

6. One Design, One Yard + Subsidies. There are many types of ships that can be built in large series and can benefit the country's trade. Some are large ocean going vessels for defense logistics, some are aluminum catamaran research vessels, others may be short-haul feeder container vessels, or intra-port micro cargo vessels. Pick a selection of vessels, but don't distribute construction of one design between different yards. The best bidder gets the entire series. One design, one yard, and see the subsidy comments in #12.

7. It's Electric. While we are at it, let's nail down the whole carbon conundrum and commit to U.S.-built electric drive in all U.S.-built vessels. As long as the shafts are turned by electric motors we can let the market and regulators figure out what supplies the electricity to the motors, whether it is coal, nuclear, methanol, ammonia IC, fuel cells, or magic mushrooms.

8. The customer is NOT always right. In the U.S. the customer is generally King, but if you make the customer King in shipbuilding you cannot stay in business. Any small customer demanded modification in series production is a death knell.

9. The next generation. Instead of making the customer King, it makes more sense to treat our young people like Kings. We have to reach out to young people and make it easy for them to enter the industry. This will require a lot of work, but it is probably the best investment we can make for our country, ourselves and our kids.

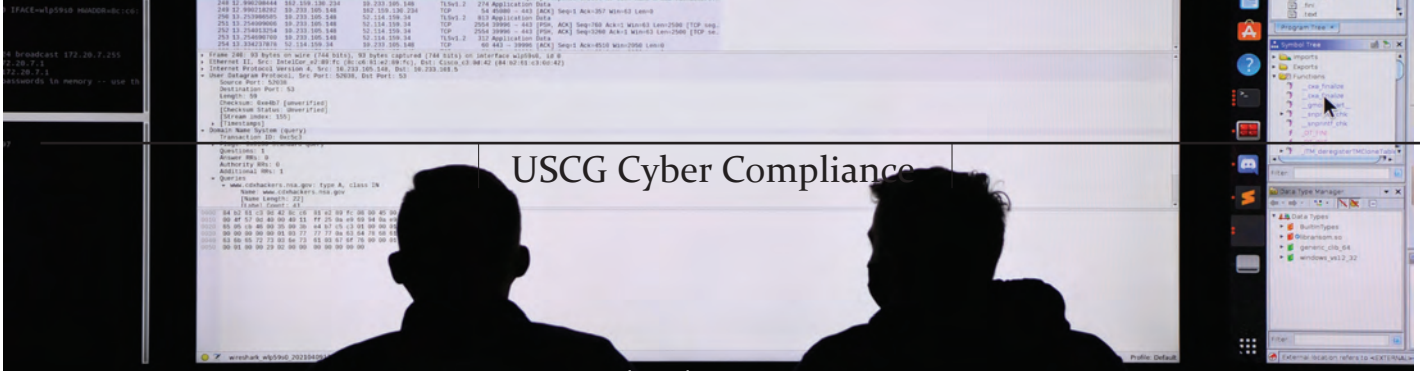
10. Build the supply chain. A shipyard is for assembly. We need to build a rugged material and equipment supply chain. That is a chicken and egg issue and can only be accomplished when a huge investment is made in U.S. ship construction. This is not 'hundreds of millions' rather the investment needs to be in the tens of billions.

11. In workforce development, the most efficient investment is social. You need people to understand and appreciate the industry before you can invest in hardware. Spend money on social programs first. Meanwhile any maritime job that requires drug testing and provides useless positives for marijuana use is an automatic non-starter. We need useful weed testing or young people will not sign on.

12. Subsidies and trade protection. All of the above can increase shipbuilding viability in the U.S. However, it still takes humans, and in the U.S., human workers tend to be more expensive, which means that the U.S. shipbuilding industry will always operate at an international disadvantage. This can be dealt with through some level of subsidy or trade protection, but this needs to be carefully applied. The subsidy needs to be tied to performance improvements in the industry over time. Simple construction cost differential subsidies will not work because humans will focus on maximizing subsidies and, like occurs in Navy shipbuilding, it will not increase production efficiencies. Be ruthless but predictable in the awarding and removing of subsidies. Think in terms of CAFE ratings and not in terms of farm subsidies.

Meanwhile, all of this needs to be explained to the public. Increases in Kings Point and state maritime academy funding cannot solve the problem. This needs to be a grassroots effort, an effort to bridge the light years between a young person in random locations around the country and their awareness of the maritime industry in general and the many educational and job opportunities within. We have a great opportunity to increase shipbuilding and maritime industry visibility by building national level exposition centers as suggested in the SL-7EXPO effort; Let's spend our money there first. It is cheaper than investing in hardware, and if we cannot find and attract the young people to fuel the industry's future, why bother wasting money on hardware?

For every column I write, ***MREN*** has agreed to make a small contribution to an organization of my choice. For this column I select SL7EXPO. Visit **www.linkedin.com/company/sl7expo** for more information.



FROM RISK TO READINESS:

5 Essentials for U.S. Coast Guard Cyber Compliance

Vessel operators must embed cybersecurity into their operational procedures to meet USCG 33 CFR Part 104, writes **Nicolas Furgé, President, Cyber, Marlink.**

U.S. Coast Guard photo

As cyber threats continue to grow in both scale and complexity, maritime stakeholders, from shipowners and operators to port facilities are facing new regulatory demands to improve cyber resilience.

The latest cybersecurity rules from the United States Coast Guard (USCG), amending parts 101, 104, 105 and 106 of 33 CFR Sub-chapter F, represent a major shift in how cybersecurity is addressed by U.S.-flagged vessels and U.S. maritime facilities regulated under the Maritime Transportation Security Act (MTSA), including ports and facilities on the Outer Continental Shelf.

These rules, effective from May 22, 2025, with full implementation by 22 May 2027, are not just about technology, they require operational and procedural changes to how maritime cyber risk is managed. Vessel owners and operators will need to go beyond basic IT/OT controls and adopt a structured approach to managing cyber risk within their broader vessel security programs.

Marlink has identified five essential steps to achieving compliance with the USCG regulations that vessel operators need to consider. Each step calls for specific actions needed for compliance and how to prepare for the implementation of the rules and how to maintain compliance.

A Phased Approach

To meet these requirements, vessel operators must take a step-by-step approach that includes assessment, planning, implementation, and ongoing monitoring. Marlink supports a phased strategy designed to make this process manageable and effective.

The first phase calls for a cybersecurity gap assessment, comprising a detailed review of a vessel's IT and OT environments, procedures, and current controls to identify regulatory gaps and technical weaknesses. The results are used to create a compliance roadmap that can be applied fleet wide.

Next, owners must develop a Cybersecurity Plan (CSP), documenting cybersecurity policies, access controls and response plans. Ongoing reviews and updates will be critical to maintaining compliance and adapting to emerging threats.

After completing phases one and two, operators must implement vulnerability scanning, periodic testing of cyber measures (which may include vulnerability scans or penetration tests), crew training and cyber drills tailored to each vessel.

While the regulation does not directly affect suppliers, it may indirectly impact them by requiring MTSA-regulated vessels and facilities to assess and manage cybersecurity risks associated with third-party vendors and service providers in their CSP.

Five Focus Areas

The compliance journey starts with identifying what's at risk. A risk assessment helps determine which onboard systems are most critical, what threats are most likely (like phishing or ransomware), and how an incident could impact operations.

The updated USCG rules require cyber risk to be addressed in the Vessel Security Plan. This includes documenting how risks are mitigated, how access is controlled, and how the crew is expected to respond to cyber events.

Operators must be ready to identify and report cyber events that may qualify as a Transportation Security Incident (TSI), a cyber incident that significantly disrupts vessel operations, safety, or the environment. These incidents must be reported immediately to the National Response Center.

The VSP should clearly define what constitutes a reportable event, how reporting will be handled, and who is responsible. Operators must have a documented incident response plan outlining the steps to contain, investigate, and recover from cyber events, including co-ordination across vessels and shore-based teams.

Each vessel or fleet must assign a Cybersecurity Officer responsible for managing cyber risks and ensuring ongoing compliance. This includes overseeing vulnerability assessments, managing incident response procedures, and ensuring that training and cyber drills are regularly conducted. The CySO must have the authority, training, and resources to effectively lead cybersecurity efforts.

Operators must implement technical and procedural controls to control access to critical onboard systems. This includes role-based access, authentication policies and the seg-

mentation of IT and OT networks to prevent lateral movement during a cyber event.

Remote access, especially by third-party vendors, must be tightly managed and logged. These access controls must be clearly defined in the VSP and supported by both technical enforcement and crew awareness.

Beyond Compliance

Meeting these new requirements will require investment to perform assessments, documentation and training. However, this must be set against the cost of non-compliance which span denial of port entry, regulatory penalties or increased insurance premiums. Cybersecurity readiness is also becoming a factor in vendor evaluations. Starting early in planning for compliance may help operators gain a competitive edge in an increasing risk-aware market. The new USCG cybersecurity regulations position cyber risk as a critical aspect of maritime safety. As part of its enforcement of the Maritime Transportation Security Act (MTSA), the USCG now requires cybersecurity to be addressed in vessel security planning, treating cyber threats with the same priority as physical ones like piracy or terrorism. hile the U.S. Coast Guard's final rule on Maritime Cybersecurity takes effect on July 16, 2025, it's important to note that the USCG has requested public comments on a potential two-to-five-year delay in implementation for U.S.-flagged vessels. The public comment period closed on March 18, 2025, and any decision to delay would require a separate rulemaking process. As of now, no official delay has been announced, but stakeholders should monitor for updates and proceed with preparations under the assumption that the original compliance dates remain in effect.

While compliance may seem complex, it presents a valuable opportunity to enhance security and demonstrate leadership in a rapidly evolving threat landscape. Starting with a gap assessment and building cybersecurity into the VSP moves operators from compliance toward true readiness.

Despite the provisions of the regulation and the specifics of the VSP, it remains the case that rules tend to reflect minimum achievable baselines rather than a complete solution. Partnering with a cybersecurity solutions provider experienced in protecting critical infrastructure can help prepare operators for compliance.

They can also help the operator to adopt a more proactive stance towards cyber security, moving from a reactive posture based on solid defense to a proactive stance that seeks to understand emerging threats, how to reduce them and how to meet USCG requirements.

A New Era for Maritime:
How Proactive Hull Grooming with EverClean Paves the Way for a Toxin-Free Future

The maritime industry, vital to global trade, is at a turning point. Pressures to reduce greenhouse gas emissions, prevent the spread of invasive species, and eliminate toxic discharges are mounting. Traditionally, antifouling (AF) paints—many of them toxic—have been used to combat biofouling, the buildup of marine organisms on hulls. But a new, more sustainable approach is emerging: proactive, robotic hull grooming. This article explores the history of hull coatings, the impact of biocidal paints, and how EverClean's robotic solution is helping steer shipping toward a greener future.

From Ancient Remedies to Toxic Coatings

Seafarers have battled biofouling for centuries, using tar, animal fats, and later oil-based paints. The 20th century saw the rise of synthetic antifouling coatings, especially those containing organotin compounds like tributyltin (TBT). While effective, TBT proved devastating to marine life, causing deformities and widespread toxicity. It was banned by the International Maritime Organization (IMO) in 2008.

Copper-based paints—often with added biocides like cybutryne—replaced TBT. But copper also raises environmental concerns, especially in high-traffic areas where it accumulates and harms marine organisms. Cybutryne is now banned under the IMO's AFS Convention for its persistent toxicity.

The Hidden Costs of Traditional Antifouling

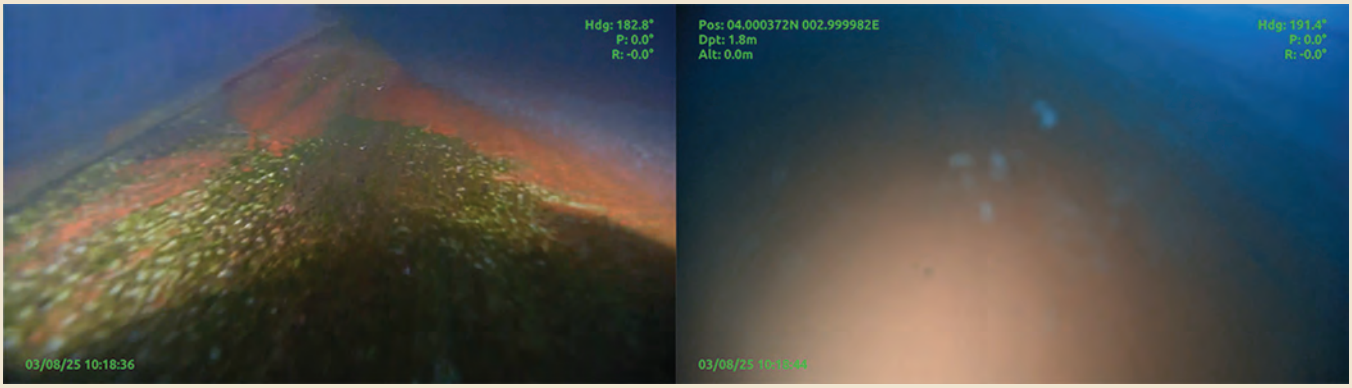
Beyond marine ecosystems, AF coatings pose risks to human health. Applicators face exposure to harmful chemicals through inhalation and skin contact. Effects include skin irritation, dermatitis, and conjunctivitis. Strict safety measures and PPE are required, and old coatings remain hazardous waste.

Even with AF paints, poorly maintained hulls are a key vector for invasive species. Biofouling also increases hull resistance, meaning more fuel is burned and more CO_2 is emitted. Frictional resistance can account for up to 90% of propulsion energy. In 2022, there were an estimated 858 million tonnes of CO2 emissions globally from the shipping industry. A smooth hull is proven to significantly cut these emissions.

Proactive Grooming: The EverClean Solution

The traditional approach to hull maintenance is often reactive: cleaning occurs only after significant fouling has accumulated. This reactive cleaning, typically performed with powerful machinery, damages coatings, leads to excessive discharge of paint particles and biocides, and may require the capture and disposal of contaminated waste. For foul-release coatings, which rely on a smooth surface for effectiveness, such aggressive cleaning can cause microscopic scratches, compromising their performance.

This is where a proactive grooming program, such as that



All images courtesy of Greensea IQ

Left side is taken by forward-facing camera before cleaning. The right side is taken by the aft camera after cleaning.

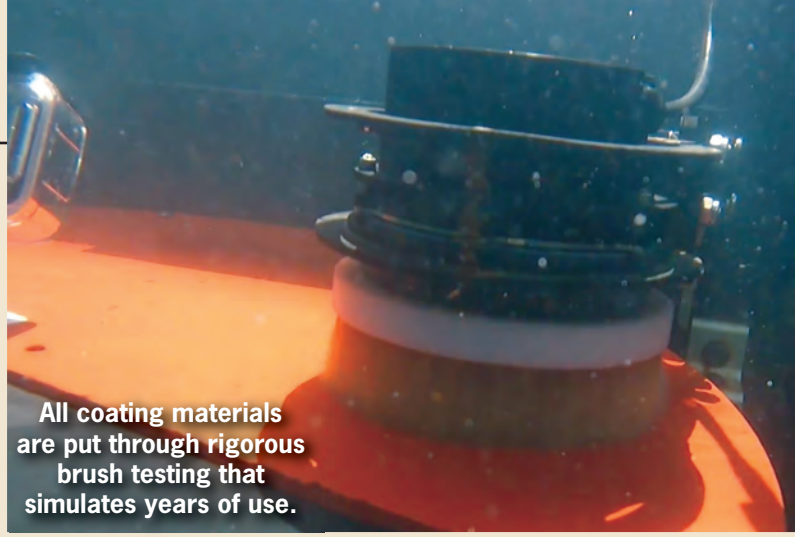
offered by EverClean, fundamentally changes the game. Hull grooming is defined as the "gentle, habitual and frequent mechanical maintenance of submerged ships' hulls" to keep them free from extraneous matter with minimal impact to the coating. Our EverClean robots are designed to apply the minimum force necessary to remove incipient fouling and biofilms without damaging the coating surface. By maintaining a consistently clean hull, EverClean offers a compelling array of benefits:

- Environmental Sustainability: Gentle grooming reduces discharge of biocides and paint particles, while helping curb the spread of invasive species.
- Reduced Emissions: An always-clean hull dramatically lowers frictional drag, directly translating to substantial fuel savings and a significant reduction in greenhouse gas emissions. Our research, and that of others, consistently shows that maintaining a smooth hull can lead to double-digit fuel efficiency improvements and corresponding CO2 reductions.
- Extended Coating Lifespan: Gentle, frequent grooming preserves the integrity of the hull coating, whether it's a biocide-based paint or a foul-release system. Unlike aggressive cleaning which strips away paint thickness, grooming helps maintain coating function without causing excessive wear or roughening of the surface. This prolongs the service life of the coatings, extending the time between costly dry-dockings.
- Enhanced Performance: Ships maintained with proactive grooming operate at optimal efficiency, avoiding the performance penalties associated with biofouling. This means consistent speed, reduced wear on machinery, and predictable operational costs.
- Occupational Safety: Automated grooming systems reduce the need for human divers to perform hazardous underwater cleaning, improving occupational health and safety within the maritime industry.

The Rise of Non-Toxic Alternatives and EverClean's Role

Looking ahead, the next frontier for sustainable hull maintenance goes beyond reducing biocides—it must also address the growing concern over microplastic pollution. Traditional cleaning methods, even when applied to non-toxic coatings, can release microscopic paint particles into the water. These particles contribute to long-lasting marine contamination. For EverClean, the future lies in a global fleet maintained with durable, non-eroding hard coatings that contain no biocides and are not designed to slough off over time.

Realizing this vision will require continued development of technology that enables gentle, comprehensive cleaning of the entire hull as often as necessary—without degrading the coating. EverClean's roadmap reflects this goal: advancing robotic systems capable of operating at high frequency and low impact, with the precision needed to support a shift to hard coatings. In parallel, coating manufacturers are developing new hard, non-eroding systems that forgo biocides and are designed to perform under regular, light-touch grooming.



All coating materials are put through rigorous brush testing that simulates years of use.

Together, EverClean and its industry partners are building the foundation for a future where the world's fleet can rely on durable coatings maintained proactively—rather than on paints that release toxins or gradually wear away in the water. By enabling vessels to move away from coatings that rely on gradual erosion or chemical toxicity, EverClean supports a long-term transition to hull maintenance practices that prioritize durability, environmental protection, and operational efficiency. The future of coatings is one where performance and sustainability are no longer in tension—and proactive grooming makes that future possible.

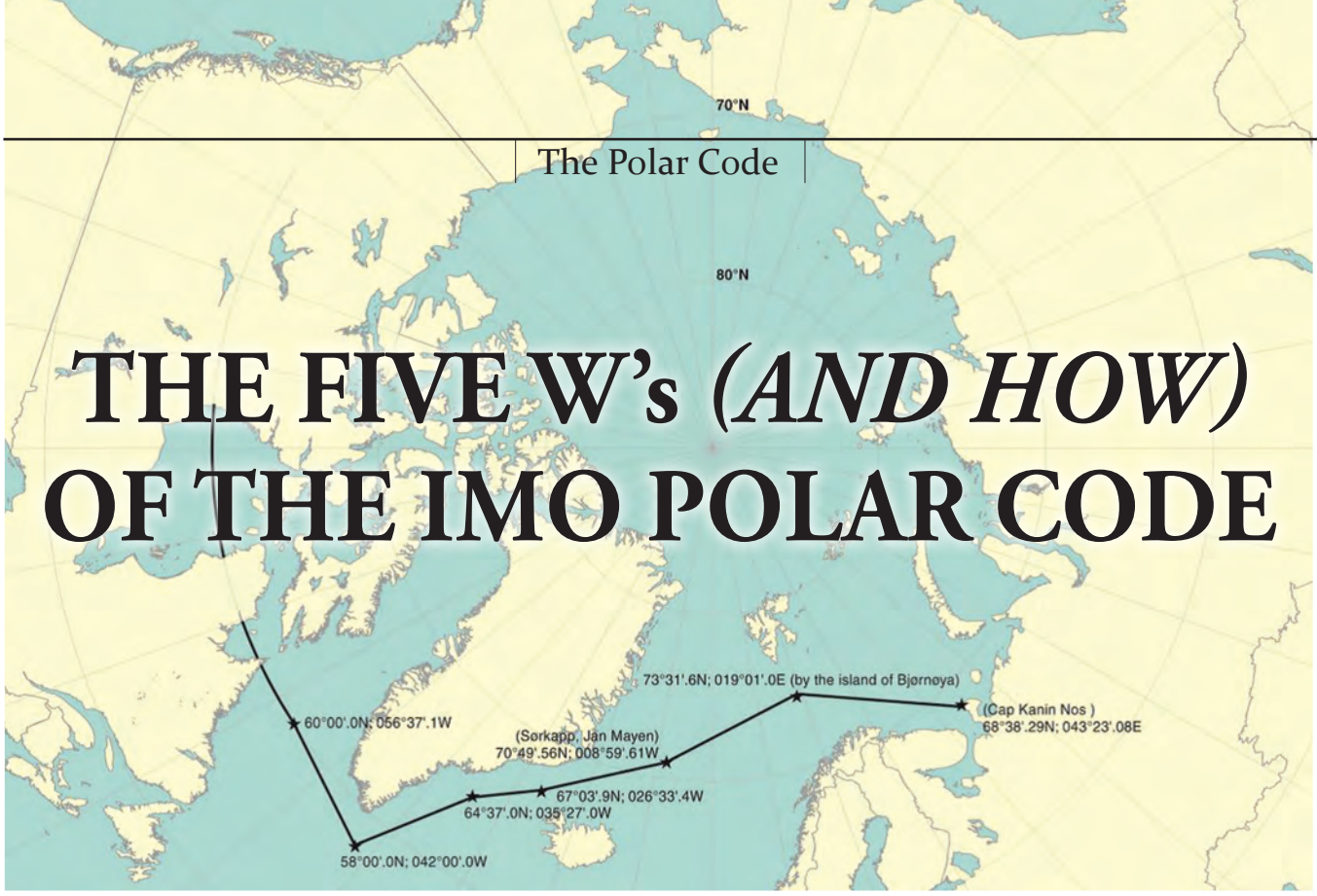
A Clean, Green Maritime Future

The path to a cleaner, greener maritime industry will require both innovation and commitment. As regulatory pressure grows and environmental impacts become more visible, ship operators are seeking solutions that reduce emissions, protect marine ecosystems, and enhance operational performance. EverClean offers a practical and scalable way forward. By shifting from reactive cleaning and toxic coatings to proactive, robotic grooming, the industry can maintain cleaner hulls, extend coating life, and lower fuel consumption—all while minimizing harm to the ocean. Though challenges remain, especially in moving toward durable, biocide-free coatings, EverClean is investing in the tools and technology to make that future achievable. A fleet that stays clean without polluting the water is no longer just a vision—it's an emerging reality. With EverClean, the maritime sector can meet its environmental obligations without compromising performance, helping to shape a sustainable future for global shipping. Clean ships. Clean seas. Forward together.

The Author

Glowacky

Paige Glowacky serves as the Director of Product for EverClean at Greensea IQ. Before her tenure at Greensea IQ and entry into the maritime sector, she held Product Manager positions at various late-stage startups within the technology and financial industries.



THE FIVE W's *(AND HOW)* OF THE IMO POLAR CODE

Since coming into force, the IMO Polar Code has had a positive effect on maritime operations in polar waters, write ***Dan Oldford*** *and* ***Ed Moakler****, ABS HETC, St. John's, Newfoundland and Labrador*

What is the Polar Code, When and Why did it come into force?

Polar regions have many unique hazards compared to warmer waters around the world. Since the earliest explorers sought to explore the Arctic and Antarctic by ship, many vessels have been lost due to sea ice, cold air temperatures and ice accretion.

Prior to the Polar Code coming into force there were no international regulations, just local territorial regulations. Starting in 1992, the global maritime community came together at the IMO to develop guidelines for marine operations in Arctic Ice Covered waters. These guidelines evolved to become the International Code for Ships Operating in Polar Waters (Polar Code). The IMO Polar Code came into force January 2017 for new ships, and after the first SLC intermediate survey, statutory under SOLAS, for all existing ships after January 2018.

The Code brings new safety and pollution prevention requirements for vessels operating in Polar waters. The mandatory requirement sections of the Polar Code were brought into force via amendments to SOLAS, MARPOL, and the STCW.

For Who and Where is the Polar Code applicable?

The Polar Code is applicable to all vessels with SOLAS certification that operate in polar waters as defined in the Polar Code. The IMO has recently published mandatory requirements for non-SOLAS vessels (including fishing vessels and yachts), aimed to increase the safety of those vessel's operations and mitigate environmental impacts in polar waters. The Polar Code defines polar waters, as outlined in the figures below.

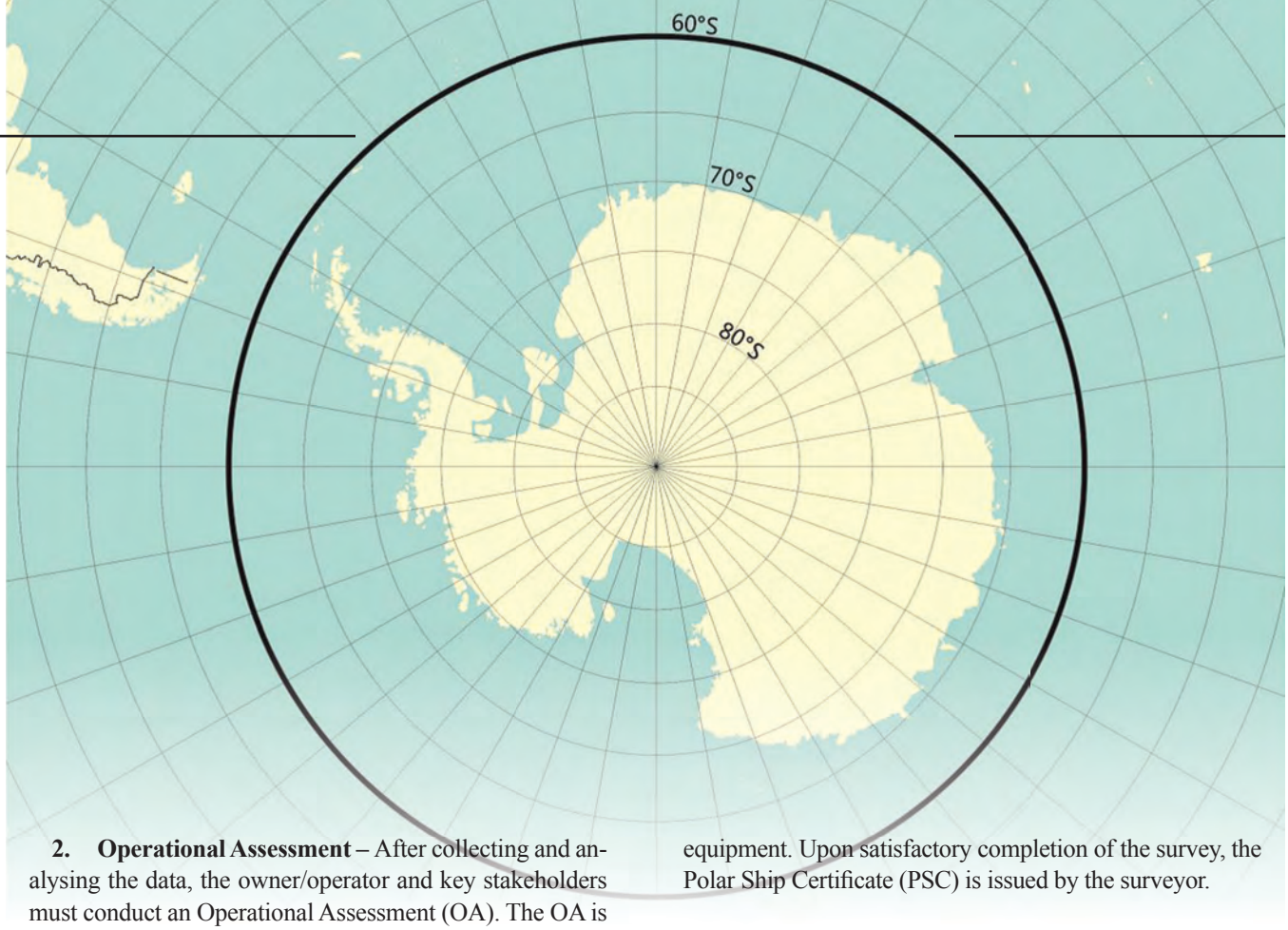
At first glance the Polar Code requirements can seem daunting and confusing, however a deeper dive into the requirements and processes reveals that the requirements are easy to understand because the IMO Polar Code is goal-based.

How to meet the requirements of the Polar Code?

Most of the IMO regulations are prescriptive but the Polar Code differs in that it is goal-based. Goal-based standards focus on achieving specific goals and functional requirements so if a hazard (as outlined and defined in the Polar Code) is not applicable to the vessel's operation, then the requirements related to those hazards are not applied. However, the applicability of each hazard must be proven by the owner/operator.

The general process from the start to ultimately issuing a Polar Ship Certificate can be condensed into four main steps:

1. **Data Collection –** The owner/operator should first determine the ports and routes the vessel will call and sail, including the times of year. The environmental data for each hazard outlined in the Polar Code of the ports and routes needs to be collected. The data must be sufficient to show that it is statistically significant.



2. Operational Assessment – After collecting and analysing the data, the owner/operator and key stakeholders must conduct an Operational Assessment (OA). The OA is generally structured like a formal risk assessment, assessing the risk of each hazard within the Polar Code. For those hazards that have a risk higher than the owner's/operator's tolerance, risk control measures must be proposed to reduce the risk to an acceptable level. The OA and proposed risk mitigation measures must be ship specific. The mitigation measures can be achieved by meeting the (applicable) prescriptive regulations within the Polar Code.

3. After completing the OA and the risk assessments, the OA is formally documented in a report. After determining the risk mitigation measures, the owner/operator must create the Polar Water Operational Manual (PWOM). The PWOM provides the crew and company with guidance for operations within polar waters. The PWOM should advise the crew how to safely operate their specific vessel in polar waters, how to stay within the operational limitations of the vessel and offer additional information in the event that operational conditions go beyond what is expected. As with the OA, the PWOM must be ship specific.

4. The OA report and PWOM are typically submitted to the class society that reviews it on behalf of the flag administration so that the hazards listed in the Polar Code are well considered and that all applicable Polar Code requirements are met. Upon confirmation the OA and PWOM meet the requirements, a surveyor will verify the PWOM is available onboard and that it accurately reflects the vessel's polar equipment. Upon satisfactory completion of the survey, the Polar Ship Certificate (PSC) is issued by the surveyor.

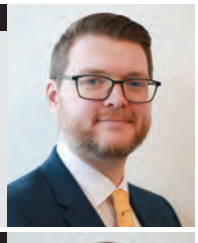
Marine traffic to polar waters such as the North West Passage and Northern Sea Route has been increasing as they become more accessible due to the increase in sea temperatures. It is critical to understand the hazards of an operation in polar waters, to help ensure the safety and security of the vessel, its crew, and the environment.

ABS has the experience and tools to help shipowners plan and execute polar voyages. ABS has helped its clients from start to finish through the Polar Code, ranging from non-ice classed bulk carriers going to Red Dog, Alaska (see the ABS Alaskan Advisory here) to heavy icebreakers performing resupply missions in the high Canadian Arctic and McMurdo station, Antarctica. Reach out to ***Polar@eagle.org*** for any ice class or Polar Code needs.

The Author

Moakler

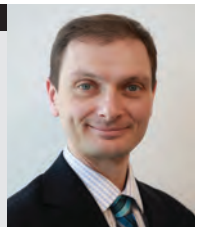
Ed Moakler is Senior Engineer at ABS Harsh Environment Technology Center. He graduated from Memorial University Newfoundland and Labrador with a Bachelor's and Master's degrees in Ocean and Naval Architectural Engineering.



The Author

Oldford

Dan Oldford is Technology Manager in the ABS Harsh Environment Technology Center. He holds a Bachelor's degree in Ocean and Naval Architectural Engineering, as well as an engineering Master's degree in Ice Mechanics.



U.S. Coast Guard photo by Petty Officer 1st Class Josh Andresky

Can an Arctic Shipbuilding Alliance Break the Ice on Long-Term Strategic Collaboration?

Without a way for industry to work together, the US, Canada, and Finland will not achieve the aims of the ICE pact, writes ***Denis Morais****, CEO SSI*

The United States and Canada have made no secret of their desire to add to their ice-breaking capacity, with ambitious plans to build the new tonnage in their home countries.

The US has indicated it could need as many as 40 new ice-breaking vessels, in addition to ice-class tonnage that could be required to support operations in the high north. In Canada's case, the need is for fleet replacement and additions, of potentially more than 20 new ice-capable vessels.

For both countries the need is commercial and strategic. The gradual opening up of the Northwest Passage will increase merchant shipping traffic in coming decades, though navigation will require icebreaking assistance for the foreseeable future.

In strategic terms, even without an increase in already fragile geopolitical relationships, all Arctic nations recognise the importance of the polar region to defence and economic development.

The US and Canada are home to shipyard capacities that can help meet new vessel demand, but they must look elsewhere for technical expertise to supply it, principally Finland.

The existing Icebreaker Collaboration Effort agreement between these three countries signals a willingness to co-operate on icebreaking but amounts in practice to a memorandum of understanding rather than a commitment to design and build the required ships.

The key challenge for the US and Canada is to gain the knowledge needed for icebreaker construction to deliver the required volume of vessels and to build a sustainable industry.

Beyond meeting immediate demands, their ultimate goal is to sustain robust shipbuilding industries. Finland, a leader in icebreaking technology and supply chain expertise, constructs over 50% of the world's icebreaking vessels. Its knowledge and expertise present an invaluable opportunity for synergy between these countries – and potentially others.

Although different in many respects, an Arctic shipbuilding alliance could resemble the AUKUS partnership which strengthens security co-operation and capacity while sharing knowledge between members and putting capacity where it is most needed. The AUKUS partnership model – which has explicit pillars and committed industry participants - would encourage ICE Pact nations to commit to hitting agreed milestones.

The question is how to leverage the expertise in Finland to enable the US and Canada to develop capacity and capability, providing long term support to their shipbuilding industries.

Attempting to build all the required vessels independently, without sharing knowledge or resources, risks falling short of national objectives. No nation wants to entirely outsource the

construction of vessels or simply purchase finished ships. Each country aspires to build a self-sufficient shipbuilding industry.

Several challenges present themselves. It might seem optimistic or even naïve to call for international co-operation at a time when trade tensions and geopolitics are so close to front of mind for businesses, governments and consumers.

However, since the world will continue to change rapidly over the next decade and beyond, it seems reasonable to consider how to create the industry alliances that can support mutual interest and encourage investment.

Building the necessary supply chain could face obstacles if trade barriers continue to rise and fall, though in the longer term this should encourage investment made against commitments to build the new vessels.

The US and Canada also need to bring together government and commercial stakeholders – including designers, shipbuilders and the material and equipment supply chain - into a single cohesive team as Finland has done so successfully.

An Arctic Shipbuilding Alliance, centred on connecting designers and shipyards, could foster the collaboration required to achieve shared goals. This partnership could enable the efficient production of icebreaking vessels while simultaneously fostering the development of shipbuilding capabilities across skilled labour, supply chains and technology.

To address the immediate need for vessels, the initial phases of this collaboration may involve outsourcing design, construction, and supply chain activities beyond national borders. Over time, however, such collaboration would help each country develop the capabilities needed to meet future demands autonomously.

This approach also goes further than short- or long-term political goals. It promotes mutual growth, ensuring that each nation benefits equitably while avoiding monopolization of advantages. Ultimately, by working together strategically, these countries will build industries that are resilient, innovative and sustainable.

The Author

Morais

Denis Morais is the CEO of SSI. He has been internationally recognized for his work in solving shipbuilding's most difficult business and technology challenges.

Wooster Products' Stair Treads Support Slip-Resistant Safety at Great Lakes Towing

Great Lakes Towing Company is the largest U.S. flag commercial tugboat operator on the Great Lakes, with more than 40 tugs stationed in 14 ports between Duluth, Minnesota, and Buffalo, New York. They've provided marine services for over 125 years, including ship assist, harbor towing, icebreaking, cargo transportation, and emergency response. As a major link in the Great Lakes - Saint Lawrence Seaway marine transportation network, the company ensures that commercial vessels can navigate safely through narrow rivers, industrial docks, and the unpredictable waters of the Great Lakes. To ensure their boats are up to the challenge, they build their own vessels at their Cleveland shipyard. Designed for longevity and efficiency, each new tugboat incorporates materials and components to withstand the rigors of maritime operations, including extreme weather swings from blistering summer heat to subzero winter conditions. Providing slip-resistant safety from the pilothouse to the engine room is imperative, which is why they use Wooster Products' stair treads in every build.

Great Lakes Towing's fleet navigates challenging routes and narrow shipping lanes. Many of the massive lake freighters they help lack bow thrusters, which makes external assistance necessary. Their tugs are responsible for maneuvering vessels through confined spaces such as the Cleveland Flats and Detroit River. Additionally, they support operations at salt plants, steel mills, and cargo docks, handling loads of iron ore, aggregates, and industrial materials. Built to last, these tugs are a testament to the durability and value of the company's fleet: *Tug America* was built in 1897 and is still in operation today at the Port of Monroe.

Slip Hazards Pose Significant Risk in Marine Environments

Tugboats operate in high-stakes conditions with grueling workloads. Unlike larger vessels, which offer more expansive stairwells and deck space, tugboats have tight corridors and steep stairways connecting essential areas like the pilothouse, crew quarters, and engine room. The risk of slips and falls is high, especially in adverse weather or during towing operations. The stairs from the pilothouse to the engine room see some of the heaviest traffic on board, making these stairs a particular concern. Engine spaces frequently accumulate minor oil leaks, airborne mist from lubrication systems, tracked-in grease, and condensation, all of which create slip hazards when tracked onto the stairs. These boats require a tough, non-slip solution to help prevent accidents and ensure crew safety while tolerating the extreme conditions of daily operation.

Thankfully, stair treads with abrasive material throughout them provide traction in stairways where secure footing is critical. Scott Crompton, Purchasing Manager for Great Lakes Shipyard, confirms that Wooster Products has been their trusted choice for years. "We've been using Wooster's stair treads since before I came here," he says. Each tug requires 14 treads to ensure a secure grip on every step, and they're installed during the finish work stage of the build. Just like the tugs themselves, the Wooster stair treads are built to go the distance.

All images courtesy of Wooster Products

"We haven't had to replace any treads during my time here," Crompton adds. "They hold up well, just the usual wear and tear you'd expect."

Great Lakes Towing uses Wooster's Stairmaster® Type 182 safety treads, which are ideal for extreme maritime conditions. Constructed with a heat-treated, corrosion-resistant aluminum base and filled with an abrasive that has a high aluminum oxide content, the treads provide superior traction, ensuring crew members always maintain sure footing. The noncombustible material meets rigorous federal guidelines, making it well-suited for demanding environments. The product comes in customizable lengths up to 12 feet in a range of colors. Great Lakes purchases black treads, eight inches deep by 27" wide, with holes drilled and countersunk, and finished with square side ends. The surface provides enhanced traction while the durable construction endures constant use, vibration, and exposure to the elements.

An Industry Dependent on Efficiency

The marine construction and repair industries are vulnerable to downtime. Every day a vessel is out of service means lost revenue and operational setbacks. Seasonal weather constraints add to the urgency, particularly in the Great Lakes, where missing a narrow operational window could mean losing an entire season of work. Supply interruptions for repairs or installations also means waiting on approvals before returning to service. Skilled workers are expensive, and delayed or difficult to use parts can add to labor costs and increase overhead.

Great Lakes Shipyard is a full-service shop, providing expert service for customer vessels, including new vessel and barge construction, fabrication, maintenance, and repairs. They also build and maintain their own fleet at the shipyard. From start to sea trial, the average tug spends one year in the shop. "We just finished the *New York*," Crompton added, "and the one we have in now will be getting some Wooster treads in September." In an industry where time is money, every component needs to be reliable, easy to install, and built to last. The pre-drilled countersunk holes on Wooster's stair treads makes installation quick and efficient. Sourcing reliable parts is also key to keeping operations running smoothly, and the facility appreciates Wooster's straightforward ordering process. "Once a part is working well, we tend to stick with it," Crompton says, "and ordering is simple. I send a past quote, and they get back very quickly. Delivery is within two to three weeks," he adds.

Marine Safety and Environmental Commitments

Great Lakes Towing is committed to reducing greenhouse gas emissions through fuel-efficient tugboat designs, upgrading propulsion systems to meet modern environmental standards, and incorporating sustainability initiatives into shipyard operations. Durable, long-lasting stair treads help the company reduce material waste and avoid frequent replacements, which contributes to more sustainable resource use. Dependable components also support efficient shipyard operations by minimizing downtime for maintenance and repairs. Investing in high-quality, wear-resistant components ensures that every new tugboat is built to last, reducing overall environmental impact.

Great Lakes Towing trusts Wooster Products to provide proven, slip-resistant stair treads for their new tugboat builds. With a longstanding reputation for quality and safety, Wooster helps to protect crews, extend the lifespan of vessels, and maintain the highest standards in the industry. "We know we can rely on them," says Crompton. "It's a small but critical part of our tugboats." As the company continues to expand its fleet, Wooster's non-slip solutions remain an essential part of every vessel's design.

Hanwha Ocean *reaches world-first milestone with 200th LNG carrier delivery earlier this year.*

Image courtesy Hanwha Ocean

ASIAN NATIONS BATTLE FOR SHIPBUILDING SHARE

China is the leading shipbuilder, but its competitors are working hard to remain in the race.

By Wendy Laursen

China's share of the tanker orderbook rose from 32.4% in 2022, to 62.6% in 2023 and then 71.2% in 2024. Its share of the container ship orderbook has shown a similar growth trajectory. The nation has ranked first in the world for new orders since 2012. Labor costs are about half of what they are in Korea and Japan, and China is the world's cheapest steel manufacturer.

Niels Rasmussen, Chief Shipping Analyst at BIMCO, says that during the past five years Chinese shipyards have built 50% of the ship capacity delivered, and Chinese shipyards now hold 66% of the ship capacity in the orderbook. "It is particularly noteworthy that Chinese shipyards have begun to attract more and more 'advanced' ship types that South Korean shipyards previously dominated, e.g. LNG tankers and the very largest container ships."

Last year, for example, Jiangnan Shipyard and China Shipbuilding Industry Corporation jointly delivered the Chinese designed 175,000 cubic meter Mark III Flex membrane LNG carrier Al Shelila to ADNOC.

Container ships and LNG tankers make up around 45% of the capacity on order for delivery during the coming five years but only around 25% of the capacity delivered during the past five years, Rasmussen says. Focus has firmly shifted to the largest container ships. The container ships delivered during the next five years will on average be 80-85% larger than those delivered during the past five years.

Chinese yards are looking to maintain their lead in the growing new fuel and clean technology market, and engine and equipment designers are building local capacity. Silverstream

COMING TO AMERICA: *In June,* **HD Hyundai** *announced the launch of a strategic shipbuilding collaboration centered on* **Tampa Ship**, *an Edison Chouest Offshore (ECO) company to build container ships in the U.S.* **Dino Chouest**, *Executive Vice President of ECO and* **Choi Hannae**, *Vice President, Head of Corporate Planning Division at HD Korea Shipbuilding & Offshore Engineering.*

Image courtesy ECO

Technologies, for example, is a founding member of the Global Sustainable Transport Innovation Alliance (GSTIA), an initiative sponsored by the Chinese Ministry of Transport, designed to accelerate green industrial projects within China.

Andrew Starforth, Silverstream General Manager, China, says that at the start of January 2025, the number of ships (over 5,000dwt) built in Asia with energy efficiency technologies onboard or on order totaled over 10,000 vessels – an increase of roughly 10% from January 2024. Silverstream works with 20 shipyard partners worldwide, including 16 across China, Korea and Singapore, and Starforth says that, based on data from Clarksons, approximately a third of in-service tonnage built at Asian shipyards is now equipped with some type of emissions-reducing technology. Silverstream's calculations show that 42% of the entire Asian orderbook has energy efficiency technologies on order or already installed.

Korea's market share in the global shipbuilding market has been declining over the past four years, and the government has announced a 10-year investment plan to help businesses develop smart and clean energy technologies for the shipbuilding industry. The "K-Shipbuilding Hyper-Gap Vision 2040" aims to advance the nation's capabilities in engines powered by LNG, ammonia and hydrogen.

Korea is also taking up the efficiency challenge in one of its key strengths – LNG carriers. Korean Register has signed a MoU with Samsung Heavy Industries to jointly develop a 174,000cbm

LNG carrier featuring three cargo tanks. Reducing the number of tanks is expected to lighten the hull, thereby improving fuel efficiency and decreasing natural boil-off of LNG, ultimately reducing operating costs. Fewer tanks also mean fewer onboard pumping systems, which simplifies maintenance and reduces long-term operational expenses.

Another MoU was signed with Hanwha Ocean for the development of an LNG carrier featuring a forward deckhouse. The optimized hull form is expected to reduce wind resistance and improve fuel efficiency, while providing more space for incorporating energy saving devices such as wind-assisted propulsion systems.

Move positive developments are on the way. Chinese shipbuilders have been dominating the feeder container ship market, but HD Hyundai Mipo is gradually expanding its market share based on its differentiated technology and high quality. The yard won orders for 16 feeder container ships (under 3,000 TEU) out of a total of 33 ships ordered worldwide this year (according to Clarksons), taking first place in market share.

Korea is also looking to the U.S. market. Hanwha Ocean has already acquired Philly Shipyard, and is looking to acquire Austal. HD Hyundai has entered a technology partnership with Huntington Ingalls and signed a collaboration deal with Edison Chouest Offshore.

Japan is also pursuing deeper collaboration with the U.S. through a Japan-US Shipbuilding Revitalization Fund. The idea is to focus on car carriers, LNG carriers and ice class naval vessels.

The volume of construction and orders received by the Japanese shipbuilding industry has dropped significantly due to the rise of China and South Korea. In addition, the technical capabilities that are the strength of the Japanese shipbuilding industry are being rapidly pursued by the two countries. Despite this, Japan aims to double its shipbuilding output by 2030, and the Nikkei recently reported that the Japanese government is considering establishing national shipyards operated by private companies.

Japan has around a quarter of the bulk carrier orderbook, China now has the rest and is gaining market share, according to global shipbrokers BRS Group. Japanese yards are consolidating to enhance their competitiveness: Tsuneishi Shipbuilding has acquired Mitsui E&S, and Imabari Shipbuilding and Japan Marine United (JMU) are further consolidating their business. Kawasaki Heavy Industries, Imabari Shipbuilding and Japan Marine United are jointly planning to build liquefied hydrogen carriers. The aim is to combine facilities and human resources following the first commercial carrier to be designed and built by Kawasaki Heavy Industries.

Some Asian shipbuilders have acquired yards in Vietnam and the Philippines to boost production and lower costs. Vietnam's orderbook was exceeded by the Philippines in 2024, led by Tsuneishi Heavy Industries Cebu, but Vietnam's shipbuilding has increased tenfold over the past 10 years and is expected to keep growing.

Still, as BRS says in its Annual Review 2025: "China has built a remarkable shipbuilding industry with well-equipped shipyards, a large base of marine equipment makers, and a robust banking system with personnel well acquainted and dedicated to the task. The nation's success in shipbuilding is no longer just about cheap labor. China has also developed a strong shipowning sector, naturally capable of placing a huge number of orders with domestic yards – an advantage that Japan also knows but South Korea lacks."

China's fortunes could still change. BIMCO's figures for the first half of 2025 indicate that Chinese shipyards' market share has dropped from 72% to 52% amid growing concerns over the impact of US Trade Representative (USTR) port fees on Chinese ships.

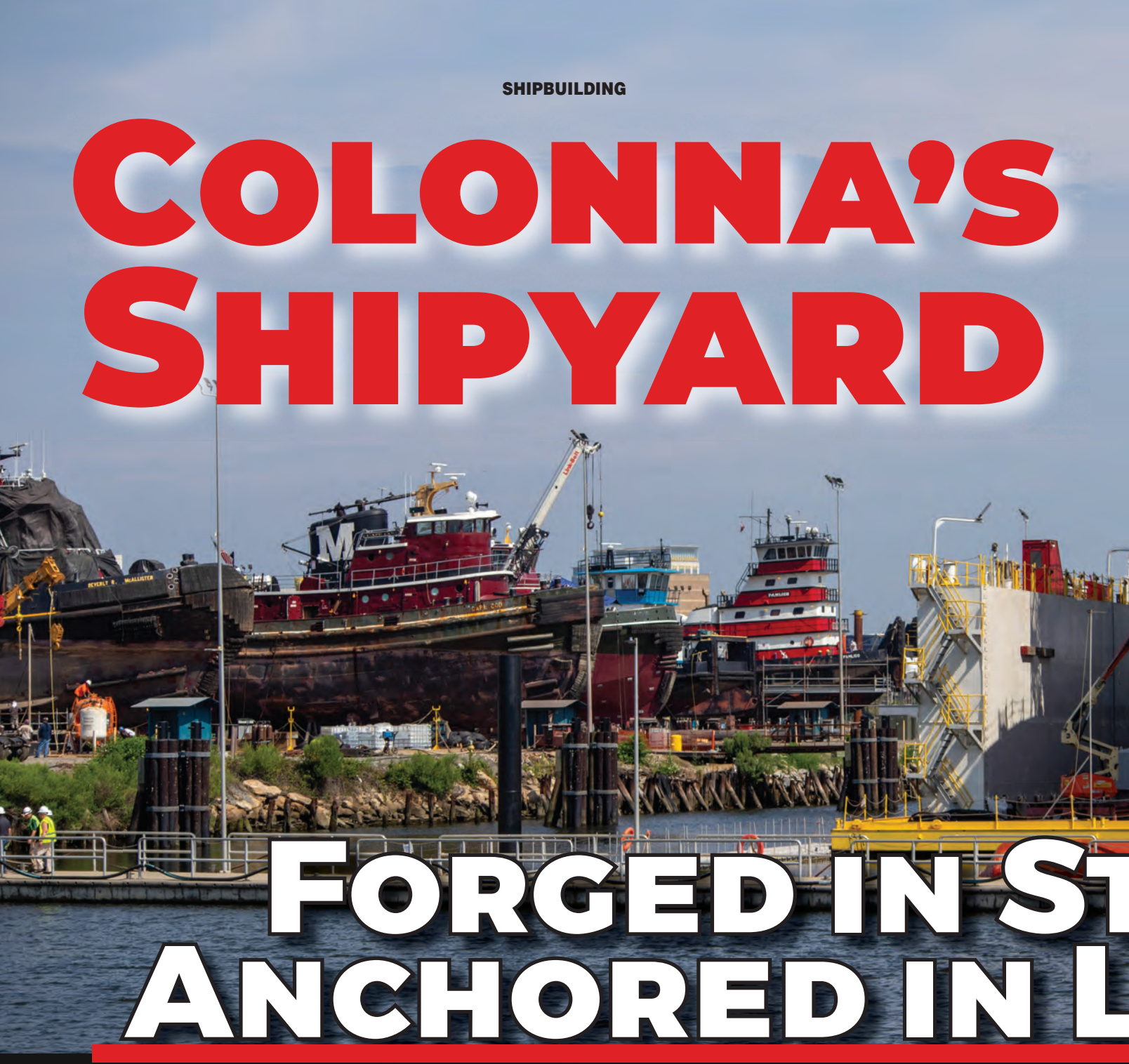
Image courtesy Tsuneishi Shipbuilding

JAPAN:
In May, **Tsuneishi Shipbuilding** *delivered the world's first methanol dual-fuel Ultramax bulk carrier.*

VIETNAM:
Naming ceremony for a bulk carrier at **HD Hyundai Vietnam Shipbuilding**.

Image courtesy HD Hyundai Vietnam Shipbuilding

Colonna's Shipyard



Forged in St
Anchored in L

*Colonna's Shipyard is a fifth-generation, family-owned medium-sized shipbuilder, led by **Randall Crutchfield**, Chairman & CEO, today. Founded in 1875 by 26-year-old ship carpenter **Charles J. Colonna** with a $2,000 loan from his brother, he founded a company that has not only withstood the test of time, but **today stands ready as a multi-faceted 'blue collar industrial complex'** to help in the effort to effectively rebuild the U.S. shipbuilding base, and more specifically to help rebuild the U.S. Navy and U.S. government-owned fleet of ships.*

All images courtesy Colonna's Shipyard

TEEL, LEGACY

By Greg Trauthwein

In an industry where tradition meets transformation, Colonna's Shipyard stands out. This year, the company celebrates its milestone anniversary, 15 decades of highs and lows, earmarked with the multitude of people and signature projects that have helped to define this journey, the shipyard and it's growing stable of blue-collar sister companies a testament to perseverance.

To put it in perspective, Colonna's Shipyard was in business before the invention of the phonograph, the Incandescent lightbulb, the automobile & the airplane … Colonna's Shipyard was formed just 10 years following the U.S. Civil war; Ulysses S. Grant was president, and since then there have been 27 additional U.S. presidents.

It's timely tale, too, as shipbuilding and a resurgence of U.S. industrial might in the maritime sector is at the forefront of political agenda.

At the helm today is Randall Crutchfield, a fifth-generation descendant of founder Charles Colonna. Crutchfield, now chairman and CEO. His personal journey through nearly every layer of the organization mirrors the evolution of the company itself—from humble, horse-powered beginnings to a modern, multi-division enterprise serving both commercial and government customers with precision and scale.

Crutchfield's Journey: From the Docks to the Boardroom

For Crutchfield, Colonna's has never been just a business: it is family. As the son of a Colonna (his mother), he grew up amid the dust, grit and iron of the shipyard. "While other kids were on spring break, I was out here on the waterfront," he said.

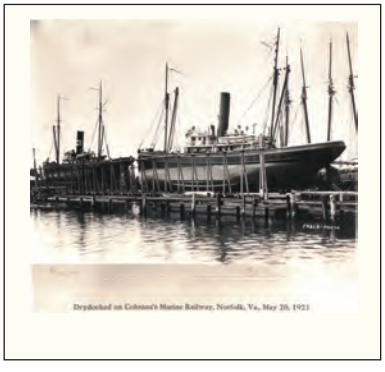
While Crutchfield admits that at the time "I didn't have very much appreciation for doing that," he admits that those summers spent building ship blocks and learning trades from multi-generational workers would later serve as the foundation for a leadership philosophy rooted in respect for hands-on work and institutional memory. "A lot of those

Colonna's Shipyard, established by Charles J. Colonna. His original policy was "hard work, good value, and fair dealing."

1875

Railway #3 Installed. Still in service today, it continues to serve the regional commercial maritime market including barges and fishing vessels.

1890



Maritime Matters: The Marinelink Podcast
From building wooden ships to building sections for the U.S. Navy's Columbia Class submarines, Colonna's Shipyard's breadth and diversity is its strength. **Scan the QR** *code to listen to the full Maritime Matters: The Marinelink Podcast featuring* **Randall Crutchfield, Chairman & CEO, Colonna's Shipyard,** *the fifth-generation, family leader of this medium-sized shipbuilder.*

"Watching our people polish every weld, track every joint, compile the mountain of paperwork, and ship the component to the nuclear builder: just incredible. It's the kind of work that energizes a team."

– Randall Crutchfield, Chairman & CEO, Colonna's Shipyard, in discussing the shipyard's role in the Columbia-class submarine program.

THE ABILITY TO EFFICIENTLY LIFT, MOVE AND WORK ON VESSELS IS CENTRAL TO ANY SHIP YARD'S SUCCESS.


Drydocked on Colonna's Marine Railway, Norfolk, Va., May 20, 1921

Horse-drawn marine railways were retired; power was obtained from steam engines and later graduated to electric motorized chains and gears.

Early 1900s

Norfolk Lighterage Company began trading as is known today – Norfolk Barge Company.

1917

The Inside Machine Shop, still in operation today, was built. When completed, it was considered one of the largest and best on the east coast.

1920

Installation of #4 Marine Railway. Retired in 2014 – it was the largest marine railway on the east coast at that time.

1920

guys that I was working with side-by-side still work here today."

After earning his degree, Crutchfield returned to the yard with a long-term commitment to his family's legacy. His first major assignment was spearheading a land development project that would redefine the yard's capabilities. The centerpiece? A then-record-setting 1,000-metric-ton Marine Travelift, transforming underutilized acreage into a bustling 12-slot service center for tugboats, fishing vessels, Coast Guard cutters, and Navy support craft.

"The lift changed everything," Crutchfield explained. "Instead of hauling out one or two vessels at a time, we could now work on a dozen—simultaneously." It was a bold move that signaled Colonna's appetite for reinvestment and scale.

From Railways to Dry Docks: "A two horsepower business"

Colonna's origins date back to 1875, when Charles Colonna secured a $2,000 loan—twice—from his brother.

"We started out with a horse-drawn marine railway," said Crutchfield. "Think about that, think about where we are today. Think about a horse walking in a circle around a king post hauling a ship out of the water. If the ship was heavy, two horses were needed, so we make the joke that we were two horsepower business when we first started out. I'm just trying to contextualize the beginnings of the place."

That original railway – built in 1890 – remarkably is still in operation 135 years later, and booked nearly 300 days a year, a living monument to durability and tradition.

When asked to discuss the shipyard's pivotal moments over 15 decades, Crutchfield was eager to share a select few of the shipyard's failures, instead. "I think that those low points, and our willingness to get through them, is what ends up being the highlight reel.

One was a large capital outlay during World War One to install another marine railway at the request of the DoD to help the war effort. But by the time the railway was built, the war was over and the

1954 — Benjamin Okeson Colonna becomes the third president of Colonna's Shipyard, carrying on an already proud legacy.

1977 — Willoughby Warren "Bill" Colonna, Jr. becomes principal owner of Colonna's Shipyard as its fifth president and CEO. Under his management, the number of employees would quadruple, and the annual income would increase sevenfold, due to an increased amount of government work.

WHEN IT COMES TO SHIPYARD WORKFORCE, 'THE NEXT GENERATION' IS A PERPETUAL CHALLENGE. ACCORDING TO CRUTCHFIELD, ANOTHER CHALLENGE IS EFFECTIVELY MANAGING THE RECRUITMENT AND WORKFORCE THAT VARIES WIDELY IN AGE.

COLONNA'S SHIPYARD *"BY THE NUMBERS"*

PIERS	11
ACRES	120
WATER DEPTH	30 FT.
DRYDOCKS	3 [14,000, 12,000 & 2,400 TONS]
TRAVELIFT	ONE 1,000-TON
MARINE RAILWAY	1 [BUILT IN 1890]
WORKFORCE	400-500

COLONNA'S SHIPYARD DIVISIONS & AFFILIATES

- COLONNA DOWN RIVER DIVISION
- ACCURITY INDUSTRIAL CONTRACTORS
- NORFOLK BARGE COMPANY
- STEEL AMERICA
- WELD AMERICA
- COLONNA'S SHIPYARD WEST

"The Captain Will," Colonna's Shipyard's first Floating Drydock installed.

1987

Founding of Steel America, a division of Colonna's Shipyard, Inc. Specializing in heavy machining, fabrication and repair, Steel America supports ship repair, maintenance and overhaul markets.

2000

Bill III – Colonna's second Drydock is installed.

Early 2000's

Colonna's executed a $20 million yard expansion and purchase of the Travelift with an impressive lifting capacity of 1,000 metric tons.

2009

"We've always done machining; if you're hauling work boats, tug boats, fish boats, etc., they need shaft work, they need bearing work, they need rudder work; it's all part of being a full-service ship repair facility. **We doubled down on it and asked: 'What about the ships that don't come to Colonna's, ships which might need some help machining?** *So we started developing all of the processes to be a full service, shafting, rudder repair for larger ships. Where that landed us was into an order and agreement with the US Navy and the Coast Guard to do surface fleet propulsion shaft manufacturing and repair."*

– Randall Crutchfield, Chairman & CEO, Colonna's Shipyard

business nearly went bust. "We got really tight, but I'll tell you that that marine railway stayed in operation for close to 100 years. If you can look at it from a long-term perspective, you can just dig through the hard times, do the right thing, and believe it's going to pay off eventually."

Another rough patch during his grandfather's tenure was when the shipyard purchased a 14,000-ton drydock from the Dutch government to help execute a multi-hull, large ship conversion contract from the U.S. Coast Guard. "Midway through that contract was terminated, and we ended up in a really poor cash flow position. We were overextended and we had to file Chapter 11, eventually reorganizing."

Each challenge, he says, became a crucible from which the company emerged stronger, more resilient, and more committed to its mission.

"My grandfather once got a meeting with the Secretary of the Navy during a time of severe financial strain," Crutchfield recounted. "Turns out, the secretary's grandmother lived a block from our gate. Whether that swayed the decision or not, we got a settlement that helped us survive. Those are the moments that define a company."

Facilities and Technology

Today, Colonna's spans 120 acres of prime waterfront in Norfolk, boasting 11 piers, three floating dry docks (up to 14,000 tons), and that still-active 1890 marine railway. But it's the technological diversification that distinguishes Colonna's from many peers.

Beyond traditional ship repair, the company has grown into a vertically integrated industrial ecosystem through its sub-brands. Steel America, for example, specializes in large modular fabrication and heavy machining, producing components weighing up to 1,000 metric tons. Steel America's capability to manufacture and barge out massive bridge sections, hydro gates, and submarine

Colonna's Shipyard West was founded, expanding the enterprise to San Diego, CA.

2015

modules has opened new revenue streams and strategic partnerships with defense primes and energy customers.

Its machine shop, bolstered by Navy and Coast Guard contracts, handles shaft and rudder work, both in-shop and through in-place machining. Weld America, launched in 2020, offers turnkey specialty welding solutions. And in 2023, Colonna's acquired Acurity Industrial Contractors in Owensboro, Kentucky, expanding into power generation, process piping, and distillery infrastructure. "It's still blue-collar project work, just in another sector," said Crutchfield.

In San Diego, Colonna's West mirrors the Downriver business unit in Norfolk, providing mobile ship repair services at Navy bases and commercial yards. This national footprint positions the company for maximum flexibility while supporting Navy readiness and fleet sustainment.

Projects

Two projects stand out in Crutchfield's tenure as signature moments. First, a full-year overhaul of a Navy Landing Ship Dock (LSD) alongside a local partner. The project tested Colonna's ability to perform high-complexity work traditionally reserved for larger, prime contractors. "We surprised some folks," Crutchfield admitted. "And we proved to ourselves that we could compete and deliver."

The second was Colonna's role in the Columbia-class submarine program—building high-spec, technically rigorous structures at the front end of the Navy's most sensitive projects. "Watching our people polish every weld, track every joint, compile the mountain of paperwork, and ship the component to the nuclear builder: just incredible," said Crutchfield. "It's the kind of work that energizes a team."

Looking Ahead: Government Work Rises, Workforce Evolves

While Colonna's historically split its business 60/40 in favor of commercial work, the pendulum has swung. Today, the mix is roughly 60% government, 40% commercial, a shift driven by expanded fabrication work for the Navy and growth in surface fleet maintenance. The shop floor today hums with components for aircraft carriers, submarine modules, Army and Coast Guard vessels, and NOAA ships, alongside commercial tugs, barges, and fishing boats. Colonna's isn't just riding the wave of maritime reindustrialization, it's building it.

But growth presents challenges.

The company currently employs about 750 people, and Crutchfield acknowledges the complexities of managing a workforce that spans five generations. "We're hiring baby boomers through Gen Z," he said. "Each group has different priorities, and we need to address all of them—from pay and benefits to workplace culture."

Recruitment is a long game, Crutchfield noted, and it hinges on storytelling. "Let us tell you what it's like to build something that serves the country or moves a thousand tons downriver. This work has meaning."

U.S. Shipbuilding: A Call to Action

Crutchfield is clear-eyed about the broader implications of Colonna's journey. "This is the most exciting time in my career to be in the maritime industry," he said. With bipartisan support for maritime revitalization and strategic legislation like the proposed Ships for America Act, the sector is poised for a generational reset.

But he also offers a caution: "We're late to realize what other countries already knew: China, South Korea, Turkey, Japan. They invested intentionally in their shipbuilding capabilities. We're only now catching up."

Colonna's is moving ahead with or without federal incentives, investing in dry docks, machining, and fabrication capabilities. "We're ready to compete—fair and square," Crutchfield said. "But the country has to decide if shipbuilding is a priority again."

After 150 years, Colonna's is not standing still. The company that began with a $2,000 loan and a horse-powered railway now shapes the steel that powers America's future, both for commercial endeavors as well as military might. Randall Crutchfield, carrying both a legacy and a vision, is steering the company toward a new era defined by strategic relevance, multi-sector capability, and an unshakeable commitment to American maritime excellence. "The people who work here breathe this stuff," he said. "We're builders, fixers, problem-solvers. And after 150 years, we're just getting started."

2016 — "The Charles J. Colonna". Colonna's installed it's third Floating Drydock.

2020 — Weld America was founded, supplying 24/7 on-site welding services.

2023 — Colonna's acquired Accurity Industrial Contractors, located in Owensboro, KY.

2025 — Colonna's Shipyard, Inc. celebrates it's 150 Year Anniversary.

Identifying & Mitigating Risk on the Waterfront

AON STRENGTHENS ITS PRESENCE IN THE VIRGINIA MARITIME HUB

Colonna's Shipyard sits in Norfolk, VA, arguably one of the biggest and strongest maritime hubs in the U.S. Earlier this year Aon expanded its U.S. footprint with the opening of a new office in Richmond, Virginia, reinforcing its commitment to serving the insurance and risk management needs of one of America's most dynamic maritime regions.

Aon has long operated in the corridor from Fredericksburg through Richmond to Tidewater, but service delivery was historically coordinated from various offices outside Virginia. The new Richmond location centralizes these efforts and creates what the company describes as "a fully accountable, on-the-ground team" said **George Andersen, US Marine Chief Broking Officer** to serve maritime and middle-market clients across the state. "Our new office in Richmond allows the opportunity to raise the local awareness of Aon and to coalesce our service delivery and sales efforts through teammates who are present in the market."

The move also reflects Aon's integration of NFP and Wealthspire, two middle-market risk and benefits brokers acquired in 2024. "The Virginia and Tidewater markets are brimming with businesses in this segment, and our new local presence will clearly enhance our ability to establish relationships and work more effectively with these businesses," said **Tayloe Negus, Richmond / Southern Virginia Office Leader**.

Building a Full-Service Team in a Maritime Hub

Aon's Richmond/Southern Virginia office opens with more than 20 colleagues representing commercial risk, health, wealth, and human capital solutions, growing to 40 employees when including NFP and Wealthspire teams. Notably, **Denise Perlman, Aon's newly appointed North American CEO for the middle-market segment**, will also be based in Richmond.

"We are full service out of the gate," said Negus. "And while we have incredible resources readily available in the market, we always strive to ensure our clients are getting the very best expertise — whether that's marine, risk engineering, or specialized solutions — available anywhere at Aon."

Addressing Emerging Maritime Risks

AON sees broad opportunity across all maritime sectors it serves, including tug and barge operators, traditional shipping companies, shipyards, and marine terminals. But the rapidly evolving regulatory and geopolitical landscape brings new challenges.

"Current policy shifts are forcing clients to adapt quickly," said Andersen. "Tug operators may need to repurpose vessels, cargo owners are seeking new warehousing options, and unfamiliar ports with different risk profiles are being utilized."

These changes, the company noted, can elevate exposures, particularly around security, theft, and loss control, and demand proactive risk management.

One key focus is mitigating indirect and contingent exposures, from geopolitical trade disruptions to supply chain volatility. "At Aon, we're uniquely positioned to tackle this challenge through our Risk Capital structure," Andersen explained. "Unlike many of our peers who are confined by separate P&Ls, our model puts the client at the center and enables true cross-sector innovation at scale and speed."

Strengthening Ties to Virginia's Maritime Industry

Richmond and the broader Tidewater area are vital hubs for shipbuilding, terminal operations, and logistics, industries that Aon believes will see sustained growth under new federal priorities.

"This investment reflects our commitment to meeting clients where they are," Negus said. "The maritime sector is evolving rapidly, and our expanded presence ensures we can deliver the insights, expertise, and solutions clients need to navigate emerging risks and seize new opportunities."

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MOVING AHEAD
TRINIDAD AND TOBAGO MARITIME BLUE ECONOMY 2025

By Wilfred de Gannes, Chairman & CEO, Shipbuilding & Repair Development Co. of Trinidad and Tobago Limited (SRDC)

The La Brea Shipyard is a flagship maritime project first conceptualized shortly after the establishment of the Shipbuilding & Repair Development Company of Trinidad and Tobago Limited (SRDC) in 2008. Initially launched as a diversification initiative under the Ministry of Trade and Industry (now the Ministry of Trade, Investment & Tourism), this U.S. dollar revenue-generating project remains a key priority for the SRDC. The company anticipates closer collaboration with the newly elected Government of Trinidad and Tobago, which assumed office on April 28, 2025 and lead by The Honorable Kamla Persad-Bissessar, M.P., S.C. Substantial progress has already been made, including the submission of essential project planning approvals to local authorities. Prior to the COVID-19 pandemic, SRDC had generated strong interest from potential shipyard workers and contractors, many of whom were shortlisted for various roles.

Today, SRDC's extensive labor database of pre-approved personnel could also serve workforce needs under President Donald Trump's new U.S. initiative to revitalize the shipbuilding industry. His Executive Order of April 9, 2025, titled "Restoring America's Maritime Dominance," lays out a strategy to rejuvenate commercial and military shipbuilding. A similar model is already active in South Korea, where approximately 25% of shipyard labor is sourced from the Indian subcontinent. A comparable approach in Trinidad and Tobago could offer valuable skill-building opportunities and exposure to advanced technologies during the shipyard's construction phase.

U.S. PROJECT FINANCING OPTIONS

The SRDC team continues to explore maritime collaboration opportunities in the United States, having signed an initial post-pandemic Memorandum of Understanding with a major counterpart. In a significant development, the company has committed to opening a U.S.-incorporated shipyard sub-office in Q3 2025 to help accelerate the La Brea project's implementation. This will streamline contractual obligations under U.S. law, especially given delays in resolving corporate matters through local courts. These U.S.-based initiatives follow the SRDC's La Brea Shipyard project nomination and selection for the 2023 Caribbean Investment Forum (CIF) hosted at the Atlantis Resort in the Bahamas. The event, organized by the Caribbean Export Development Agency, attracted over 800 participants from more than 40 countries. Refer to: **https://carib-export.com/publications/investment-opportunities-**

Installation of deepwater Oil & Gas offshore platform on the East Coast of Trinidad using DLV2000 a large Derrick Lay Vessel in the fleet of U.S. Contractor McDermott.

Photo courtesy bp

in-the-caribbean-2023

Additional financing has been unlocked through the Export-Import Bank of the United States, following successful country-to-country arrangements finalized in Port of Spain. Similar to the Point Lisas Industrial Estate model of the 1970s, projects of this scale will rely on a mix of public and private sector capital.

DEVELOPMENT OF REQUIRED SKILLSETS

For more than 50 years, skilled Trinidadians have journeyed to the U.S. to work in fields such as shipbuilding, steel fabrication, and petrochemicals. Their contributions span prominent U.S. shipyards — including Newport News, Bath Iron Works, and Ingalls Shipbuilding — and major LNG and petrochemical sites in Alaska, Louisiana, and Texas. These experiences parallel the deep-rooted craftsmanship seen in Trinidad's Carnival costume construction and the creation of the world-famous steelpan. This cultural foundation, combined with technical training, makes Trinidadians highly adaptable to maritime and industrial environments globally—including emerging opportunities in Guyana and Suriname.

HISTORICAL SIGNIFICANCE OF LA BREA & ENVIRONS

Local support for the La Brea Shipyard remains strong

*SRDC Chairman & CEO **Wilfred de Gannes** standing in front the 5-berth mega cruise ship port located in St. John's, Capital City of Antigua and Barbuda on December 23, 2024.*

Image courtesy SRDC

among residents and SRDC's 160+ private-sector stakeholders. The project promises vital job creation and foreign exchange generation for communities across Siparia, La Brea, Point Fortin, and beyond. La Brea is steeped in maritime history. In 1595, English explorer Sir Walter Raleigh used the natural asphalt from Pitch Lake to caulk his ships. By 1857, the American Merimac Oil Company had drilled one of the earliest oil wells in the Western Hemisphere near this very site — solidifying La Brea's place in global energy history.

GROWTH OF MEGA CRUISE SHIP TOURISM

Phase I of the La Brea project envisions a world-class mega cruise ship terminal. These "cruisezillas" have doubled in size since 2000, with future vessels expected to reach 345,000 gross tons by 2050. Yet existing ports in Port of Spain and Scarborough lack berth restrictions and the required harbor depth to accommodate them. Norwegian Cruise Line Holdings Ltd. (NYSE: NCLH) for example has four ships over 1,200 feet on order, all expected to launch beginning in 2030, and globally there are over seventy (70) cruise brands. La Brea's naturally sheltered deep-water harbor at Point D'or offers the ideal location for cruise tourism expansion, especially during the hurricane season. The Ministry's recent restructuring into Trade, Investment & Tourism is well-positioned to support this initiative.

UNLEASHING SOCIO-ECONOMIC POTENTIAL

A final report from the European Research for Maritime Economic Clusters (ERMES) emphasizes the value of a unified, sustainable development strategy. Such an approach enables the alignment of public, private, and academic resources to maximize regional maritime potential. The report goes on to state "To unleash the socio-economic potential that port and maritime sector can offer to a region, it is imperative that relevant stakeholders (public, private, academic, etc.) commit to a shared, integrated and sustainable ambition. This will provide a vision for actions to be targeted towards allowing for the alignment of resources that stakeholders can offer to benefit the development of the region." While "maritime clusters" are less commonly referenced in North America, longstanding European examples include those in Denmark, the Netherlands, Norway, and the United Kingdom. In the Caribbean, the Virgin Islands Professional Charter Association (VIPCA) in the U.S. Virgin Islands is leading a similar movement with over 300+ members. The VI Economic Development Authority with their local partners have completed a comprehensive ship repair feasibility study in 2024. By comparison, SRDC's growing cluster stakeholders' number 160+ stakeholders and include major U.S. partners such as Sherwin-Williams (NYSE: SHW) and Caterpillar (NYSE: CAT), represented in Trinidad and Tobago by MASSY CAT.

LNG EXPORT GROWTH CREATES OPPORTUNITIES

According to the U.S. Department of Energy, American Liquefied Natural Gas (LNG) exports rose from 0.5 Bcf/d in 2016 to 11.9 Bcf/d in 2024, making the U.S. the world's leading LNG exporter. New LNG plant investments—like Plaquemines LNG, Corpus Christi Stage 3, and Golden Pass LNG are driving demand for new LNG carriers to be built. These large ships are utilized to precious cargoes to Europe and Asia.

SRDC has proactively pursued LNG repair capabilities, signing a Memorandum of Understanding with a foreign specialist in 2016 to develop expertise in cryogenic stainless-steel membrane systems. U.S.-bound LNG carriers, returning in ballast, could undergo repairs in Trinidadian waters including those serving the nearby Atlantic LNG plant at Point Fortin, South-western Trinidad.

DEEP-WATER EXPLORATION & OIL REFINERY RESTART

The 2025 deepwater bid round launched by the Ministry of Energy and Energy Industries marks the largest in national history. According to S&P Global, it aims to unlock hydrocarbon potential in Trinidad's unexplored eastern frontier. This effort will require very large seismic ships, drilling vessels, and advanced offshore support.

Parallel to this, the proposed restart of the Point-a-Pierre refinery closed since 2018 will significantly increase shipping activity. Once successfully restarted an expected rise in visits by Very Large Crude Carriers (VLCCs), Aframax tankers, and LR2 vessels, operated by major U.S.-listed companies like Frontline plc (NYSE: FRO) and DHT Holdings, Inc. (NYSE: DHT) is expected. Increased demand for fuel bunkering, ship supplies, and repair services both dockside and at anchorage will follow.

CONCLUSION

As Trinidad and Tobago charts a bold course forward, its maritime sector is primed for transformation. Through the La Brea Shipyard, expanded LNG repair capabilities, cruise tourism, and energy infrastructure investments, the country is positioned to become a regional leader in shipbuilding, logistics, and marine services. With strategic partnerships, government backing, and skilled human capital, the vision for a robust blue economy is no longer aspirational—it is actionable and within reach.

Image courtesy SRDC

RIGHT TO LEFT: *Maritime stakeholder Sham Parasram in his former capacity at Svitzer (A.P. Moller Group) and now Advisor – Marine Technical at bp with SRDC Chairman and CEO* **Wilfred de Gannes** *being congratulated by The Honorable Prime Minister* **Kamla Persad-Bissessar**, *MP, SC during her first term at the Trade and Investment Convention held in 2011.*

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GERMANY'S MARITIME SECTOR: STEADY GROWTH AMID GLOBAL HEADWINDS

Order intake, exports, and green technology demand fuel confidence for 2025.

Germany's maritime equipment and offshore supply industry is defying global uncertainty, posting steady growth in 2024 and setting an optimistic course for 2025, according to new figures released by the VDMA Marine Equipment and Systems Association.

With an average turnover increase of 5.5% in 2024, German maritime suppliers are proving resilient in the face of global supply chain volatility, geopolitical tensions, and a fiercely competitive international market. The export share of the industry remains robust at 81%, underscoring Germany's enduring reputation for high-quality marine engineering and its strong integration into global shipbuilding supply chains.

"The industry is continuing its positive development despite global challenges," said Martin Johannsmann, Managing Director of SKF Marine GmbH and Chairman of the Board of VDMA's AG Marine Equipment and Systems. "The export strength is proof of our international competitiveness and the high demand for maritime solutions."

Aftermarket Services Hold Steady

After-sales services, including maintenance, repair, and spare parts, continue to play a key role in the sector's performance, accounting for 27% of total revenues in 2024, a consistency that highlights the long-term nature of global shipping partnerships and the growing importance of lifecycle support in an era of digitalization and performance optimization.

Employment in the sector also showed modest gains, with the total workforce growing by 1.2% year-over-year to 65,000 as of mid-2025. While this is below the pace of revenue growth, it reflects ongoing productivity improvements and the introduction of more automated and digital solutions.

Solid Order Book Signals Confidence

A critical driver of the upbeat outlook is the sustained strength in new order intake. The industry posted a 4.6% average increase in incoming orders in 2024—building on two years of already elevated demand. Looking ahead, nearly 80% of VDMA

member companies anticipate stable or increasing order volume in 2025, with only a small minority expecting any decline.

"Almost two-thirds of VDMA members expect the market to develop positively in the medium term," said Dr. Volker Behrens, Managing Director of Schoenrock Hydraulik Marine Systems GmbH.

Strategic Focus: Europe, China, and Transformation

As German suppliers look to the future, several strategic themes are taking center stage:

- **European Integration:** Roughly 36% of industry revenues are generated within Europe, reinforcing the importance of stable shipbuilding partnerships and intra-European cooperation.
- **China Positioning:** VDMA's recently published China policy calls for fair competition and urges the German government to strengthen domestic and EU frameworks to support European suppliers.
- **Bureaucracy Reduction:** The Omnibus Regulation at the EU level has been welcomed as a long-overdue step toward reducing red tape and improving flexibility for internationally operating SMEs.

Green Technologies and Electrification in Focus

One of the clearest market drivers is the transformation of the shipping industry toward sustainable technologies. Maritime suppliers are rapidly expanding their offerings in energy-efficient propulsion systems, electrification, digital services, and intelligent integration.

"Even in our medium-sized company, the trend is clearly moving toward environmentally friendly technologies," said Behrens. "We are moving away from hydraulics and toward electric drives for doors on both cruise ships and naval vessels."

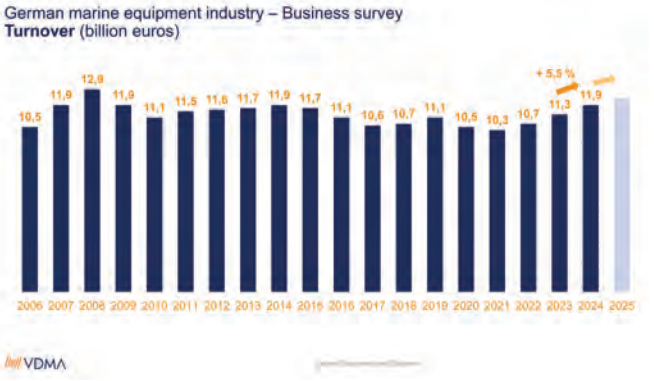
This shift aligns with broader decarbonization efforts across the maritime sector, as global regulations and customer demand increasingly favor sustainable ship design and operation.

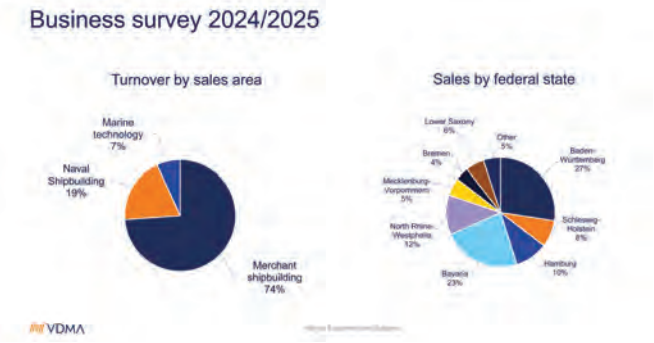
Infrastructure Investment Supports Export Logistics

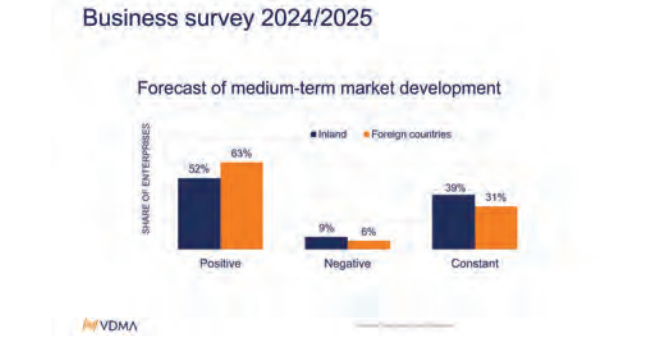
Finally, Germany's special infrastructure fund—targeting overdue upgrades in roads, rail, and waterways—is also expected to play a key enabling role. Many of the industry's export-heavy firms rely on efficient heavy-lift logistics to move components to ports and shipyards worldwide. Enhancements to this infrastructure could further enhance the sector's competitiveness.

Outlook: "Cautious Optimism"

While global shipbuilding faces headwinds, from inflation and supply chain strain to shifting geopolitical stressors, Germany's maritime suppliers appear -positioned to navigate the storm. With resilient exports, a strong order pipeline, and a deepening commitment to sustainable technology, the VDMA's member firms are setting a steady course into 2025 and beyond.







Charts courtesy VDMA

GLADDING-HEARN SHIPBUILDING:

Tradition Meets Opportunity

For Peter Duclos, shipbuilding has always been personal.

As President and Director of Business Development at Gladding-Hearn Shipbuilding, Duclos Corporation, Duclos represents the third generation of his family to lead the Somerset, Massachusetts, shipyard. "I've been involved with our family's 70-year-old company my whole life," he said. "From dinner table conversations to summer jobs, and now as President."

Armed with a mechanical engineering degree from the University of Massachusetts and a U.S. Coast Guard master's license, Duclos has played a direct role in the design, construction, and delivery of more than 180 commercial vessels during his career. His responsibilities span sales, marketing, pre-contract engineering, estimating, and strategic planning, which he shares with his brother, John Duclos (Co-President and Director of Operations), his sister Carol Hegarty (CFO), and a core team of about 80 highly skilled employees.

A YARD BUILT FOR AGILITY ...

Founded in 1955, Gladding-Hearn occupies 6.5 acres on the Taunton River, with more than 60,000 sq. ft. of covered work space. The yard maintains all trades in-house, a key strategy Duclos said, for controlling cost, schedule, and quality — and supplements with skilled contractors when needed. It also boasts a full-service engineering and naval architecture department, enhanced through partnerships with outside designers.

The yard's production pace underscores its capacity and versatility: an average of five new vessels annually, ranging from 50 to 165 feet, plus one to two major refit projects each year. Over the decades, Gladding-Hearn has delivered tugs, ferries, fireboats, police boats, pilot boats, and research vessels, building a reputation for innovation and customer focus.

(Image above) **L to R**: Peter Duclos, his sister Carol Hegarty (CFO), and brother John Duclos (Co-President and Director of Operations) carry on the family business of boatbuilding in Massachusetts.

The Chesapeake class really shows what we do best. We listen and learn from our customers and continuously improve our product. The basic design remains consistent, but each boat is tailored to meet specific pilot requirements. Over time, we've refined performance, efficiency, and arrangement."

– Peter Duclos, President and Director of Business Development, Gladding-Hearn Shipbuilding, Duclos Corporation

Gladding-Hearn at a Glance

Founded:	1955
Location:	Somerset, Massachusetts (6.5-acre facility on the Taunton River)
Workforce:	~80 full-time employees (plus contractors as needed)
Facilities:	60,000+ sq. ft. under cover, full-service engineering and naval architecture department
Production:	5 new vessels delivered annually (50–165 ft) + 1–2 major refits
Notable Product Line:	27 Chesapeake-class pilot boats delivered since 2002

... A BUSINESS MODEL BUILT ON LISTENING

If there's one project that exemplifies Gladding-Hearn's approach, Duclos points to the 53-ft. Chesapeake-class pilot boat. Developed with Ray Hunt Design in 2002, the model has been a cornerstone of the yard's portfolio, with 27 delivered to date.

"The Chesapeake class really shows what we do best," Duclos explained. "We listen and learn from our customers and continuously improve our product. The basic design remains consistent, but each boat is tailored to meet specific pilot requirements. Over time, we've refined performance, efficiency, and arrangement."

This iterative, customer-driven model has helped Gladding-Hearn stay competitive in a niche market where few builders can match its mix of flexibility and proven design.

THE TRUMP BUMP

For Duclos, the Trump Administration's prioritization of shipbuilding and maritime matters represents a rare and welcome shift in national policy. "It's really extraordinary and exciting to see," he said. "We can't recall ever seeing this much attention on the maritime industry and specifically shipbuilding."

While acknowledging that much of the Maritime Action Plan is aimed at larger yards, Duclos hopes for a "positive trickle down" to small- and medium-sized builders like Gladding-Hearn. He is particularly encouraged by ongoing support for MARAD programs such as Title XI financing, the Capital Construction Fund, and Small Shipyard Grants.

"Training will be the most important part of growing the maritime industry," Duclos said, noting that small companies often struggle to balance efficiency with sustained workforce development. "We'd like to see longer-term thinking when it comes to training grants. One- to two-year programs are helpful, but continuous training is what's needed to really grow the workforce."

INVESTING FOR THE FUTURE

Gladding-Hearn has leveraged MARAD's Small Shipyard Grant Program to enhance its capabilities. Since 2008, the yard has secured four grants, enabling investments such as a welder training facility, a 35-ton yard transporter, 80-foot-wide fabrication shop doors, and a 60-by-45-foot sheltered plate yard.

"These upgrades make us more capable, compliant, and efficient," Duclos said. "They've been instrumental in keeping our yard competitive in a challenging market."

As Gladding-Hearn enters its seventh decade, Duclos sees opportunity in aligning the yard's proven craftsmanship with a national push to revitalize the maritime sector. "It will be very interesting to see what happens in the next couple of years," he said. "For shipyards like ours, even modest policy changes can have a big impact."

BIRDON SCALES UP IN BAYOU LA BATRE

All images courtesy Birdon

In the heart of Bayou La Batre, Alabama, a town synonymous with Gulf Coast shipbuilding, Birdon is quietly reshaping its role in the U.S. maritime industrial base. Under the leadership of Tony Ardito, President of Birdon USA, the Australian-owned shipbuilder is scaling up to deliver on a multibillion-dollar commitment to the U.S. Coast Guard while positioning itself to benefit from what it sees as a pivotal moment for the domestic shipbuilding industry.

Ardito, a naval architect and marine engineer by training, brings more than 30 years of experience in designing, constructing, and maintaining commercial and government vessels. Over his career, he has overseen projects ranging from luxury yachts to complex defense platforms, including work for the U.S. Coast Guard, Department of Defense, and Army Corps of Engineers. "My experience spans the full lifecycle of vessels," Ardito said, "and I've helped establish or modernize multiple shipyards by leveraging automation and Industry 4.0 technologies."

The company's most visible project is its $1.187 billion contract to design and build 27 Waterways Commerce Cutters (WCCs), a program that will replace a fleet of aging Coast Guard tenders that maintain 28,200 inland Aids to Navigation supporting over 12,000 miles of the Marine Transportation System. That system moves 630 million tons of cargo annually and underpins an estimated $5.4 trillion in economic activity.

Birdon's contract covers 16 River Buoy Tenders (WLRs) and 11 Inland Construction Tenders (WLICs). "Construction on the first vessel is underway," Ardito said, "and our production team is geared to deliver four vessels annually for the next decade." Full-rate production is scheduled to begin in FY26, a milestone that will sustain hundreds of skilled jobs and stabilize Birdon's supply chain for years to come.

BUILDING FOR THE FUTURE IN BAYOU LA BATRE

To support the WCC program, Birdon has invested more than $27 million in capital improvements at its Bayou La Batre facility. The shipyard now boasts a 660-ton travel lift, 1,700 feet of waterfront, a semi-automated panel line, and dedicated paint, pipe, electrical, and metal shops. The yard is dredged to 16 feet, allowing it to accommodate vessels up to 250 feet in length, and has the capacity to deliver more than four cutters per year.

These investments extend beyond infrastructure. Birdon has built new training facilities and expanded workforce amenities, reflecting its commitment to workforce development in

"My experience spans the full lifecycle of vessels, and I've helped establish or modernize multiple shipyards by leveraging automation and Industry 4.0 technologies."
– Tony Ardito, President, Birdon USA

a competitive labor market. "Consistent funding is essential for workforce retention, supplier stability, and cost efficiency across the program," Ardito noted.

THE TRUMP BUMP

For Ardito, the Trump Administration's renewed emphasis on maritime matters is a tailwind for both Birdon and the wider industry. "We appreciate the Administration's renewed emphasis on strengthening the U.S. Maritime Industrial Base," he said. "The focus on revitalizing domestic shipbuilding aligns with Birdon's long-term goals." While specific operational changes are still forthcoming, Ardito sees the policy shift as a crucial step toward ensuring stable funding for major Coast Guard programs like the WCC effort.

A GLOBAL PARTNER WITH LOCAL IMPACT

Founded in 1977, Birdon has grown into a global defense and maritime contractor with operations across the United States, Australia, Europe, and Asia. In the U.S., its work spans projects for the Army, Marine Corps, Coast Guard, and Navy, as well as partnerships with MARAD and the broader Maritime Industrial Base.

The WCC program exemplifies Birdon's ability to blend engineering expertise, manufacturing capacity, and program management to meet urgent national needs. As Ardito puts it, "This program reflects the full strength of Birdon's capabilities—and our commitment to supporting the U.S. Coast Guard mission for decades to come."

HENDRY MARINE BUILDS ON A CENTURY OF SERVICE

All images courtesy Hendry Marine

For nearly a century, Hendry Marine Industries (HMI) has been a fixture of Tampa's waterfront, evolving from a local dredging company founded in 1926 into one of the most capable marine repair and conversion operations in the Southeast. Under the leadership of Richard McCreary, President of Gulf Marine Repair and its parent, HMI, the company is preparing for a new chapter, one partially shaped by the Trump Administration's prioritization of U.S. shipbuilding and maritime infrastructure.

McCreary, who holds a BSE in Naval Architecture and Marine Engineering from the University of Michigan and an MBA from the University of Chicago, brings a wealth of leadership experience from across the industry. His résumé spans top roles at Vigor Works, BAE Systems, and Marinette Marine, where he helped build the Navy's Freedom-class Littoral Combat Ships, as well as executive positions with VT Halter Marine. A past chairman of both the Shipbuilders Council of America and the National Shipbuilding Research Program, McCreary has spent his career at the forefront of American shipbuilding and repair.

A TAMPA POWERHOUSE

Today, HMI's core operations are anchored by Gulf Marine Repair (GMR), a Green Marine-certified shipyard specializing in repair, conversion, and modification of oceangoing commercial vessels, tugs, barges, dredges, and government craft. In 2023 alone, GMR serviced 320 vessels. Complementing GMR is Anchor Sandblasting and Coatings (ASC), which provides QP1-certified blasting, ultra-high-pressure washing, and coatings services across the region.

The numbers tell a story of scale and capability: 388 employees, 3,200 linear feet of bulkhead waterfront, four drydocks ranging from 2,500 to 10,500 LT, and the ability to handle vessels up to 950 feet by 120 feet with a 30-foot draft. All told, HMI operates across 32 acres, with an additional 25 acres under lease, positioning it as a key player in Florida's maritime economy.

THE TRUMP BUMP

For McCreary, the Trump Administration's Executive Order to "Restore American Maritime Dominance" represents the most comprehensive maritime policy push he's seen in his career. "It's the first time I've seen such emphasis on maritime military and commercial shipping, shipbuilding, associated trade restrictions, supply chain development, shipyard incentives, and workforce development, all from one Administration," he said.

At the heart of this effort is the proposed Shipbuilding and Harbor Infrastructure for Prosperity and Security (SHIPS) for America Act, which codifies many of the Executive Order's initiatives. McCreary views the Act, combined with the establishment of a White House Shipbuilding Office, as "a welcome policy reversal" after decades of decline fueled by restrictive financing programs, subsidy cuts, and industry consolidation.

While much of the policy framework is still being devel-

It's the first time I've seen such emphasis on maritime military and commercial shipping, shipbuilding, associated trade restrictions, supply chain development, shipyard incentives, and workforce development, all from one Administration."

– Richard McCreary, President of Gulf Marine Repair and its parent, HMI

oped, McCreary sees three major potential benefits for HMI:

- Expanded shipyard grants for capital investments, building on past programs that helped fund cranes, cutting tables, and drydock upgrades.
- Workforce development funding, critical to addressing what he estimates is a nationwide shortage of 100,000 to 250,000 skilled tradespeople in shipbuilding and repair.
- Subsidies for ship repowering and conversion, enabling U.S. yards to compete with heavily subsidized foreign shipyards for this work.

INVESTING IN THE FUTURE

Even as policy discussions take shape, HMI has been investing heavily in its own future. Since 2022, the company has spent or committed over $23 million on upgrades, including new cranes, a 330-ton crawler and two 220-ton units, along with drydock refurbishments and service-life extensions for its key assets. These upgrades ensure HMI can continue delivering high-quality service across its diverse portfolio.

"We have completely refurbished the F.M. Hendry drydock giving her another ten (10 years of service life," said McCreary. "We are starting the process of the service life extension and strengthening of the A.W. Hendry drydock this year and next year will be executing the service life extension of our largest drydock, the Scotia." One major ongoing project [at the time of the interview in May 2025] illustrates HMI's capabilities: a comprehensive service-life extension for an articulated tug-barge (ATB) unit, including ballast water treatment installation, cargo system upgrades, specialized coatings, and complete tug modernization, a project that will extend the unit's life by at least 20 years. As HMI approaches its centennial, McCreary is optimistic about what lies ahead.

"If these initiatives are fully realized," he said, "they will strengthen the Maritime Industrial Base, create opportunities for yards like ours, and reinforce the essential role we play in supporting both national security and commercial trade."

All images courtesy Austal USA

AUSTAL USA EXPANDS CAPACITY, CAPABILITY

As maritime holistically, shipbuilding specifically, comes to the forefront of U.S. politics, Austal USA is positioned to capitalize. From its 180-acre headquarters on Mobile Bay, the company is executing a major expansion of both capacity and capabilities, enabling it to support a broader portfolio of surface and subsea programs than ever before.

"It's exciting to see this level of attention placed on growing America's maritime industrial base," said Larry Ryder, VP of business development and external affairs. Ryder is a retired Marine with 21 years of service, and has spent his post-military career driving strategic shipbuilding growth, first at General Dynamics and now at Austal USA. In his time at Austal USA he led the company's transition into steel shipbuilding and autonomy; its expansion into Singapore and San Diego; and winning efforts for over $10B in contract awards including recent wins of the U.S. Coast Guard Offshore Patrol Cutter (OPC) and Navy TAGOS programs. He also developed the concept for the Expeditionary Medical Ship (EMS) which led to a $1B multi-ship award.

A MODERN SHIPBUILDING FACTORY

Founded in 1999, Austal USA has delivered 32 ships to the U.S. Navy at an average rate of two per year since 2009, an achievement Ryder credits to the company's modular manufacturing approach and its emphasis on early outfitting. "We're set up to deliver complex ships efficiently," Ryder said.

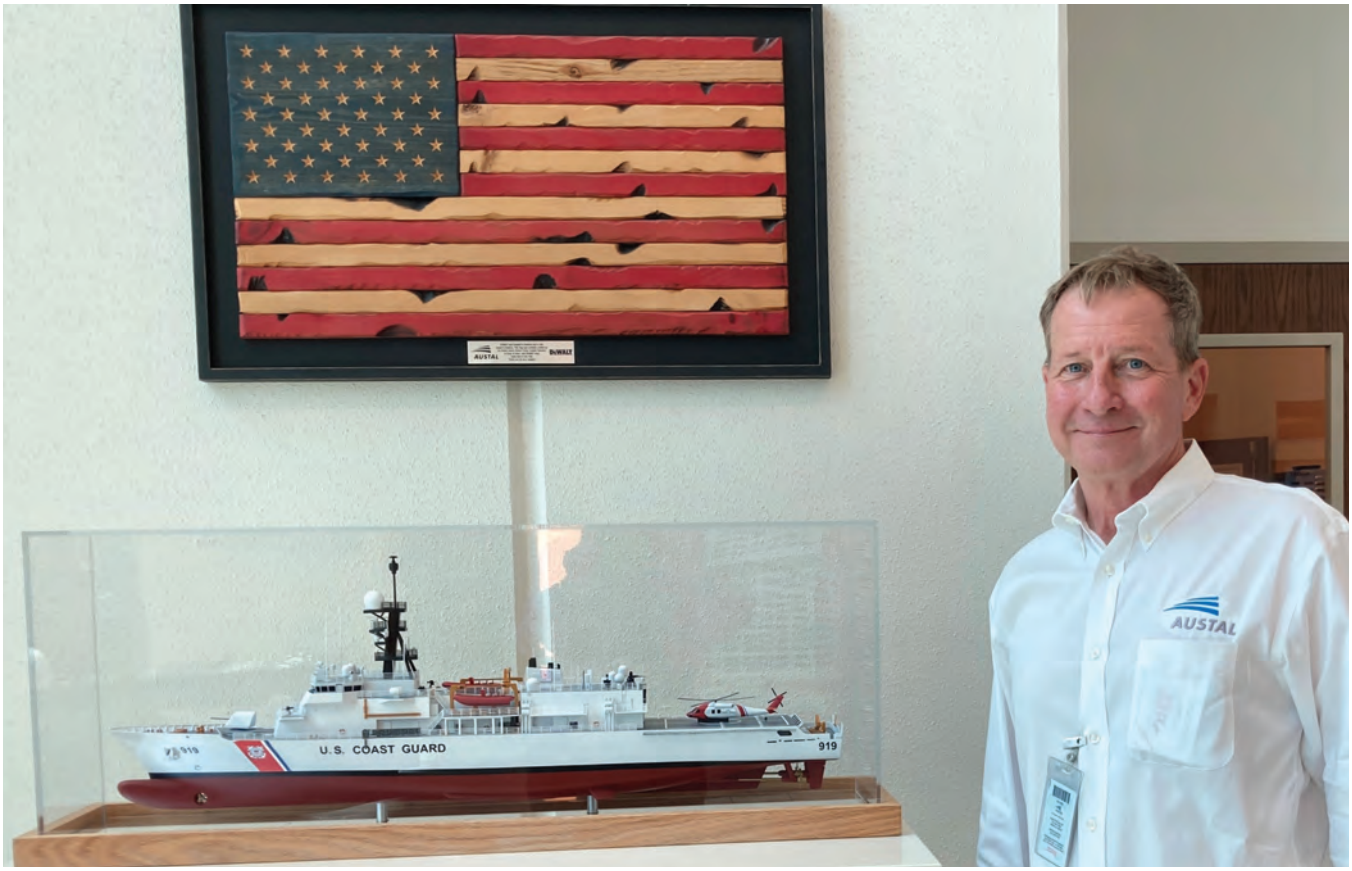
The Mobile yard includes more than 1 million square feet of indoor production space, a 740,000-sq.-ft. module manufacturing facility, a 117,000-sq.-ft. steel panel line, and an 18-acre vessel completion yard. The company is now investing an additional $800 million in expansions, including 560,000 square feet of new production facilities, a move that will bring Austal's capital investment in the yard to more than $1 billion by 2026. The new infrastructure will include a shiplift capable of handling vessels over 18,000 long tons and a 369,600-square-foot facility dedicated to submarine module production.

EVOLVING TO STEEL CONSTRUCTION

Austal USA's evolution from an aluminum-only builder to a balanced steel-and-aluminum shipbuilder has unlocked new opportunities. Its portfolio now spans the OPC, TAGOS, Columbia- and Virginia-class submarine modules, and autonomous vessel programs, while its legacy Independence-class LCS and Expeditionary Fast Transport (EPF) programs are approaching completion.

"We're successfully executing on both surface ships and submarine modules," Ryder said. "That speaks to the versatility of our workforce and facilities to adapt to the Nation's maritime needs."

The company also operates a technology center in Charlottesville, Va., and leads the Navy's additive manufacturing



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program at the AM Center of Excellence in Danville, Va., building a network of qualified vendors capable of supplying critical submarine parts.

Beyond new construction, Austal USA has built a strong repair business anchored by its 15-acre San Diego facility adjacent to Naval Base San Diego. This site is being outfitted with a dry dock capable of docking LCS, National Security Cutters, and future frigates. Additional service centers in Mobile and Singapore provide lifecycle support for Navy and Military Sealift Command vessels.

THE TRUMP BUMP

For Ryder, the Trump Administration's Executive Orders, the SHIPS Act, and increased funding for maritime priorities represent a long-overdue shift in U.S. policy. "Tools like these are critical to building a strong domestic maritime base," he said.

This new policy environment is enabling Austal to accelerate investments and pursue programs vital to the Navy's future force structure. "We're very bullish on our continued growth," Ryder said, noting that the submarine industrial base, the OPC program, and autonomous vessel development will remain major focus areas in the next two to three years.

Alongside its physical expansion, Austal is investing in advanced manufacturing technologies, business system transformation leveraging AI, and workforce development initiatives to ensure it can meet the growing demand for maritime capabilities.

Austal USA at a Glance

Founded:	1999
Headquarters:	Mobile, Alabama (180 acres on Mobile Bay)
Employees:	Thousands across Alabama, Virginia, California, and Singapore
Production Space:	More than 1M sq. ft., with 560,000 sq. ft. under construction
Major Programs:	Offshore Patrol Cutter (OPC), TAGOS, Virginia- and Columbia-class submarine modules, autonomous vessels
Legacy Deliveries:	32 U.S. Navy ships (average 2/year since 2009)
Capital Investment:	$1B by 2026, including new submarine and surface-ship facilities and a shiplift for vessels over 18,000 long tons
Repair Operations:	15-acre San Diego facility (future dry dock) + service centers in Mobile and Singapore

THOMA-SEA BUILDING BIG, THINKING BIGGER

All images courtesy Thoma-Sea

For Walter Thomassie, Managing Director of Thoma-Sea Marine Constructors (TMC), shipbuilding isn't just a profession, it's a legacy. A second-generation leader of the Houma, La.-based family business, Thomassie has spent his life immersed in the maritime industry. From pulling fishing gear as a teenager to managing the construction of complex, high-value vessels, his journey mirrors the evolution of Thoma-Sea itself: from a small, vertically integrated seafood operation to one of the nation's most respected mid-sized shipyards.

"I came up as a teenager and young adult in a vertically integrated seafood business catching and processing shrimp, tuna, and swordfish," Thomassie recalls. "My brothers and I grew up doing everything—diesel mechanics, welding, refrigeration, digging ditches, shoveling shrimp. You name it, we did it with our own hands."

That hands-on experience shaped his approach to shipbuilding.

When his father, Robert Thomassie, transitioned the family business into shipyard operations in 1990, effectively reviving a defunct waterfront facility in Houma, Walter followed. By 2002, he was working full time in the yard, and in 2010 he took the reins as Managing Director after his father's retirement.

"Being involved in a hands-on family business taught me lessons that have proven invaluable," Thomassie says. "Many of the projects we take on are complex and high value, and you can't manage them effectively without understanding the work at every level."

PUNCHING ABOVE ITS WEIGHT CLASS

Today, Thoma-Sea operates as a small-to-medium-sized shipbuilding and repair company with three facilities: two new-construction yards and one dedicated to repair and conversion, covering more than 100 acres of waterfront property. The company employs over 500 people and has the capacity to deliver 10–12,000 tons of steel production annually, managing as many as 10 vessel deliveries per year during peak production cycles. Its portfolio is impressively diverse: offshore supply vessels, well stimulation ships, hydrographic research vessels, inland and offshore tugs, ferries, seismic research ships, specialty vessels, barges, and complex trawler-processors. That versatility has made Thoma-Sea a preferred builder for both commercial and government clients, including next-generation NOAA research vessels now under construction.

"Thoma-Sea has grown with a proven ability to design, manage, and execute complex marine construction projects from concept through delivery," Thomassie explains. "We truly have a team that punches above its weight class."

Thoma-Sea's portfolio is diverse: OSVs, well stimulation ships, research vessels, inland and offshore tugs, ferries, seismic research ships, specialty vessels, barges, and complex trawler-processors.

THE ARCTIC FJORD

If one project showcases the yard's cumulative capabilities, it's the Arctic Fjord. Delivered in 2023 for the pollock fishery, the 99.3-meter trawler-processor is a marvel of design and execution—built during the twin challenges of the COVID-19 pandemic and Hurricane Ida.

"The Arctic Fjord represents the latest and largest new construction of a pollock factory trawler built in the U.S.," Thomassie says. Designed by Kongsberg, the vessel combines optimized hull efficiency, energy recovery systems, and state-of-the-art accommodations for 152 personnel.

The complexity of the vessel pushed TMC's team to innovate. "We performed more than 90% of the steel forming in-house, including frame bending," Thomassie explains. The vessel's sophisticated trawl system includes 14 remote-controlled winches with advanced sensors and feedback loops. Its pilot house command center integrates multiple navigation, sonar, and communications feeds—rivaling the NOAA research ships TMC is now building.

The factory deck features a cascading refrigeration system and an automated packaging and palletizing line designed for safety and efficiency, replacing manual methods of handling frozen cargo.

"This ship wasn't supposed to be possible for a company of our size," Thomassie says. "It was a true feat of engineering, planning, and execution—and a testament to the strength of our team and our collaborative relationship with the vessel owner."

THE TRUMP BUMP

Thomassie sees promising signs in the Trump administration's prioritization of the U.S. marine industrial base. "While other administrations have supported U.S. shipbuilding efforts, the current administration is putting a much larger emphasis on shipbuilding and the Marine Industrial Base than previous ones," he notes.

That attention could eventually benefit mid-sized yards like Thoma-Sea, if the policies are crafted with them in mind. "Mid and small-tier shipyards represent a significant portion of the nation's capacity. This sector is a valuable resource that can be leveraged for growth, especially in addressing supply chain constraints," Thomassie says.

Looking ahead, Thomassie believes federal engagement and commercial investment must go hand in hand to strengthen America's shipbuilding capacity. "Our hope is that the administration further engages with the commercial industry to create effective programs—ones that are practical and realistic for stakeholders," he says.

GREEN METHANOL: A SCALABLE DECARBONIZATION PATH FOR MARITIME SHIPPING

By Alexander Koukoulas, Ph.D., *AFRY Management Consulting*

Maritime shipping, responsible for nearly 3% of global carbon dioxide (CO2) emissions, stands at a pivotal crossroads. Regulatory demands are intensifying, customer expectations are shifting, and energy markets are in flux. In this environment, green methanol is emerging as the only truly scalable low-carbon fuel solution in the short- to medium-term.

The Regulatory Tidal Wave

Shipping is no longer exempt from the decarbonization mandates reshaping global transportation. At the international level, the International Maritime Organization (IMO) has adopted increasingly ambitious greenhouse gas (GHG) reduction targets, including a 20% reduction by 2030 (with an aspiration to reach 30%), a 70% reduction by 2040, and net-zero emissions by 2050. Complementing this, the European Union has introduced the FuelEU Maritime regulation, which sets GHG intensity reduction requirements of 2% in 2025, 6% by 2030, and 80% by 2050.

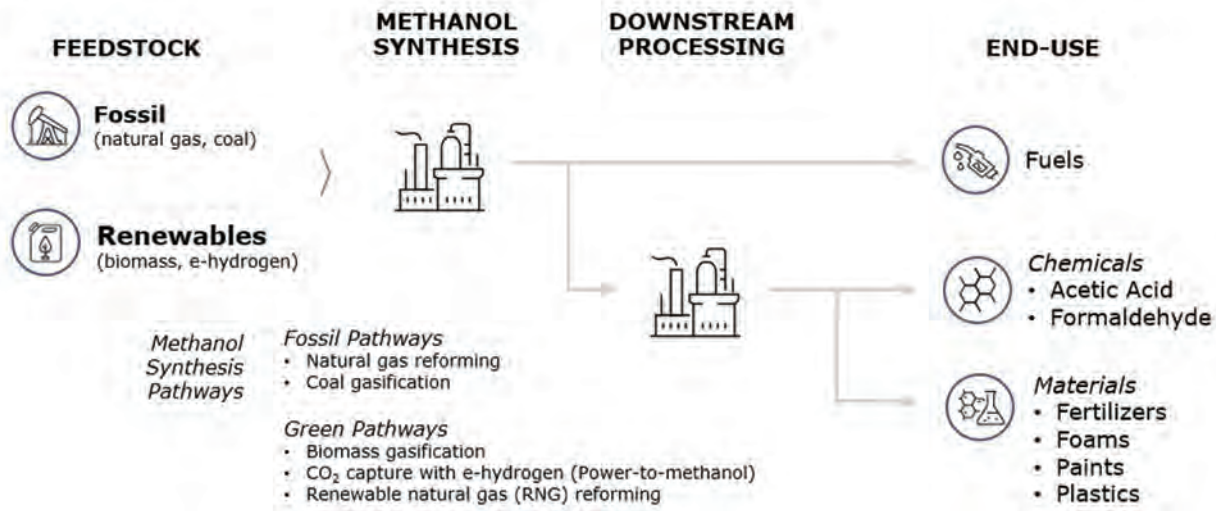
Additionally, the EU Emissions Trading System (ETS) now includes maritime emissions, with 100% of emissions on intra-EU voyages and 50% of extra-EU voyages covered by 2026.

The combined effect of these measures is clear: shipping companies must act now or face steep compliance costs, reduced competitiveness, and reputational risk.

Why Green Methanol?

Among the array of low-carbon marine fuels, green methanol — produced either from biomass (bio-methanol) or renewable electricity and captured CO2 (e-methanol) — offers a uniquely viable path forward (**see Figure 1**). Unlike hydro-

FIGURE 1: Pathway options for methanol production from fossil and renewable feedstocks, highlighting competing end uses in fuels, chemicals, and materials markets.



gen or ammonia, green methanol can be stored and handled using existing infrastructure with only moderate adaptation. It has a lower energy density than traditional marine fuels, but its well-to-wake emissions can be reduced by over 80% or more depending on the production pathway. When produced using low-carbon feedstocks such as renewable natural gas (RNG) and paired with carbon capture technologies, methanol can achieve ultra-low—potentially even negative—lifecycle carbon intensities.

Critically, green methanol is the only alternative fuel with:

- A growing commercial supply base
- Established safety protocols
- Compatibility with dual-fuel engine designs already in use

Major shipping companies are already investing in methanol-capable fleets. A.P. Moller–Maersk has ordered over 25 dual-fuel methanol vessels and began taking deliveries in 2024. CMA CGM and COSCO have also committed to methanol-fueled newbuilds, recognizing the flexibility and lower lifecycle emissions of this fuel. Engine manufacturers such as Everllence, Wärtsilä and Caterpillar are scaling up dual-fuel methanol engine offerings, further reinforcing the viability of this pathway.

Methanol vs LNG

While both methanol and liquefied natural gas (LNG) are viewed as transitional fuels, methanol holds distinct advantages in certain applications. LNG infrastructure requires cryogenic systems and extensive safety protocols, which adds complexity and cost, especially for smaller ports and operators. In contrast, methanol is liquid at ambient temperatures and compatible with conventional bunkering systems, reducing the barrier to entry.

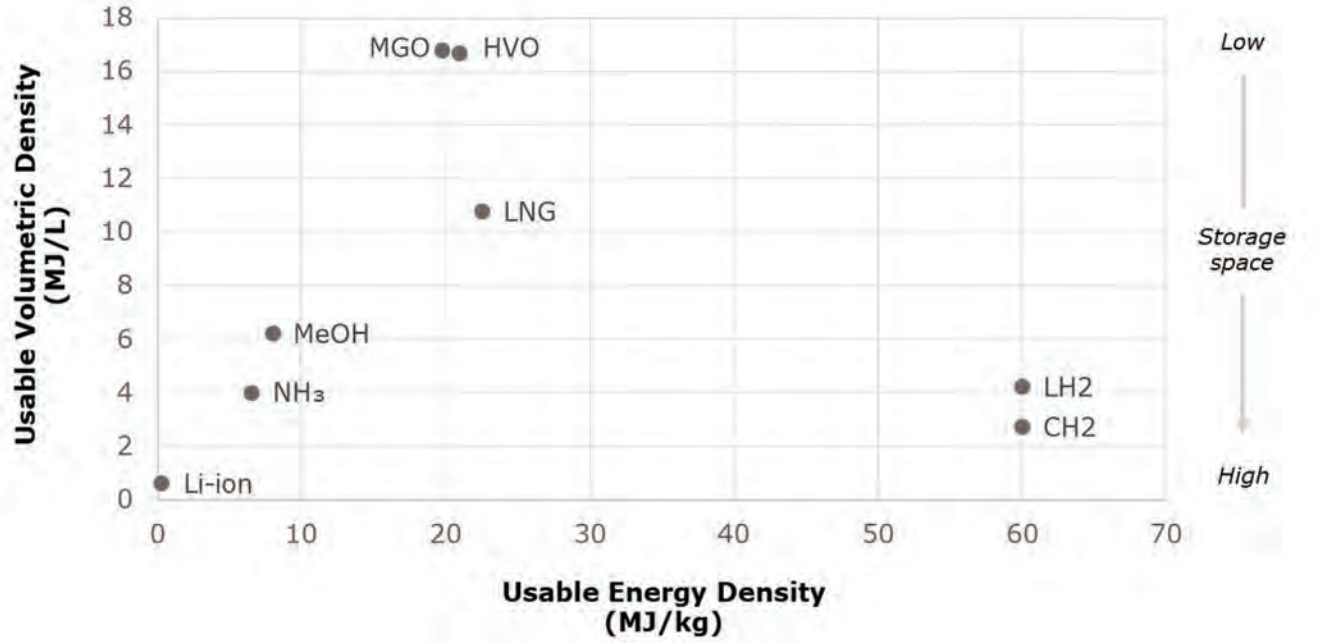
From a climate perspective, methanol—especially if produced renewably—offers significantly lower well-to-wake GHG emissions than LNG. LNG's lifecycle emissions are penalized by methane slip during production, transport, and combustion. Methanol avoids this issue, and with proper feedstock sourcing and certification, its climate benefits are verifiable and substantial.

Methanol's comparatively lower energy density can be offset by its easier storage and retrofitting potential. For container, short-sea, and roll-on, roll-off (RoRo) shipping segments, where operational flexibility and port infrastructure are key considerations, methanol offers a pragmatic and potentially future-proof solution.

Scaling Green Methanol: Lessons from Practice

As of 2023–2024, global production of green methanol—encompassing both bio methanol and e methanol—remains limited, accounting for less than 0.1% of the energy demand in the maritime sector. While current capacity stands at approximately 0.5 million tonnes per year, announced projects suggest this could grow to nearly 40 million tonnes annually

FIGURE 2: Marine fuel options based on energy density and conversion efficiency (useable energy density) relative to marine gas oil (MGO) and other fuel options: ammonia (NH3), compressed hydrogen (CH2), hydrogenated vegetable oil (HVO), lithium ion battery (Li-ion), liquified hydrogen (LH2), and liquified natural gas (LNG).



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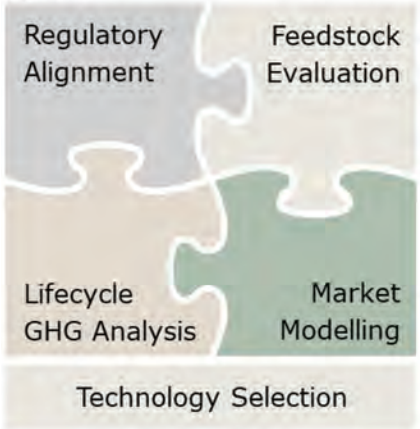
by 2030, representing up to 5% of global maritime fuel energy demand. However, due to the high-risk nature of many of these projects, actual realized volumes are expected to fall well short of announced figures. Notable facilities under development include Spain's White Summit plant (100 kt/year of e methanol expected by 2027) and Repsol's Tarragona facility (240 kt/year by 2029).

In AFRY's experience, successfully advancing maritime decarbonization—particularly through green methanol—requires a combination of robust technical assessment, strategic alignment with regulatory frameworks, and integration across operational systems (**see Figure 3**). Best practices observed across multiple engagements include:

- **Regulatory alignment:** Understanding and interpreting evolving global and regional frameworks (e.g., RED III, FuelEU Maritime, EU ETS, and IMO targets) is critical for investment planning and risk mitigation. Successful projects are grounded in detailed analysis of regulatory incentives, obligations, and certification pathways.

FIGURE 3: Technology selection is guided by regulatory, feedstock, market, and GHG considerations, ensuring the optimal solution for project success.

Figure 3



- **Feedstock evaluation:** Careful assessment of biogenic residues, renewable electricity availability, and carbon capture potential informs the viability and sustainability of methanol production. Projects that prioritize traceable, low-CI feedstocks tend to achieve stronger positioning under emerging carbon accounting rules.
- **Market modelling:** Scenario-based modelling of demand, pricing trends, and supply chain risks helps stakeholders make informed decisions in a volatile and still-developing fuel market. Proprietary data and regional insights can play a central role in narrowing uncertainty.
- **Lifecycle GHG analysis:** High-performing initiatives rely on well-to-wake lifecycle carbon intensity modelling to support procurement decisions, third-party reporting, and customer engagement strategies.

These components are most effective when considered within an integrated framework — one that connects fuel strategy to vessel performance, operational optimization, and port infrastructure readiness.

Managing Complexity i

Fuel switching alone is rarely sufficient. AFRY's work across multiple project types has shown that effective maritime decarbonization requires coordinated planning across the value chain. This includes:

- Technical and commercial due diligence for methanol production and supply partners
- Evaluation of retrofit and newbuild economics under different fuel scenarios
- Advisory on infrastructure development, procurement, and off-take structuring

A recurring theme is the importance of aligning investment timing with regulatory milestones and customer sustainability demands. Projects that anticipate rather than react to external drivers tend to capture first-mover advantages.

Strategic Considerations

Green methanol is already being deployed at scale and is one of the few fuels with a clear pathway to regulatory compliance, operational integration, and lifecycle impact verification. As the landscape continues to evolve through 2030, early movers are likely to benefit from more stable supply arrangements, greater flexibility in customer offerings, and differentiated access to capital. Organizations seeking to navigate this transition effectively will need to combine technical insight with strategic foresight, drawing on best practices that reflect the complexity and interdependence of the maritime energy system.

In the Shipyard

New Orders | *Deliveries* | *Launched* | *New Concepts*

Inkfish Orders New Research Vessel

Vard

Inkfish signed on with **Vard** for the design and construction of a new research vessel with a total package deal of $233m. The custom-built research vessel, designated Project RV6000, is designed for scientific exploration and will join Inkfish's expanding fleet, alongside the RV Hydra and RV Dagon, to support global marine research. The vessel is designed for seabed mapping, submersible support, and ROV operations. It will be 100 meters long and 20.7 meters wide, with a maximum speed of 15 knots and an operational autonomy of up to 30 days.

The RV6000 will be equipped with an ROV capable of operating at depths of up to 6,000m. It will be capable of supporting two manned submersibles and will feature an A-Frame system aft and a large hangar for maintenance and storage. An offshore crane equipped with an AHC system will be installed on the starboard side for operations at depths of up to 2,500 meters. The vessel will be equipped with a hydroacoustic survey system capable of high-resolution seabed mapping, with a resolution of 0.5 x 1 degree, and analyzing the water column at all depths.

The technical configuration includes hybrid power generation and propulsion. The hull is designed to ensure advanced seabed mapping performance and excellent seakeeping qualities, thanks to anti-roll technologies that reduce movement and acceleration, ensuring excellent hovering performance. The ship will also be equipped with laboratories, offices, and workshops, as well as accommodations and recreational areas designed for maximum comfort.

These spaces will accommodate up to 70 crew members and researchers and will meet the stringent requirements of the DNV COMF (Comfort Class) notation, ensuring low noise and vibration levels.

VARD will manage the entire vessel construction process, from hull design and construction to outfitting, integration, and commissioning, including supply by the Group's subsidiaries: Seaonics, Vard Electro, and Vard Interiors. The hull will be built at one of VARD's shipyards in Romania, while final outfitting, commissioning, and delivery will take place at one of the Group's shipyards in Norway. Delivery is scheduled for the second quarter of 2028.

Van Oord Orders Subsea Rock Installation Vessels

Van Oord

Van Oord ordered new Subsea Rock installation vessels to be built at Yantai CIMC Raffles Offshore in China.

Capable of operating on methanol and with a focus on innovation and automation, the first vessel is expected to enter the market in 2028, with a second vessel expected to follow within one year.

Subsea Rock Installation, pioneered by Van Oord since the 1970s, is vital for protecting and stabilizing offshore energy assets.

The new vessels will be equipped with a substantial loading capacity of 35,000 tons, capable of handling large rock sizes, and feature a DP-2 dynamic positioning system. The sustainable design of the vessels includes multi-fuel engines (biofuel and methanol), a DC-grid with large battery storage capacity, and an energy-efficient hull design and rock handling system.

New Deliveries

Van Oord WTIV Boreas

Van Oord christened Boreas, named after the Greek god of the Northern winds. It is purpose-built for the transport and installation of next-generation foundations and turbines for offshore wind farms. The vessel measures 175m in length and its crane has a 155-m-high boom, able to lift over 3,000 tons. With Boreas, Van Oord can install offshore wind turbines of more than 20 MW. "Boreas is the largest investment in our company's history," said **Govert van Oord, CEO, Van Oord**. "With the Boreas being able to operate on methanol, we have added a new chapter to our net-zero emissions journey."

Operating on methanol reduces its carbon footprint by over 78%. Additionally, the vessel features Selective Catalytic Reduction to minimize nitrogen oxide emissions, and a battery pack of more than 6,000 kW-hours, which helps further reduce fuel consumption and emissions. After the christening ceremony the Boreas will head to its first offshore wind project, the 1.6-GW wind-farm cluster Nordseecluster in the German North Sea, a joint venture between RWE (51%) and Norges Bank Management Investment (49%). Van Oord's scope includes the installation of 104 extended monopiles as well as scour protection.

Van Oord

In the Shipyard

New Orders | **Deliveries** | *Launched* | *New Concepts*

AAL Shipping

AAL Dammam Delivered in China

AAL Shipping (AAL) took delivery of its sixth 32,000-deadweight (DWT), 700 metric ton heavy lift Super B-Class vessel - AAL Dammam. Unveiled at a naming ceremony at the **CSSC Huangpu Wenchong Shipyard** in Guangzhou, China, she is part of an eight-vessel newbuild fleet totaling 256,000 DWT. The methanol-ready, dual-fuel AAL Dammam was engineered to transport a vast array of multipurpose cargoes including heavy lift project components, breakbulk, and dry bulk all on a single voyage.

The 41,500 cubic meter newbuild has a length of 179.9 meters and a breadth of 30 meters. She can accommodate over 100,000 freight tons of breakbulk and heavy lift cargo and is equipped with three 350 MT heavy lift cranes, combinable up to a 700 MT maximum. Two large, box-shaped cargo holds are optimized for dry bulk, featuring adjustable pontoon triple decks and no centre-line bulkhead.

In 2026, AAL will take delivery of its final two Super B-Class vessels — the AAL Newcastle and AAL Mumbai — which will feature an increased maximum heavy lift capability of 800 MT.

Seatrium Delivers Turnkey FPSO to Petrobras

Seatrium Limited announced the impending delivery of the **PETROBRAS** 78 (P-78) - the first of a series of turnkey Floating Production Storage and Offloading vessels (FPSO), to Brazil's National Oil Company, Petroleo Brasileiro S.A (Petrobras).

Upon delivery, P-78 will be deployed in Brazil's prolific Buzios field, the largest deepwater oil field globally, with a production capacity of 180,000 barrels of oil per day (bopd), 7.2 million cubic meters (mcbm) of gas per day, and a storage capacity of 2 million barrels of oil. The P-78 will rank among the largest in the global operating fleet of FPSOs.

Seatrium's global teams fabricated the topside modules weighing 54,000 MT across its shipyards in Singapore, China and Brazil, in addition to the integration and commissioning works of the P-78 FPSO in Singapore.

Seatrium

RAstar Tugboat Delivered to Egyptian Navy

Robert Allan Ltd.

The Ras Alhekma terminal support/escort tug has been delivered to the **Egyptian Navy** in Alexandria, Egypt. The name, Ras Alhekma is a coastal region located on a cape along Egypt's Mediterranean shoreline. The RAstar 3200-W series tug was recently completed at Alexandria Shipyard and is the first of series of five that are being built in the yard.

The RAstar escort series tug features unique sponsoned hull form developed by **Robert Allan Ltd.**, which has been proven to provide significantly enhanced escort towing and seakeeping performance. All provide high bollard pull, power, maneuverability with the Ras Alhekma receiving positive feedback during trials from the owner including low noise levels of the tug due to noise treatments designed by this office and applied by the shipyard. As one of the biggest shipyards in Africa and the Middle East area, Alexandria Shipyard carried out the production design by its own technical team.

Oceania Allura Delivered

Fincantieri and **Oceania Cruises** – a brand of Norwegian Cruise Line Holdings Ltd. – celebrated the delivery of Oceania Allura at the Sestri Ponente shipyard. The ship is the latest addition to the shipowner's fleet and is a sister ship to Oceania Vista, delivered by the same shipyard in 2023.

At approximately 68,000 gross tons, 246 meters long, and accommodating 1,200 guests in 600 cabins, Oceania Allura is aiming to offer elegance, fine dining and destination-focused voyages.

With the two cruise ships recently ordered, Oceania Cruises' expansion plan now includes a total of four next-generation ships, with deliveries scheduled between 2027 and 2035.

Furthermore, Oceania Sonata, the first unit of the new Sonata class, is already under construction at the Marghera shipyard. It will accommodate 1,390 passengers and will be delivered in 2027. Its sister ship, Oceania Arietta, will follow in 2029.

Fincantieri

In the Shipyard

New Orders | *Deliveries* | **Launched** | *New Concepts*

New Deliveries — Star of the Seas Delivered to Royal Caribbean

Meyer Turku/Mediascope Productions

Meyer Turku delivered Star of the Seas – the second Icon class ship built at the Meyer Turku shipyard – to **Royal Caribbean**. The 365 x 48.5m, Bahamas-flag ship can accommodate 7,600 passengers and 2,350 crew. Star of the Seas' eight different 'neighborhoods' include the largest water park in the seas, the Central Park with live plants, the AquaTheatre with water acrobatics and around 40 different places to eat. The cabin and entertainment solutions of this state-of-the-art ship have been developed in cooperation with long-standing partners of Meyer Turku Shipyard. The third ship in the series, Legend of the Seas, will after the summer be floated out from the dry dock to the outfitting pier.

Launched — HII Christens Jeremiah Denton (DDG 129)

HII

HII christened the future USS Jeremiah Denton (DDG 129), the third Flight III Arleigh Burke-class destroyer to be built at the company's **Ingalls Shipbuilding division.** The ship's name honors former **U.S. Sen. Jeremiah Denton Jr.**, a Vietnam War veteran who was awarded the Navy Cross for his heroism as a prisoner of war. He spent 34 years as a naval aviator, including eight years as a prisoner of war in Vietnam. He is known for his act of genius during a televised broadcast in captivity, when Denton spelled out the word "torture" through Morse code using his eyes to blink the code. Following his Navy career, Denton was elected to the U.S. Senate representing his home state of Alabama in 1980.

Ifremer's New RV Launched in Spain

Ifremer/Freire Shipyard

A new research vessel built for the French oceanographic fleet operated for the National Science Community by the **French national Institute of Ocean Sciences (IFREMER)** has been launched at the **Freire Shipyard** celebrated in Vigo, Spain.

The oceanographic vessel was named Anita Conti in honor of France's first woman oceanographer, as a tribute to her pioneering legacy in the exploration and study of the sea.

Designed to replace the vessel Thalia, the Anita Conti will fully integrate the French Oceanographic Fleet in 2026. It will be capable of operating advanced underwater vehicles such as AsterX, IdefX, UlyX and Ariane.

The French-flagged oceanographic vessel will measure 45 x 11.5m, designed to carry out research missions in coastal areas in mainland French waters (Bay of Biscay, Channel) but may also be deployed in certain years on the coast of Africa and in the Antilles and French West Indies-Guyana zone. It will house a crew of 12 people and 10 scientists.

The Anita Conti stands out for the wide range of energy-saving technologies and low-consumption solutions implemented - from the design of the hull, the design of the electrical plant, the energy distribution system, the heat recovery system, the level of thermal insulation to the efficiency of the air conditioning.

The diesel-electric propulsion system will be composed of three variable-speed, biodiesel-compatible generator sets feeding two shaft lines driven by electric motors and a direct current (DC) electrical distribution system.

This set, together with a battery pack, will enable very good energy efficiency, optimization of consumption, operational redundancy and compliance with acoustic requirements according to BV COMF 2 class notation and DNV SILENT-F standard.

The dynamic positioning system and the electric bow thruster improve the vessel's maneuverability.

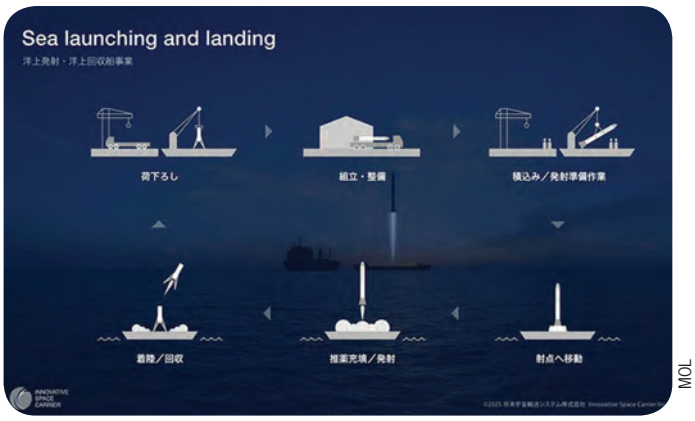
Anita Conti will be equipped with a gondola under the hull housing all the acoustic transducers that will enable it to explore and map the seabed and water column. It also has laboratories and a scientific PC.

The vessel will feature an oceanographic marine telescopic main crane at the stern for marine use for launching and retrieval of scientific equipment and general maneuvering at the stern of the vessel. In addition, it will have an A-type stern gantry, a T-type side gantry. For scientific fishing operations, this vessel will also have two trawling winches and a removable net drum.

MOL Enters the Maritime Space Race

Mitsui O.S.K. Lines is moving toward commercializing an offshore rocket launch and recovery vessel through a partnership with Innovative Space Carrier (ISC) and Tsuneishi Solutions TokyoBay Co. (formerly Mitsui E&S Shipbuilding Co., Ltd).

MOL's engagement in space-related business focuses on the offshore launch and recovery of rockets. Aiming for commercialization around 2030, its first step will be to develop a recovery vessel, followed by a feasibility study of the commercialization of an offshore launch vessel. By successfully developing and introducing such vessels, the company will contribute to the development of a new space infrastructure that utilizes the ocean and supports next-generation space transport. In this project, MOL will collaborate with ISC and Tsuneishi Solutions TokyoBay to realize offshore rocket launch and recovery, with the aim of increasing the frequency of rocket launches. Leveraging the technology and expertise it has cultivated in the shipping and offshore businesses, MOL will continue to create new value for society across a wide range of fields in the space industry as well.



MOL

World-First LCO_2 / Methanol Carrier gets AIP Green Light

MHI/MOL

Mitsubishi Shipbuilding and Mitsui O.S.K. Lines acquired Approval in Principle (AiP) from ClassNK for the jointly developed liquefied CO2 (LCO2) / methanol carrier. The vessel is based on a low-pressure LCO2 carrier. It aims to transport CO2, which serves as raw material, on outward voyages and synthetic methanol on return voyages. Use of dedicated vessels for CO2 or methanol results in empty-cargo operation on half of their trips. If dual transport of CO2 and methanol is achieved, empty-cargo trips can be eliminated, thereby improving overall transport efficiency. Mitsubishi Shipbuilding and MOL will move forward with the development of the LCO2 / methanol carrier, building on the findings and technical challenges identified during the concept study. The goal is to achieve commercialization of the LCO2 / methanol carrier through collaboration with relevant companies in the supply chain and other partners.

U.S. SHIPBUILDING:
AMERICAN MARITIME DOMINANCE REQUIRES A NEW ECOSYSTEM

With all the Legislative fanfare, Executive Orders, Committee meetings, lobbying efforts and media announcements concerning American Shipbuilding, Naval Warfare and Maritime Dominance, it is no surprise that the result of the uproar is shear confusion within the maritime industrial base (MIB). The April 9, 2025 Executive Order Restoring America's Maritime Dominance lists more than several reports to the President due within 90 days. Following those initial updates other reports are due at 180 and 210 days. The industry as a whole has not seen references to any of the reports being completed. That said, over the years we have seen many Federal transportation programs with good intentions end up with only reports and little to no investment. To support that opinion, the latest GAO report on shipbuilding described the industry as a "perpetual stage of triage."

As shipbuilders and operators, we are simply confused about the path forward. Is the support and funding commercial or is it governmental? Is the revitalization of the Industrial base based upon legislation, public-private partnerships, private investment, or government subsidy? With those questions coming from many different Federal and private sources, we ask if a "shipbuilding" rebirth is an attempt to satisfy the status quo or is it better served organically by providing new technology, deregulation, programs and private investment to reach new capacity and services.

In nature Ecology defines the interrelations among organisms and their environments. With those relations nature builds populations and those populations develop into communities. The result in many natural environments is a sustainable and supportive ecosystem. U.S. Maritime needs to combine its Naval components with its global commercial requirements. It needs a new ecosystem. Major changes are required if the MIB is looking to compete globally and reclaim its former reputation and position in both geopolitical circles and commodity markets.

Image courtesy Maritime Operations Group

Is the "eco" comparison a little too "Jurassic Park"?

Maybe not.

An ecosystem engineer in nature is any species that is capable of changing its environment. An "allogenic" engineer changes the habitats around them while an "autogenic" engineer alters its own structure. Think US Navy and a military industrial base as "allogenic" and commercial shipping and markets as "autogenic". In our opinion the new "ecosystem" in U.S shipping must move beyond a request for "dual use" tonnage and look to combine funding, procedure and technology of both military and commercial vessels to move forward as a sustainable community.

Our reputation and strengths are not only based on our military capability. ***The respect from our international partners and allies has also been based on our historical humanitarian aid and service.*** With the current geopolitical events in the Middle East, Ukraine and the Indo-Pacific the sight of an American merchant vessel, fully loaded with cargo and flying the stars and stripes would be a welcome sign in those theatres and can easily assist in rebuilding U.S. manufacturing and agriculture. With that injection of US assets and seafarers, National Security and Force protection follows. We extend our Naval power by providing protection of those commercial assets with new services and applications.

The recent One Big Beautiful Bill includes significant funding for the Navy, particularly in shipbuilding, and autonomous systems. The bill allocates roughly $40 billion dollars for the procurement of new ships, unmanned vessels, and the development of modernizing naval shipyards. All of this funding is outside of the normal defense budget legislation request for 2026 at $292.2 billion. The new law also includes a significant funding for the U.S. Coast Guard, totaling nearly $25 billion, reported as the largest single commitment of funding in the Service's history. This funding will also be used for shipbuilding, shore facilities, and maintenance. Again, this is specific funding for shipbuilding outside of the normal Coast Guard Authorization legislation, Homeland Security or Defense.

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U.S. Flag Asks: Where's Our Money?

While the new law has many successful components and will increase economic growth, it ignores U.S. Flag commercial shipping or shipbuilding. We wait on trust fund allocation from Chinese tariffs and development of Prosperity Zones in the Ships for Americas Act or as referenced in the EO. Pending legislation that is absent of any true government funding to complete the huge task of rebuilding America's commercial shipbuilding capability. Make no mistake, existing shipyards, greenfield start-ups and recent foreign purchases of U.S. facilities will follow the defense funding.

It is our opinion that few if any of the "start-ups" understand the enormous task at hand while they "pitch" future facilities. Our existing shipyard capacity will be booked and backlogged with Navy and USCG work at cost levels that do not take into account the availability of private investment or the cost savings that commercial involvement can bring to the table. Our new foreign partners will follow the defense money and well they should if their initial entrance into the system will be successful. The reallocation of even "table scrap" funding provided outside any MarAd or Transportation budget allocation as large as these would move commercial shipyards into a new era and put new bottoms both on the water and under the water.

The ecosystem can move beyond the actual ship building initiative as there are many examples of adopting commercial inspection, contracting, purchasing procedures and services that can work to alleviate the Navy's & USCG maintenance and ship construction delays and costs. Recent analysis out of Ukraine indicates that the government bureaucracy was the lead problem to move procedures and manufacturing forward and the digital adoption of commercial applications was the single element that accelerated funding and startup of the war effort. The collaborative effort goes beyond existing design, performance and operation. Moving certain Navy and USCG tasks into commercial services can take us past "dual use" recommendations and into ship types and design that not only move government and private cargo but are also immediately applied to military logistics and support operations. Establishing a new ecosystem combining military systems and commercial applications should be our first priority towards reaching a "dominance" goal.

The issues of cost over run and bureaucratic delay are most visible in the submarine industry. Taxpayers have poured billions of dollars into achieving the delivery goal of 2 Virginia plus 1 Columbia class submarine per year, yet production and maintenance schedules remain years behind. Our allies in South Korea have a thriving submarine industry that was built on their proven success in on-time, on-budget delivery of commercial vessels. How can we take advantage of this spill over from commercial to military "ecosystems"?

In a very positive step, the recently released 2026 National Defense Authorization Act, contains direct reporting requirements for the Department of Defense to analysis the "as a service" model for undersea application. Specifically, it calls for assessing the incorporation of commercial diesel-electric submarines as a service for the DoD that would function like successful programs in other domains to alleviate current delays and cost overruns.

"The committee notes that "as a service" approaches have been successfully implemented in other domains, such as the U.S. Air Force's use of contractor-owned, contractor-operated adversary air training services. These models have demonstrated the ability to provide cost-effective and flexible support to military operations while preserving high-end platforms for their most critical missions

The Honorable Tim Sheehy, Senator from Montana in a recent letter of support to Secretary of the Navy Phelan also states:

"I urge the Department to consider novel approaches to supporting critical training, research & development, and other undersea mission needs through the development of a "submarines as a service" model "

There is only one company pursuing an "as a service" model for submarines that is thoroughly grounded in reality: Maritime Operations Group. Their concept for putting more players on the field to augment the nuclear submarine force — by leveraging experienced foreign shipyards and private capital — creates exactly the kind of blended shipbuilding ecosystem and operational pressure relief valve the nation needs. This model provides immediate operational capacity while maintaining the accountability and results-driven approach that private industry demands, offering a practical bridge between commercial efficiency and military requirements that exemplifies the collaborative ecosystem described throughout this analysis.

The model replicates portions of the Ships for America Act where the construction and interaction with a foreign shipbuilding group leads to a "reflag" of the initial tonnage and in turn develops commercial building opportunities in a U.S. shipyard to build the new fleet.

Amtech has been working closely with Maritime Operations Group through their Hyundai, South Korea relationships and several U.S shipyard locations to bring that new ecosystem to fruition. It is a single example of how the new model can work to return the Nation to Maritime Dominance.

The Author

Kunkel

Robert Kunkel, president of Alternative Marine Technologies and First Harvest Navigation, served as the Federal Chairman of the Short Sea Shipping Cooperative Program under the DOT's MARAD from 2003 until 2008.

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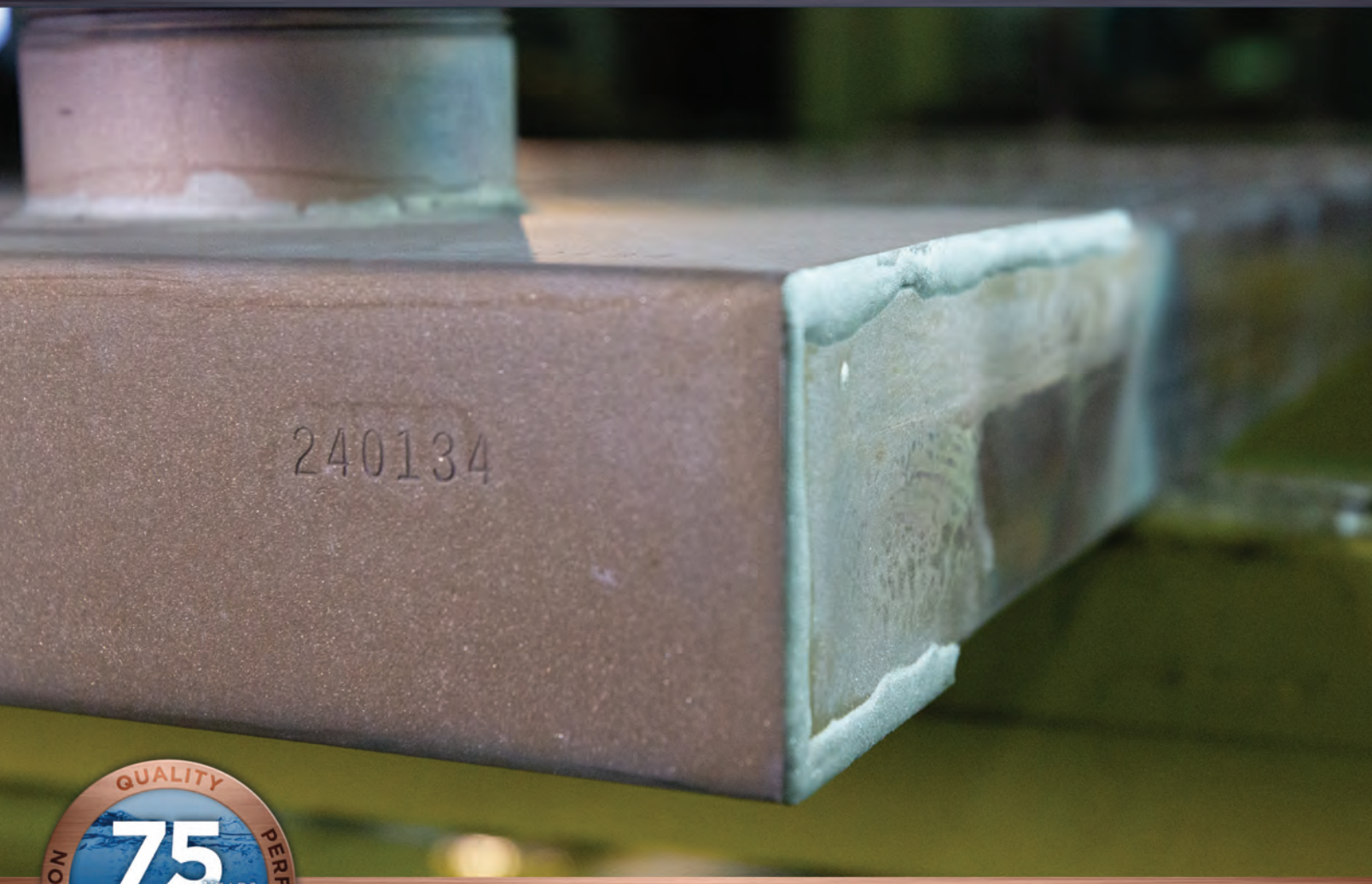

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