

MARITIME REPORTER AND ENGINEERING NEWS

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OCTOBER 2026

MSC Wants You!

*RADM Benjamin Nicholson discusses
the value proposition of a maritime
career with Military Sealift Command*

Reeferships

Resilient Link in the Cold Chain

CO₂ Storage

*New Market for Maritime
Infrastructure*

Nuclear in Maritime

*How Does the Public
Really Feel about SMRs*

Ship Design

*Who will design
America's next fleet?*

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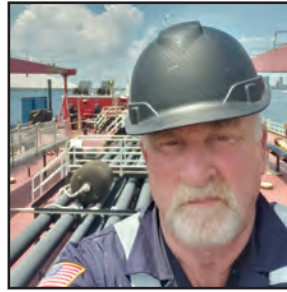
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Photo by Justin Zurra

The maritime renaissance comes at a critical juncture for many in maritime, particularly as vessel owners and operators – both domestic and abroad – search for the ‘next generation of mariners to power. Enter our early October **Maritime Matters: The Marine-Link Podcast** with **RADM Benjamin Nicholson, Commander, U.S. Navy Military Sealift Command (MSC)**.

It was not that long again that MSC had to pull ships out of service because it did not have enough qualified mariners to operate them. Pulling ships from service for any reason other than lack of demand is a bad scenario for any shipowner; Pulling ships from MSC service – the vital link which keeps the U.S. Navy running with fuel, food and critical supplies – is a national security concern.

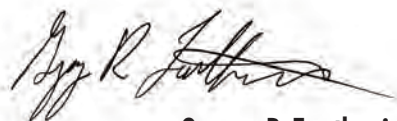
With RADM Nicholson at the helm, MSC is embarked on the mission of rebuilding its mariner roster, to not only keep MSC ships running, but to keep them running with the flexibility to allow adequate support to enable regular crew changes, as well as replacement in the times of last-minute emergencies. As RADM Nicholson discussed in detail on the podcast, MSC has made significant changes to its compensation packages, changes that make MSC competitive with commercial carriers and will help it build its mariner roster more than 50% from its current level of about 6,200 to a projected level of more than 9,300. Read the full interview with RADM Nicholson starting on page 14; listen to the full podcast by scanning the QR Code to the right.

Playing favorites is not advisable in many walks of life, but it's human nature. I've

been at this for 34 years and counting, and one of those favorites is **Morgan Fanberg, CEO, Glosten**. This month he writes our “The Final Word” slot starting on page 26 which explores the U.S.’ ‘maritime moment’ and its impact on his profession, vessel engineering and design. Since the start of 2025, chatter on all matters U.S. maritime have been front and center, more so than the previous 32 years combined. But this chatter has not trickled down to contracts and money for a majority of the U.S. industry, including naval architects and marine engineers. I've known Fanberg for many years – more professionally than personally – but each of our interviews over the years have been both informative and entertaining. Fanberg is as ‘genuine’ as they come, and he has great insight on the maritime market in overview, courtesy Glosten's deep and broad roster of vessel design from around the world.

Watch the full Podcast interview with **RADM Benjamin Nicholson, Commander, U.S. Navy Military Sealift Command:**





Gregory R. Trauthwein
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HOW DOES THE PUBLIC REALLY FEEL ABOUT SMALL MODULAR REACTORS?

By Rik van Hemmen

In a spare few minutes I took a quick look at the U.S. Center for Maritime Innovation Report: Small Modular Reactor Technologies for Maritime Applications of May 19, 2026.

As near as I can figure, it focuses on two major concerns with regard to the use of SMRs in commercial ships:

1. Insurance obstacles and
2. Possible adverse reactions by the public to nuclear commercial ships.

That is weird to me, since my major concern would be that it is taking way too long to simply build a commercial

ship with an SMR as its power source.

In a closer read of the report, I started to wonder why negative public perception and insurance are bigger concerns than the glacial pace of nuclear ship construction.

What is that concern based on? The report actually appears to rely on panel polls among the participants in the conference.

There is no actual breakdown of the participant's backgrounds, but it is interesting to note that those two primary concerns are marginal concerns; concerns of the unknown.

As near as I could figure out there is no data that shows

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Back to the Drawing Board

Image courtesy Rik van Hemmen/Al



'Excellent work, James. Your underwriter concern about nuclear ship propulsion is great for premiums.'

that there are unusual liability concerns by insurance providers and negative perception by the public.

I have lived within the insurance industry for half a century. Underwriters always have concerns, but those concerns are always papered over with premiums. That is the nature of insurance. To worry about that as a potential issue is as useless as worrying about taxes. Like taxes, insurance will be a problem and like taxes it will be resolved. Insurance is not a technical or even a social problem. It just happens, whether it is an OPA 90 resolution (pretty cool) or a national flood insurance program (pretty stupid) or health insurance (which is not really insurance anyway).

In June I attended an insurance function, and MARAD administrator Carmel, as the keynote speaker, focused on insurance for vessels with SMRs. One can assume he wanted to discuss this issue in this forum based on the results of the report.

I was sitting next to a shipowner who, before the speech actually con-

cluded, said: "Who cares about insurance. Tell me I can build ships with SMRs and we will figure out the insurance on the fly." That is what shipowners do. They find something they like, and they clear the way with their suppliers.

It also makes me think of a comment a wise attorney once made to me:

"Rik, don't invite attorneys to concept meetings, they will think of so many potential barriers the concept will never get off the ground."

Add the public and politicians to the mix, and we are talking ultimate infant death.

Meanwhile, moving mountains is easy; you just do it one shovel at a time. All you need to do is bring a shovel. In this case a nuclear commercial vessel.

When the shovel shows up, we will know what the public thinks of it. You can only get a real public reaction to a real thing. If we asked the public's reaction as to whether it would be smart

to put a man on the moon before we started the project, the public would have called it crazy, and they were all wrong because they knew nothing about getting a man on the moon.

I don't think there is any data on the public's attitude to nuclear commercial vessels. As a matter of fact, when I AI'd that issue it basically copied the sentiment in the report, but provided no background data (a classic case of AI groupthink). Quite frankly, to ask the public about commercial nuclear vessels is pointless since they have never dealt with one.

But let's look at the real world. When was the last time there was a demonstration against nuclear power at all? And if there was such a demonstration it was a NIMBY demonstration, and if there is one thing maritime is famous for it is a lack of backyards. As a matter of fact, we know the public barely knows maritime exists.

I understand there was some tepid pushback at some ports of call for the NS Savannah in the 1960's, but the

real reason commercial nuclear propulsion failed at the time was the excessive cost of it all. (See my January 2025 discussion of NR-1 on *MarineLink.com* – <https://www.marinelink.com/news/nuclear-submarine-nr-life-actually-521328>).

I also remember that at one time New Zealand would not allow Nuclear US Navy ships to enter its ports. That was related to antiwar issues. I am sure that once the world runs nuclear commercial ships, the Kiwis will be just as desperate to ship their kiwis on nuclear vessels as the rest of the world.

Meanwhile, the US Navy, the Russians, The British Navy and the French Navy all operate nuclear vessels and where is that negative public perception?

Last year the Nuclear Submarine New Jersey was commissioned in New Jersey. A rare visit by a nuclear vessel. It was a party, and everybody came out to see it. Birdwatchers took pictures of it when it passed the tip of Sandy Hook, with happy comments as if they had sighted a roseate spoonbill flying by.

The record speaks for itself, at worst the public does not care, at best they even like it. In the last decade or so there has been a massive shift in favor of nuclear power where (according to AI) the public supports nuclear power with a 60% or more majority and is even reaching 70%. That is on land and after Fukushima!

Does it really make sense to think the public now will worry more about nuclear power on water using inherently safer nuclear reactors? Let's focus on what needs to be done, instead of focusing on unsupported marginal issues.

Let's build some nuclear commercial vessels now, and stop worrying about sailing off the edge of the world. And most of all let's not introduce edge of the world concerns in policy and technical forums.

For every column I write **MREN** makes a small contribution to an organization of my choice. For the foreseeable future I am selecting SL7Expo, an industry wide effort to develop a Smithsonian level exhibit center for commercial maritime. <https://sl7expo.org/members/>



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FROM PORTS TO POWER PLANTS DECISION INTELLIGENCE TRANSFORMS CRITICAL INFRASTRUCTURE

By Dr. Chaouki Kasmi, Chief Innovation Officer, Technology Innovation Institute (TII)

Critical infrastructure has never been more connected. Across ports, energy networks and industrial facilities, operators have access to unprecedented volumes of operational data generated by sensors, surveillance systems, satellite imagery, connected equipment and digital monitoring platforms. Every day, these technologies provide valuable insights into the performance, condition and security of critical assets. Yet despite this growing visibility, one challenge continues to persist.

The problem is no longer collecting operational data. It is understanding what matters quickly enough to anticipate emerging risks, minimize disruption and make informed operational decisions.

For years, investment in critical infrastructure has focused on expanding monitoring capabilities. More sensors, more connected devices and more operational systems have improved visibility across increasingly complex environments. While these technologies remain essential, they have also introduced a new challenge. Operators are often required to interpret fragmented information spread across multiple systems while responding to rapidly evolving operational conditions.

In this environment, visibility alone is no longer enough.

Whether managing a busy port, overseeing an energy network or monitoring geographically dispersed infrastructure, operators must bring together information from numerous sources before they can assess a situation and determine the appropriate course of action. Without that context, seemingly isolated operational signals can quickly develop into costly disruptions affecting supply chains, energy delivery and essential services.

This challenge is remarkably consistent across critical infrastructure sectors.

A modern port may simultaneously monitor vessel movements, cargo operations, weather conditions, perimeter security and logistics activity. Likewise, energy operators oversee extensive networks of pipelines, substations, generation assets and transmission infrastructure while monitoring environmental conditions, equipment performance and operational risks.

Although these environments appear very different, they share a common operational reality: multiple systems generating vast amounts of information that must be interpreted together rather than in isolation, the conversation is therefore beginning to shift.

Rather than asking how organizations can collect more information, infrastructure operators are increasingly ask-

ing how they can transform existing information into better operational decisions and, more importantly, identify risks before they escalate into operational incidents. This is where decision intelligence is emerging as a critical capability.

Unlike traditional monitoring platforms, decision intelligence is designed to connect information across multiple operational domains rather than presenting individual data streams independently. By combining information from satellite imagery, geospatial intelligence, operational sensors, maritime systems, infrastructure monitoring and other data sources, it helps organizations develop a more complete understanding of complex operational environments.

The objective is not simply greater visibility. It is greater understanding that enables organizations to recognize emerging risks earlier, respond proactively and strengthen operational resilience before disruption occurs.

Artificial intelligence plays an important role in enabling this transition. Rather than replacing existing operational systems, AI acts as the intelligence layer that identifies relationships between multiple data sources, highlights emerging risks and provides operators with the context needed to prioritize decisions. By recognizing early indicators of operational change, organizations can move beyond reacting to incidents and instead anticipate them.

For ports, this could mean combining vessel movements, weather data, satellite imagery and operational activity to improve maritime awareness, anticipate congestion or operational bottlenecks and minimize disruption across port operations.

For energy operators, it could involve correlating infrastructure performance, environmental conditions, geospatial information and operational data to identify early indicators of equipment failure or operational risk before they affect service continuity. In both cases, the challenge is fundamentally the same. Operational decisions depend not on the quantity of information available, but on the ability to interpret it within the right context.

This principle underpins TACTICAAI's approach to decision intelligence. By combining Earth Observation, geospatial intelligence, operational data, multi-sensor fusion and AI-powered reasoning, the platform is designed to provide operators with a common operational picture that supports faster, more informed decision-making. Rather than functioning as another monitoring platform, it enables organizations to connect fragmented information, understand developing situations and coordinate action across complex operational environments while helping anticipate and mitigate operational risks.

Importantly, this approach does not replace human

expertise.

Operators remain central to every operational decision. AI supports that expertise by reducing cognitive workload, identifying relationships that may otherwise go unnoticed and presenting information in a way that enables faster interpretation. Human judgement continues to determine priorities, assess risk and make final decisions.

As critical infrastructure continues to become more interconnected, the organizations that perform most effectively will not necessarily be those with access to the largest number of sensors or the greatest volume of operational data.

Their advantage will come from recognizing emerging risks sooner, responding before disruption occurs and building more resilient infrastructure capable of adapting to increasingly complex operational environments.

The future of critical infrastructure will not be defined by the volume of operational data organizations collect, but by how effectively they transform that data into decision intelligence, connecting information across domains, providing context for human operators and enabling organizations to anticipate risk, strengthen resilience and make better decisions.



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A contract equipping US dredgers and support vessels with secure IT infrastructure has demonstrated the value of high-end network solutions – even as the maritime sector plays catch-up with modern cybersecurity realities.

Today's 'connected ship' has access to more advanced technology and greater bandwidth than ever before. However, while these solutions have the capability to boost situational awareness and enhance ship-to-shore communications, the more systems installed on board, the tougher they are to manage.

"Building a secure network from day one takes a lot of work, but we're seeing smaller operators cut corners – they're just not doing it right," warns Nathaniel Kemberling, President and CEO of BroCoTec, a Houston-based start-up delivering specialised IT and cybersecurity infrastructure services. "Cybersecurity can't be an afterthought; it must be baked into the foundational framework from the ground up."

In Kemberling's opinion, the maritime sector lags behind the more robust cybersecurity frameworks found in the energy, industrial and aerospace sectors. While this view typically sparks debate over whether maritime

is inherently conservative and resistant to technological change, he argues that the real issue is more nuanced: operational practices have not kept up with the rapid spread of technology and the evolution of modern threats.

"Vessels operate similarly to industrial manufacturing facilities, using both operational technology [OT] to control critical mechanical systems and information technology [IT] for general network services," Kemberling explains. "Because ship operators are rarely network security experts, they traditionally lump these systems together into flat, unsegmented networks simply to get them working."

"This creates major vulnerabilities: for example, exposing engine telemetry feeds to the internet, where a breach on the IT side can directly compromise physical ship operations. Resolving this requires implementing proper network segmentation, firewall isolation and logical security controls to protect critical OT environments from external threats."

The Starlink Conundrum

Kemberling formed BroCoTec in 2019 to deliver enterprise-grade IT infrastructure and cybersecurity to small- and medium-sized businesses. The company's remit covers everything from sensors to camera system: "if it sits on the network, we'll support it," he says. BroCoTec is also keen to source top-tier tech talent, including a recent hire who previously managed networks aboard the International Space Station.

Drawing on his background as CTO at Cloud services provider Brinkster, where he supported "literally thousands of servers", Kemberling notes the stark contrast with maritime clients who consider 30 servers a high number. "We come from different worlds," he muses.

There is simply too much data for skeleton IT departments to manage nowadays, he elaborates. "The changing landscape of security tools keeps growing exponentially, and it's difficult for the one-man and two-man IT departments to keep up," Kemberling says. "Maritime has always trailed other industries in cybersecurity, but that gap was manageable before the arrival of cheap global satellite internet, courtesy of networks like Starlink." While large-enterprise fleets can afford first-rate IT coverage, smaller operators – "think those running a 30-boat fleet, with a small-business mentality", Kemberling suggests – typically equip their vessels for online connectivity without the set-up to secure them.

"Downtime is far more expensive than the cost of the technology, but some operators still hit the 'cheap button' without acknowledging the risk," he says. "Starlink brought cheap internet to almost every vessel, allowing crews to stream TV and plug devices

directly into the ship's network, which leaves the OT exposed. Many of these systems run on 15-year-old PLCs that have not been updated and carry major vulnerabilities. Cheap internet connected everything - and now hack-

ers can reach it all."

Owners and operators, particularly those in the U.S., must catch up in recognizing and responding to these threats, Kemberling advises. He points to the US Coast Guard's new

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“Building a secure network from day one takes a lot of work, but we’re seeing smaller operators cut corners – they’re just not doing it right. Cybersecurity can’t be an afterthought; it must be baked into the foundational framework from the ground up.”

– Nathaniel Kemberling, President & CEO, BroCoTec

regulation 33 CFR Part 101, Subpart F, which mandates strict network segmentation to separate business IT, such as corporate emails and off-watch crew communications, from critical OT, including steering and propulsion. With enforcement set for July 2027, Kemberling warns: “Because many operators don’t understand the requirements and are delaying compliance, the maritime sector could face a major bottleneck before July rolls around.”

Dredgers Connected

Shortly after the company’s formation, BroCoTec secured its first maritime client. Mid-sized marine infrastructure firm Encore Dredging Partners operates cutter suction dredgers (CSDs) across Central US river systems and the Gulf Coast, delivering channel maintenance, coastal restoration and survey operations, primarily for the US Army Corps of Engineers (USACE).

“We monitor 100% of Encore’s fleet IT,” says Kemberling. “We built a classic office experience aboard the vessels, complete with Teams, SharePoint and IP phones, while maintaining secure IT/OT network separation.” Crew members now enjoy full WiFi, cellular-over-WiFi calling and dedicated guest networks for personal use. This connectivity extends from the operator’s main cutter suction dredges (CSDs) to supporting workboats, crewboats and barges, and even to remote pump stations located miles from the vessels’ routes. “We provide a 24/7 support help desk and rapid emergency dispatch to manage onsite repairs and replacements for major disruption,” Kemberling says.

Encore Dredging Partners confirms: “Integrating high-speed network infrastructure, 1080p HD live-feed camera arrays and centralised operational dashboards...provides real-time visibility into vessel metrics, environmental data and equipment performance. These connected sys-

tems streamline dredge positioning and safety compliance while delivering measurable gains: reduced downtime, optimised fuel efficiency, better crew coordination and fewer safety incidents.” Kemberling adds: “Continuous monitoring helps us maintain Occupational Safety and Health Administration [OSHA] and USACE safety standards, ensuring every operation is documented and traceable.”

Retaining Expertise

The cost benefits are significant. “For clients like Encore, the cost of technology is negligible compared to the expense of a CSD going down,” says Kemberling. “Using AI analytics, Encore can predict component failures like bearing issues long before they cause costly downtime.”

Another interesting benefit of the enhanced network has become apparent, he notes: “These tools allow industry veterans nearing retirement to monitor operations and view operator screens from home, keeping decades of institutional knowledge active.” Additionally, authorised Encore employees can stream live OT data, like that related to gauges, pressures and loads, directly to the internet, allowing managers to remotely monitor progress and equipment status from their personal devices, and from most global locations.

BroCoTec now plans to extend beyond its current US waterways footprint, with upcoming projects including full network and Wi-Fi infrastructure deployment aboard a 600-berth mini-cruise ship – which, Kemberling says, will present “unique signal challenges” due to the vessel’s steel superstructure. However, these are challenges that must be overcome if BroCoTec is to convince the maritime sector that resilient cybersecurity and always-on connectivity are entirely possible –provided that operators also learn to ‘think big’.

THE NEW RULES OF MARITIME RISK MANAGEMENT

By Jason P. Waguespack and Fraser K. Mitchell

As the conflict between the United States and Iran continues its seemingly never-ending dance between smolder and blaze, the prolonged closure of the Strait of Hormuz has captured the attention of maritime businesses seeking relief from the current turmoil and insight into the next geopolitical upheaval. Assuming current trends continue, international relations also appear to be moving toward more protectionist, nation-focused trade policies and away from the previous paradigm of globalism. Maritime businesses and insurers should familiarize themselves with the world's major chokepoints and prepare for potential disruptions or blockages.

The U.S. Energy Information Administration defines maritime chokepoints as "narrow channels along widely used global sea routes." The Strait of Hormuz, a narrow passage between Iran and the Omani Musandam Peninsula, has caused considerable and intractable economic hardship because it is among a small group of major chokepoints with no practical alternative route.

The second Trump administration has taken steps to reestablish U.S. influence over the Panama Canal, North America's infamous manmade chokepoint. Questions have also emerged about the stability of the Strait of Gibraltar, the passage separating Spain and Morocco that connects the Atlantic Ocean and the Mediterranean Sea. In Southeast Asia, the Straits of Malacca and Taiwan have come under

increasing tension as the U.S., China, India, and other powers compete in industries such as semiconductors, artificial intelligence, petrochemicals, natural gas, and automobiles.

Maritime chokepoints vary in their capacity to disrupt maritime trade. A blockage of the Strait of Malacca, similar to the disruption affecting the Strait of Hormuz, would have serious economic consequences. However, vessels could still reach their destinations by taking a longer route around the corridor separating Malaysia and northern Indonesia. Such a disruption would increase freight costs, voyage times, and exposure to other perils at sea.

Determining which aspects of marine operations depend on a maritime chokepoint allows businesses to assess operational and logistical risks proactively. Planning for bottleneck disruptions requires evaluating a business's sensitivity to delays and the extent to which its operations and growth depend on an uninterrupted chokepoint. Because maritime chokepoints are not a new phenomenon, risk management should center on proactive planning rather than reactive measures.

National and International Sanctions

The current international trade environment illustrates the need for maritime businesses to monitor relevant sanctions and implement effective compliance and risk-management procedures.

(Continued on page 28)

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All image courtesy Military Sealift Command

MSC'S MARINER MATH

REBUILDING THE WORKFORCE BEHIND THE FLEET

*The U.S. Navy's Military Sealift Command is a critical part of the United States' national security equation, as any navy only goes as far as its supply chain allows. **RADM Benjamin Nicholson, Commander, U.S. Navy Military Sealift Command**, visited with **Maritime Matters: The MarineLink Podcast**, for a deep discussion on MSC, including changes in mariner pay and benefits that will enable it to attract and retain the seafarers it wants and needs.*

By Greg Trauthwein

Military Sealift Command occupies an unusual position in the U.S. Navy enterprise. Its ships rarely generate the attention afforded an aircraft carrier, destroyer or submarine, but the Navy's ability to operate globally depends on MSC getting fuel, ammunition, food, equipment and spare parts where they need to go. For **Rear Admiral Benjamin Nicholson, Commander, Military Sealift Command**, keeping the MSC logistics machine running starts not with ships, but with mariners. "You can have all of the things in the world, but if you don't have the people to make the things operate, nothing works," Nicholson said. "So my number one prior-

ity is our mariners, specifically the civil service mariners."

That priority comes after several difficult years for MSC, when personnel shortages became serious enough that the command removed ships from operation to concentrate available CIVMARs aboard the remaining active fleet.

Today, Nicholson sees signs that the personnel picture is moving in the right direction. MSC has grown from roughly 5,500 CIVMARs when its "force generation risk reduction" effort began to more than 6,200 today. While attrition has fallen from approximately 15% to 7%, Nicholson's target is growth: to approximately 9,300 CIVMARs, or another 3,000 people. That number, he stress-

RADM BENJAMIN NICHOLSON, COMMANDER

*“You can have all of the things in the world, but if you don’t have the people to make the things operate, nothing works. **My number one priority is our mariners, specifically the civil service mariners.**”*

**– RADM Benjamin Nicholson,
Commander, U.S. Navy Military
Sealift Command**



es, is not simply about filling billets. It is about building enough depth into the workforce so mariners can rotate off ships on schedule, take leave, attend training and deal with inevitable medical and personal issues without creating another personnel problem somewhere else in the fleet.

For a U.S. maritime industry wrestling broadly with a shortage of qualified mariners, that makes MSC’s recruitment and retention effort worth watching. The command is attacking the problem from several directions, including significantly higher entry-level compensation, removal of longstanding pay constraints, paid training, new recruiting pipelines and improvements in shipboard quality of life.

\$188,000+

For a newly licensed graduate from one of the maritime academies, Nicholson said the average first-year salary for a third mate or third officer at MSC is now more than \$188,000, accompanied by a signing bonus approaching \$58,000.

Engineering graduates can earn even more. “If you have a third engineer’s license, average starting salary at MSC is almost \$209,000 with almost a \$76,000 signing bonus,” Nicholson said. “Enormous numbers. I mean, there’s no other school in the country that you can take someone that just graduates out and really make that kind of money, and it just goes up from there the longer you stay with us.”

But recruiting young officers is only part of the equation.

MSC is targeting the state and federal maritime academies for licensed mariners, while expanding its search for unlicensed personnel. Nicholson points to 88 maritime high schools around the country as a pool of young people

who have already demonstrated an interest in the industry. MSC is also reaching into high schools with strong STEM and mechanical programs and attending the National Convention of High School Counselors to put maritime careers in front of students who might otherwise never consider going to sea. Another initiative, dubbed “Mil to MSC,” targets service members leaving the military. The objective is to make it easier to translate Navy shipboard experience into USCG merchant mariner credentials.

Under the program Nicholson described, candidates could enter MSC in a paid training position rather than automatically starting at the bottom. MSC would then help translate their military records into Coast Guard requirements, identify missing qualifications and provide the necessary training.

Removing the Pay Cap

Perhaps no personnel change has been as immediately consequential as the modification of MSC’s CIVMAR pay caps.

“The pay cap removals were huge to us,” Nicholson said. “We saw almost instantly a change in the workforce.”

The old system created an obvious competitive problem. Senior MSC mariners could earn compensation comparable to commercial mariners across the pier, but they could not necessarily take all of that money home. For masters and chief engineers, compensation exceeding the federal cap accumulated in a non-interest-bearing account that could not be accessed until retirement. “You’re asking someone to work for you, but they’re not bringing home the same amount of money that the person across the pier is doing,” Nicholson said. “That’s a problem.” The base salary cap



All image courtesy Military Sealift Command



technically remains, Nicholson said, but it has been raised sufficiently that it is above MSC's current pay levels. More importantly, the separate aggregate pay cap affecting overtime earnings has been eliminated. MSC was also able to return money previously withheld under the old limits.

"For some of our folks, it was like lottery winning payouts," Nicholson said. "It really made a big difference in the workforce."

Taking Ships Offline

The workforce problem had reached the point where MSC leadership made the difficult decision to take ships out of service. Nicholson uses a football analogy to explain it. MSC, he said, is not the flashy player making magazine covers, but it is the player a team has difficulty winning without. For years, that player was hurt and kept playing hurt. Eventually, something had to give. "Our can-do attitude was killing us because we kept saying we could do stuff and we just really didn't have the people to do it properly," Nicholson said. Initially, 17 ships were taken offline. Doing so allowed MSC to move mariners onto operational ships, bring crewing closer to required levels and improve rotations. At the time of the interview, 15 ships remained offline, with Nicholson expecting a couple more to return in the following month or two as workforce numbers increased. His long-term objective is straightforward: enough mariners to fully crew the fleet regardless of whether ships are operating or undergoing maintenance, while still allowing personnel to take leave and receive training.

Recruiting & Retaining

Money matters, but Nicholson readily acknowledges that MSC has to compete with commercial shipping on the complete employment package. One gap was connectivity.

"The commercial industry for quite some time has had full-blown internet at sea and we didn't," Nicholson said.

MSC responded with **CIVMAR Wireless Internet Network (WIN)**. At the time of the interview, the system had

been installed aboard 26 government-owned, government-operated ships, with another installation underway. New ships will receive the capability during construction, and MSC is deploying temporary kits to ships operating in areas where permanent systems have not yet been installed. "That's a super important thing, having that connection with people," Nicholson said, and is an acknowledgement of how much life at sea has changed. "There was a day where a ship would pull into port and all of the sailors, they were looking for the closest bar," Nicholson said. "Now we pull into port, the sailors are looking for the closest Wi-Fi."

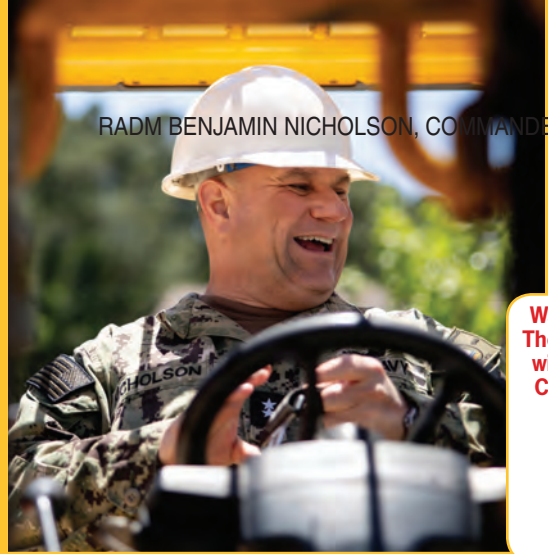
Connectivity means video calls home, but it also means handling the routine parts of modern life, from paying bills to following news while deployed. Training represents another competitive tool. MSC pays for technical training, and Nicholson wants a workforce large enough that mariners can take leave and then attend required schools without having that training charged against their leave.

The opportunity extends to career advancement. MSC has mariners serving as masters who began as ordinary seamen, with the command paying for training throughout their progression. An AB-to-mate program allows selected able seamen to attend school and return with a third mate's license, and MSC is working toward a similar engineering pathway. Student loan repayment is another recruitment and retention tool.

Nicholson is also expanding leadership training beyond technical competence. "I want masters and chief engineers that our people want to work for," he said. MSC has begun week-long programs for senior CIVMARs emphasizing the "softer skills" of managing and leading people. Nicholson's goal is eventually to create a leadership training continuum accompanying advancement through the organization.

An Aging Fleet

The people problem cannot be separated from the hardware. MSC operates 62 government-owned, government-operated vessels crewed by CIVMARs and another 43



Watch the full **Maritime Matters:**
The MarineLink Podcast interview
with RADM Benjamin Nicholson,
Commander, U.S. Navy Military
Sealift Command here:



government-owned, contract-operated vessels crewed by approximately 1,500 contract mariners. Add an average of roughly 61 chartered vessels, a figure that fluctuates with requirements, and Nicholson puts MSC's total fleet under its purview at approximately 166 ships.

Government-owned ships are typically operational about 60% of the time, Nicholson said, with roughly 40% of their time involving maintenance in some form. "That becomes more difficult as the ships start to get older," he said. "You need a little bit more maintenance, a little more love and care to keep those ships going." Age is increasingly part of MSC's fleet equation.

Nicholson puts fleet replenishment oilers high on his recapitalization list, particularly accelerating introduction of the new 205-class ships to replace the aging 187-class oilers.

In commercial shipping, Nicholson notes, recapitalization commonly occurs around 20 to 25 years. Some of MSC's 187-class oilers could reach 40, 46 or even 48 years before retirement. "That is a lot of strain on a ship to do that," Nicholson said, particularly given the physical demands of underway replenishment.

The Lewis and Clark-class dry cargo ships are themselves approaching the 20-year mark, while MSC's hospital ships and submarine tenders present additional aging-fleet challenges. Nicholson believes the answer should involve more than simply replacing old ships one class at a time.

He advocates greater commonality across future MSC vessels. Hospital ships, submarine tenders and other platforms perform very different missions, but that does not necessarily mean their basic machinery and systems must be entirely different. "They could have common engineering plants, common propulsion systems, common ship control systems," Nicholson said. The mission-specific portions could change while the basic platform remains substantially common. That could lower lifecycle costs through common training and spare parts while giving shipyards the benefit of repetition. "The more we can have commonality between vessels, I believe the faster we can have ships coming out," he said.

Nicholson also sees MSC's chartering practices as potentially important to broader U.S. commercial fleet renewal. Longer-term charter commitments, he suggested, could provide operators with the demand signal needed to secure financing for new vessels rather than requiring the government to own every ship itself.

People Make the Logistics Chain Work

MSC's fleet ultimately exists for one reason: to keep the Navy supplied. Nicholson describes the Navy-Marine Corps team as "America's away team," capable of operating far from home without depending entirely on nearby bases because MSC provides the continuing flow of fuel, ammunition, food and repair parts.

That makes ships essential. It makes maintenance essential. It makes shipbuilding essential. But it circles back to Nicholson's first priority: people. The command has already learned what happens when the mariner equation does not balance. Ships had to be removed from operation because there were not enough people to sustain the fleet properly. Today, the numbers are improving, compensation is more competitive and overdue relief has been sharply reduced, but the journey from roughly 6,200 CIVMARs to Nicholson's target of 9,300 remains substantial.

For young mariners weighing career choices, MSC is making a clearer pitch than it has in the past: competitive six-figure earnings, large signing bonuses for licensed officers, paid education and training, a path from the hawsepipe to the wheelhouse, improved connectivity and the opportunity to do work unlike most commercial shipping.

As Nicholson put it, an MSC mariner is not simply carrying cargo between two ports. Much of the job happens between those ports, conducting underway replenishment and supporting naval operations at sea.

"It's when they're doing those underway replenishments, it's when we're doing those things that no one else can do like we can do," Nicholson said. "And that is so super exciting. It's a lot of adventure."



Image credit: Kitanihon Shipbuilding

RESILIENT LINK IN THE COLD CHAIN

**Ongoing fleet renewal by niche player
Cool Carriers indicates continuing
competitiveness at scale of the specialized,
pallet-optimized reefership.**

By David Tinsley

Image above: Snow Flower, first of seven reeferships booked by Japanese interests from Kitanihon Shipbuilding for deployment by Cool Carriers.



REEFERSHIPS

Snow Flake, second in the Kitanihon series engaged by Cool Carriers. The program reinforces longstanding relationships with the Japanese business community.

Image credit: Cool Carriers

Not so long ago, it seemed that the unrelenting march of containerization and ever-widening influence of the powerful ocean container line entities would finally usurp the conventional, breakbulk refrigerated cargo vessel. However, Limassol, Cyprus-headquartered Cool Carriers, the largest operator in the sector, displays remarkable resilience through consecutive programs of tonnage development.

Hard on the heels of a period of renewal centred on five ships in the 900,000ft³ category, the highest-capacity breakbulk reefers ever commissioned, the company has this year received the first two of seven confirmed newbuilds in the 630,000-670,000ft³ range. Moreover, a further batch of vessels is understood to be in the offing.

Cool Carriers is a practitioner of the service principle known as fast, direct and dedicated (FDD). This is an alternative and a challenge to routings via services run by the large ocean container lines, where overall transit times and overall costs can be higher for refrigerated consignments. FDD is attuned to the particular time and handling sensitivities of fresh produce transportation and niche trades. By using specialized vessels on a direct voyage basis between ports with dedicated infrastructure, it offers shorter delivery times and reduced handling, obviating transshipment, and bestows seasonal flexibility as to shipment volumes.

As well as operating more than 50 reefer vessels, Cool Carriers has strengthened logistic capabilities by investing in cold storage facilities, as in Ecuador.

The last of five record-breaking, E-class behemoths came from Shikoku Dockyard at Takamatsu in 2025. The follow-on, current stage in the expansion of the Cool Carriers-deployed fleet has been entrusted to Kitanihon Shipbuilding, located at Hachinohe in northernmost Honshu, affording further testament to Japan's sustained prowess in the design and production of dedicated refrigerated cargo vessels. The program there entails the aforesaid seven vessels, the first of which was handed over in March this year as the 13,287gt Snow Flower, followed in June by sister-ship Snow Flake.

Snow Flower and Snow Flake each embody a temperature-controlled cargo capacity of 637,700ft³, capable of stowing some 5,000 high-cube pallets of fruit. The subsequent five newbuilds will be somewhat larger, at around 670,000ft³, with one further delivery due before the end of 2026, and the remainder of the series expected through the course of 2027 and 2028.

Main hull dimensions are 158 metres length overall by 25 metres breadth, with a design draft of nearly nine metres, or about 10 metres on summer marks. While customized to owner and charterer requirements, the Snow Flower type is based on the 630,000ft³ design template previously used by Kitanihon in four newbuilds completed during 2024 and 2025 and introduced by French producer Compagnie Frutiere to services maintained by its UK logistics subsidiary Africa Express Line (AEL).

Snow Flower and Snow Flake—adopting Salen nomen-

SECTOR IN FOCUS

Image credit: Cool Carriers



Record-breaking, specialized reefership capacity: Cool Elegance,
last of five E-class vessels built by Shikoku Dockyard.

clature of the 1970s—are each arranged with four holds subdivided by tweendecks to form 15 cargo compartments, wherein temperatures can be regulated between plus 15degC and minus 25degC. Added flexibility and volume is provided by 150 electrical sockets ('plugs') for reefer containers on the upper deck.

A key feature of the design, as was the case with the preceding Cool Express E-series, is the 2.5-metre clearance available in all under-deck spaces, compared with 2.2 metres hitherto. The increase gives space for extra tiers of cartons on high-cube pallets, raising efficiency and competitiveness by matching the internal height of 2.5-metre high-cube reefer boxes.

Self-reliance in cargo handling has traditionally been a characteristic of the reefer cargo ship, and the requisite wherewithal in each of the latest vessels is in the shape of four luffing-type deck cranes, fitted along the centreline to plumb the entire underdeck cargo spaces and above-deck container slots. The foremost (No1) and aftermost (No4) units have dual-mode capability, for 8-tonne pallet loads or for 40-tonne laden container movements throughout the length of the cargo section, whereas the two central cranes (Nos2/3) are rated for 8-tonne lifts.

The wooden gratings at the tweendeck and tanktop levels in the holds have the strength to bear the imposed loads from forklifts moving palletised freight between hook and point of stow.

Each multi-tweendeck/multi-compartment hold is divided into two cooling sections. This enables different cargoes to be carried in each, such as bananas at a precise, constantly maintained plus 13.3degC and apples at plus 1degC, for example.

It has long been the practice in the reefership sector to use available space for auto shipments when the ship is running light, as on a return voyage. Such capability is retained in the Snow Flower type, and amounts to a 526-vehicle capacity.

Main propulsion is by a single, 500 mm-bore 2-stroke of 9,860 kW output manufactured by Japan Engine Corporation (JEC), proprietor of the former Mitsubishi UE range. Laden to a design draft of nearly nine metres, and given fair conditions, the ship can make 18 knots-plus, on a daily burn of 35.2 tonnes of very low sulphur fuel oil (VLSFO), or some 37 tonnes of heavy fuel oil (HFO) with the open-loop SOx scrubber activated.

The heavy electrical load borne by such vessels is implicit in a five-genset plant sized at 6,620 kVA in total. Fuel consumption by the auxiliaries during a laden voyage can accordingly be substantial. For instance, maintaining the correct environment for a full banana cargo can entail a daily usage of nine tonnes of VLSFO, rising to more than 13 tonnes where there is a deck load of up to 130 reefer containers.

Japanese beneficial owners are heavily involved in the evolution of the Cool Carriers fleet. Snow Flower and Snow Flake are owned by Nissen Kaiun, under Singapore registry with the Singaporean arm of the Japanese group. One of Japan's largest private, family-controlled owners of various types of tonnage, Nissen Kaiun's business model is to order newbuilds primarily from compatriot shipbuilders for long-term charter or lease to established operators.

The previous stage of Cool Carriers' fleet renewal, entailing the E-class behemoths of nearly 905,000ft³, began with the 2018 handover by Shikoku Dockyard of the

Cool Express, also beneficially owned by Nissen Kaiun. She was followed a year later by Cool Explorer and subsequently by Cool Eagle in 2021. The final pair, Cool Emerald and Cool Elegance, were brought into commission during 2025.

The Cool Express quintet is widely regarded as the state-of-the-art embodiment of the classical reefer vessel, maximizing operational efficiency, load volume, and trading agility. The design brings record scale to the concept and practice of delivering fast, direct service to shippers of perishable produce, ensuring precise cargo condition control throughout the long sea link in the 'cold chain'.

Laid out with five holds divided by tweendecks to create 18 cargo compartments, the 180-metre Cool Express class melds a multi-deck capability for transportation of palletized goods requiring in-transit temperatures down to minus 30degC, with the added versatility afforded by slots for 607 TEU or 400 FEU containers, including up to 342 refrigerated units of 40ft. Weatherdeck-borne containers are securely cradled within a lattice of lashing bridges.

The unique volume of the breed is such that each ship can load around 14,000 high-cube pallets—8,000 in the holds, and 6,000 in containers on deck.

Approximately 800 autos can be shipped on back hauls or ballast legs, and self-reliance at loading points and in port operations generally is conferred by five 40-tonne deck cranes.

Cool Carriers' legacy embraces a number of the foremost names associated with reefer shipping in past years. It provides the underbed of experience and tradition that continues to move the company forward, with resilience and pragmatism also expressed in to-

day's modus operandi whereby fleet development is nurtured through business relationships involving Japanese shipowners and investors.

Cool Carriers has Swedish roots, being the 1984 encapsulation of the Salen organization's longstanding reefer ship interests. The company has since been central to various stages of industry consolidation, first through a merger with the reefer division of Denmark's Lauritzen Group, and subsequently through NYK Group's

introduction of its entire reefer fleet. Thus came into being NYKLauritzen-Cool, presaging a period which saw the Japanese major as part owner and then full owner.

Lauritzen pulled out of the reefer sector in 2007, resulting in the name change of the follow-on entity as NYKCool. Seven years later, NYK also decided to quit the pure reefer-ship segment, whereupon the surviving company reverted to its former name, Cool Carriers.

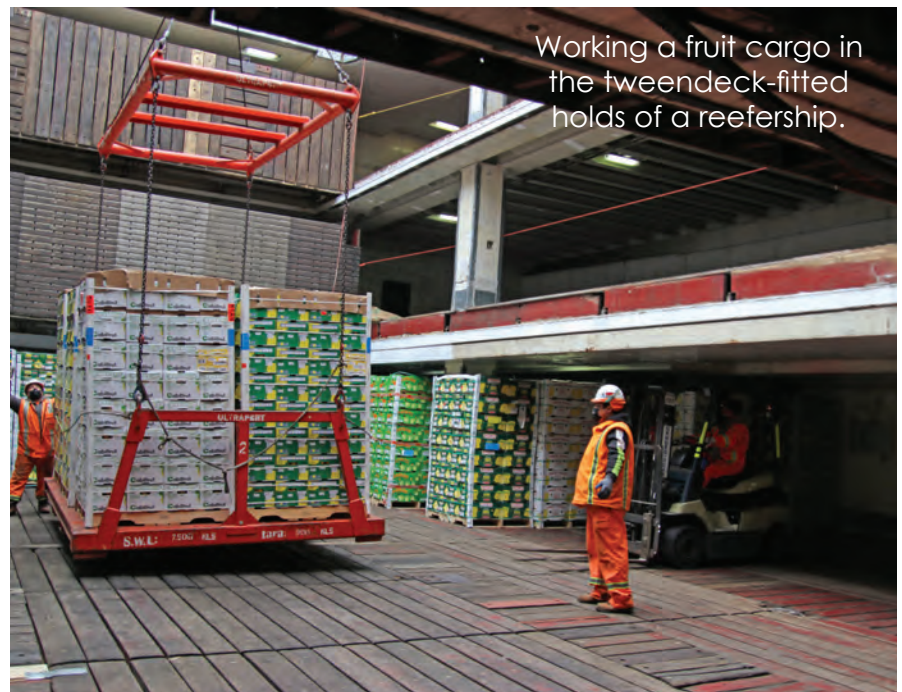


Image credit: Cool Carriers

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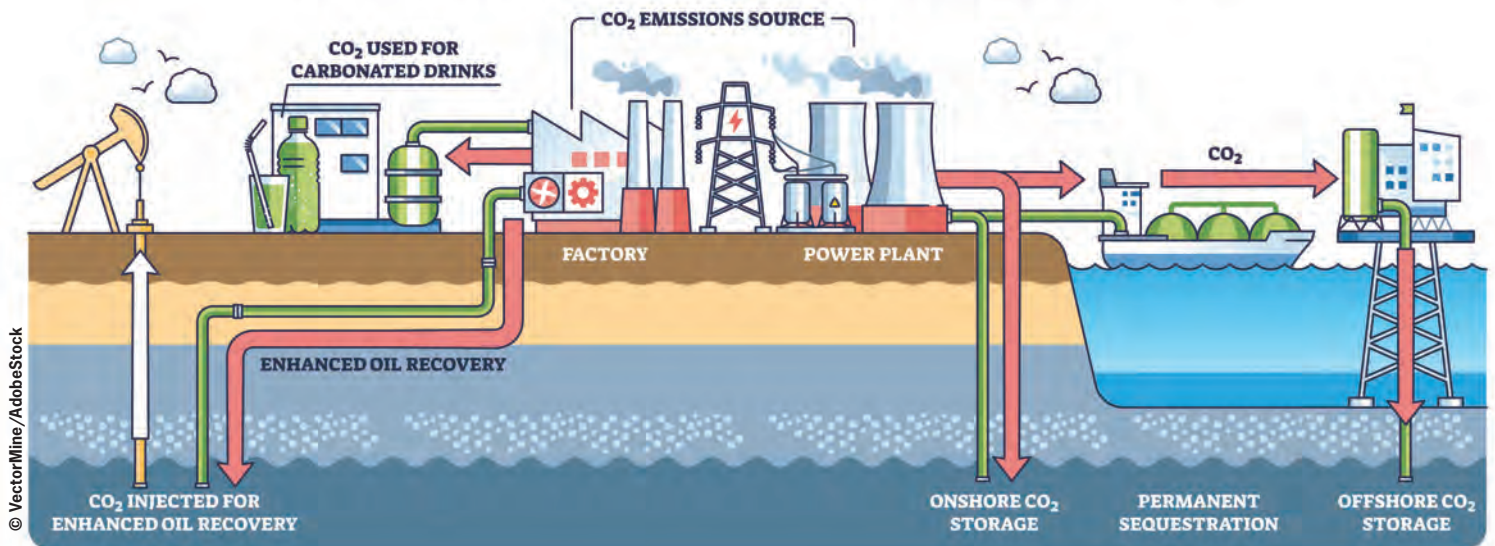
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THE BUSINESS OF OFFSHORE CO₂ STORAGE:

A NEW MARKET FOR MARITIME INFRASTRUCTURE

CARBON CAPTURE UTILIZATION AND STORAGE



By Alisa Reiner, Offshore energy markets analyst, Intelatus Global Partners; Master of Environmental Management, Yale University.

Carbon capture and storage (CCS) is moving from a collection of demonstration projects toward a new infrastructure business. As of July 2025, 734 commercial CCS facilities were in operation or development, up from 628 a year earlier, while total capture capacity in the pipeline increased from 416 million tons per annum (Mtpa) to 513 Mtpa (64 Mtpa operational) (Figure 1).

The number of operating facilities rose from 50 to 77 between 2024 and 2025, while 657 facilities were in different development stages in 2025 (Figure 2).

Commercially, this matters because more projects are moving from studies toward physical assets, contracted services, and long-duration operations.

Growth Is Shifting Toward Offshore-Capable Regions

An independent Intelatus Global Partners review identifies eight operating facilities and seven facilities under construction involving offshore CO₂ injection for geological

storage or enhanced oil recovery (EOR), as of 2025.

Europe is emerging as a leading market for shared networks and offshore storage development – its dedicated CO₂ transport-and-storage projects doubled between 2023 and 2024. To the East, in Asia, CNOOC commissioned China's first offshore CCUS project at the Enping 15-1 oilfield in 2025. The project is expected to inject more than 1 Mt of CO₂ over the following decade for EOR while increasing crude-oil production by around 200,000 tons. To the West, in the Americas, Petrobras' Santos Basin pre-salt project provides an established offshore precedent, reinjecting 14.2 Mt of CO₂ into the basin's pre-salt reservoirs in 2024, capturing EOR-associated CO₂.

Together, these developments show a strong fit between CCS growth and the existing offshore energy ecosystem. But for maritime and offshore companies, the opportunity lies less in capture equipment than in what happens after capture.

Depending on the transport mode, CO₂ must be dehydrated and compressed for dense-phase pipeline transport, or liquefied, refrigerated, and stored for marine transport. It then requires receiving, injection, monitoring, and long-term stewardship arrangements. As storage shifts offshore, ships, ports, pipelines, wells, platforms, and subsea systems connect industrial emitters with the reservoir, creating a new offshore value chain and potentially a new commodity flow.

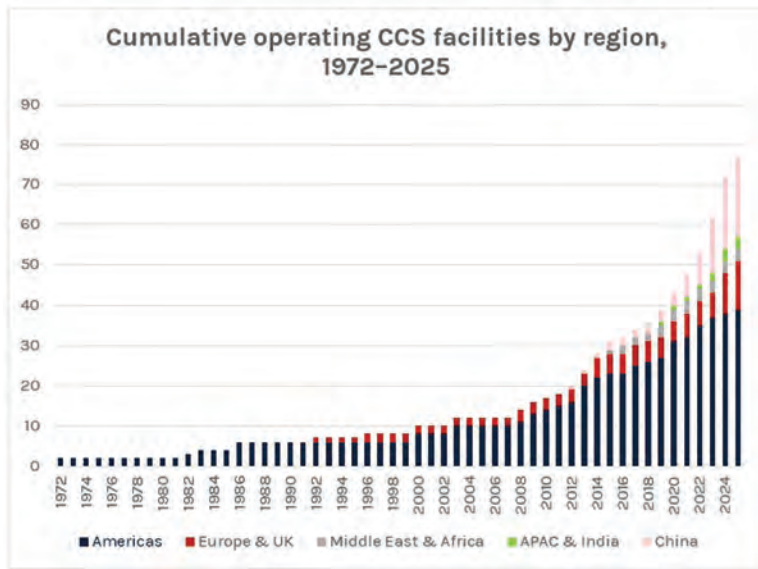


Figure 1.
Cumulative operating CCS facilities by region, 1972-2025

Source: Intelatus Global Partners' interpretation of Global CCS Institute data.

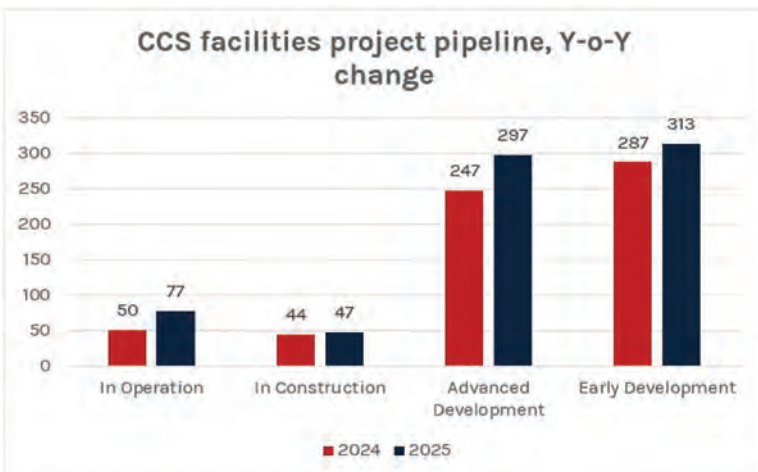


Figure 2.
CCS facilities project pipeline, year-on-year change, 2024-2025

Source: Intelatus Global Partners' interpretation of Global CCS Institute data.

Offshore Storage Models Are Diversifying

Storage geology shapes the business model. Depleted oil and gas reservoirs benefit from existing subsurface data on pressure, porosity, and permeability and may allow wells or pipelines to be reused. Saline formations offer larger potential resources but usually require more appraisal and new infrastructure. The former can lower development uncertainty and capital needs; the latter can support larger dedicated storage hubs.

Northern Lights achieved first injection in August 2025, receiving liquefied CO₂ at Øygarden by ship and sending it through a 100-kilometer pipeline into the Aurora reservoir around 2,600 meters below the seabed in the Norwegian North Sea. The project demonstrates a commercial model in which ships deliver CO₂ from multiple industrial customers to a common coastal terminal and offshore storage system.

Greensand Future takes a different route – CO₂ is aggregated at the Port of Esbjerg and shipped to the Nini field in the Danish North Sea. The vessel acts as a virtual pipeline for emitters outside a fixed network. Pipelines concentrate spending upfront in fixed assets, while shipping carries more operating costs through liquefaction, fuel, storage, and cargo handling. That makes ships more flexible as volumes and destinations are evolving, while pipelines are better suited to large, predictable flows.

Eni's Liverpool Bay system repurposes parts of existing offshore infrastructure and depleted gas reservoirs around 30 kilometers offshore. For mature basins, CCS can therefore extend the economic role of reservoirs, wells, and pipelines after hydrocarbon production declines.

In the Northern Endurance Partnership project, CO₂ from Teesside and the Humber industrial cluster will move through two offshore pipelines to the Endurance saline aquifer, where all installed infrastructure will be subsea, including manifolds, flowlines, and six injection wells.

Porthos has advanced construction of its onshore and offshore transport system and well-conversion program, but in April 2026 pushed start-up to no earlier than the second half of 2027. This demonstrates that while reuse reduces greenfield requirements, it does not remove integration risk.

Kasawari in Malaysia provides yet another model – CCS integrated directly with offshore gas production. PETRONAS plans to capture CO₂ from the high-CO₂ Kasawari gas field offshore Sarawak and reinject around 76 Mt over the project life.

A New Offshore Commodity

The legal framework is also becoming more workable. The London Protocol, the 1996 IMO treaty governing disposal of wastes and other materials at sea, adopted a 2009 amendment permitting cross-border export of CO₂ for sub-seabed storage; in 2019, parties approved provisional application before formal entry into force. That matters because the best storage sites may lie in a different country from the emissions source.

Transporting CO₂ also requires a different physical chain from conventional bulk shipping. Pipeline systems typically compress CO₂ into a dense phase, while marine transport requires liquefaction and refrigerated storage before loading. That means the maritime opportunity extends

Project	Region	Annual capacity	Offshore model
Northern Lights	Norway	1.5 Mtpa (to at least 5 Mtpa)	Ship-to-terminal, subsea pipeline to offshore saline reservoir
Porthos	Netherlands	2.5 Mtpa	Pipeline, reused offshore platform/wells and depleted gas fields
Greensand Future	Denmark	0.4 Mtpa (potentially 4-8 Mtpa)	Dedicated CO ₂ carrier to offshore platform and depleted oil field
Northern Endurance Partnership	United Kingdom	4.0 Mtpa (potentially 10-23 Mtpa)	Offshore pipelines to saline aquifer; all-subsea injection system
Liverpool Bay CCS	United Kingdom	4.5 Mtpa (potentially 10 Mtpa)	Repurposed offshore gas infrastructure and depleted fields
Kasawari CCS	Malaysia	3.7 Mtpa	Integrated offshore gas-field CCS with storage in a depleted reservoir

Table 1. Selected offshore CO₂ storage developments

Sources: Northern Lights; Porthos; Greensand Future / INEOS; bp / Northern Endurance Partnership; Eni; PETRONAS; IEA.

beyond the vessel itself to compression and liquefaction systems, storage tanks, pumps, loading equipment, and terminal infrastructure.

Ports can therefore become carbon hubs. CO₂ from multiple capture sites can be consolidated at coastal terminals for conditioning, temporary storage, and onward transport. Ports serving refinery, chemical, cement, and power clusters are natural aggregation points.

When Sharing Becomes Good Business

This supports a hub-and-cluster model in which several emitters share transport and storage infrastructure. For lower-volume sources such as individual cement plants, a dedicated pipeline and storage system may be uneconomic – aggregation can therefore expand the addressable CCS market, not merely reduce unit costs.

Maritime industry players should pay attention to the development of terminals aggregating volumes, CO₂ carriers connecting dispersed sources, and storage systems serving multiple customers. Transport and storage can become a standalone infrastructure business based on contracted capacity and long-term service agreements. Northern Lights already follows this model, offering third-party emitters across Europe access to an integrated transport-and-storage network.

Policy Is Creating Storage Demand

The European Union (EU) Net-Zero Industry Act requires developing at least 50 Mtpa of annual CO₂ injection capacity in the EU by 2030. In May 2025, the European Commission identified 44 obligated entities expected to contribute to that target. This shifts the CCS discussion from whether storage capacity should be developed to how quickly it can be permitted, financed, and connected to emitters.

That raises the strategic value of

offshore expertise. Oil and gas companies bring reservoir models, seismic data, well inventories, and operating systems while contractors contribute drilling, subsea engineering, compression, flow assurance, and integrity capabilities. Ports and shipowners connect dispersed capture sites with concentrated offshore storage.

The Main Risk Is the Chain

Porthos illustrates a key CCS risk – all parts of the system must come online together. Delays in pipelines, compression, wells, capture facilities, or permitting can leave completed assets underused and postpone revenues across the whole project. This type of integration risk is familiar across many maritime and offshore projects.

However, unlike oil or LNG, captured CO₂ usually has little or no intrinsic sale value at destination in dedicated-storage chains. Revenues instead come from transport-and-storage fees, carbon-price incentives, regulated support, or the compliance value created for the emitter. CO₂ used for EOR or other applications can generate additional revenue, but this is not the core business model for most dedicated storage hubs.

Storage is also a long-duration service, with obligations extending from site characterization through monitoring, post-injection surveillance, and eventual closure. Because operators recover costs through transport and storage services rather than the sale of a commodity, asset utilization and contracted throughput are critical to project economics. Anchor customers, long-term contracts and shared infrastructure therefore become central to project finance.

The Next Offshore Market

Carbon sequestration is creating a new infrastructure market rather than simply adding another piece of equipment to industrial plants. The value chain reaches from ports and specialized ships to

subsea pipelines, repurposed platforms, injection wells, reservoir management, and decades of monitoring.

Not all CCS spending will move offshore, but the direction is clear – as the market scales, a growing share of the commercial opportunity extends beyond capture into transport and dependable, permitted storage. For maritime and offshore companies, CO₂ is becoming a new cargo, a new subsurface service and a new use for aging infrastructure.

Sources

1. Global CCS Institute
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3. Porthos
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6. European Commission
7. International Maritime Organization (IMO)
8. bp / Northern Endurance Partnership
9. PETRONAS
10. International Energy Agency (IEA)
11. China Daily
12. Petrobras

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WHO WILL DESIGN AMERICA'S NEXT FLEET?

By Morgan Fanberg, Glosten

The United States is having a maritime moment. Maritime is back on the national agenda. The Maritime Action Plan, the SHIPS for America Act, and now the Administration's August 13 memorandum on rebuilding the Navy and America's shipbuilding industrial base have renewed the conversation about rebuilding America's maritime capability. The focus on shipyards, workforce development, the merchant marine, and domestic vessel construction is both encouraging and long overdue.

After more than two decades designing commercial vessels, I'm encouraged by the attention. Engineers don't usually get excited about policy discussions, but this one feels different.

As I follow these discussions, though, I keep coming back to one question: Who will design America's next fleet?

Ships do not begin in shipyards

Ships begin with naval architects, marine engineers, production engineers, and thousands of design decisions made long before the first piece of steel is ordered. Before construction begins, owners, operators, designers, engineers, shipbuilders, equipment manufacturers, classification societies, and regulators must determine what a vessel is expected to accomplish, which technologies suit its mission, how those systems will work together, and how it can be built safely, efficiently, and economically.



One thing I've learned over my career is that successful projects rarely begin with someone saying, "Let's build a ship." They begin with a transportation challenge, an operational problem, or a mission to accomplish. The design process connects those real-world needs to a vessel that can actually be built, operated, and maintained successfully for decades. By the time a vessel reaches the shipyard, many of the decisions affecting safety, operability, maintainability, production efficiency, lifecycle cost, and long-term performance have already been made.

That's why the national conversation should be broader. If America wants to build more ships, it must also preserve and strengthen the ca-

pability to design and engineer them.

The Jones Act requires vessels operating in domestic commerce to be built in the United States, but it says nothing about who designs them. The same gap often exists in publicly funded shipbuilding programs. American taxpayers may fund an American-built vessel while much of the design and engineering work is performed overseas. If the purpose of these investments is to strengthen America's maritime capability, why would we protect the construction work while allowing the resulting design knowledge, intellectual property, and future capability to remain concentrated overseas?

That question becomes especially

important as policymakers consider greater use of mature foreign designs, sometimes described as the “Finland Model.” There are cases where that makes sense. The United States can learn from allied countries that design and build some types of ships more efficiently than we do, and we can take advantage of that expertise.

But learning from our allies and becoming dependent on them are two very different things. A mature foreign design is not automatically a production-ready American design. Are we going to source all the same foreign equipment? Use 50 Hz motors? Keep the same piping and material standards, regulatory requirements, construction methods, and supply chain? Of course not.

The FREMM-based Constellation-class frigate illustrates how extensively a mature foreign parent design may need to be reengineered to satisfy American requirements. Managing those interfaces is naval architecture and marine engineering.

There are good reasons to use foreign parent designs when they are the right answer. But American naval architects and marine engineers should be meaningfully involved so the knowledge, intellectual property, and capability grow here too.

That does not mean every vessel must begin with a clean-sheet American design. It means federally supported shipbuilding programs should include meaningful American design participation, technology transfer, and workforce development. If public investment is intended to rebuild American maritime capability, American engineers should emerge from each program with greater knowledge and experience than they had when it began.

That matters even more as vessels become increasingly sophisticated.

Designing a modern ferry, research vessel, or tugboat isn't simply a matter of selecting an engine and drawing a hull. A single project may combine hybrid propulsion, battery systems, advanced electrical distribution, automation, cybersecurity requirements, emissions regulations, digital controls, and increasingly complex production methods. Each system influences the others. The engineering challenge isn't simply making each one work. It's making all of them work together in a vessel that can be built, operated, maintained, modernized, and relied on for decades.

The maritime industry has never suffered from a shortage of good ideas. The harder part has always been deciding which ones are still good ideas after 20 years of service. Good engineering isn't about adopting every new technology simply because it's new, or chasing whatever technology happens to be receiving the most enthusiasm on LinkedIn. It's about understanding tradeoffs and selecting technologies that genuinely improve the vessel for a particular owner and mission. Sometimes the newest solution is the right one. Sometimes it isn't. Experience helps distinguish between the two.

That kind of engineering judgment isn't something you can manufacture overnight. It develops through mentorship, practical experience, and solving real problems alongside owners, operators, shipbuilders, equipment manufacturers, classification societies, and regulators. The United States has long recognized that shipyards, mariners, and domestic manufacturing contribute to national maritime capability. Design and engineering deserve to be viewed through the same lens. That expertise takes decades to build, cannot be created on demand, and strengthens America's ability to respond to future challenges with con-

fidence and independence.

This isn't a choice between investing in shipyards and investing in engineering. Experienced designers make shipyards stronger, and experienced builders make designers better. Neither can thrive without the other.

The United States is asking important questions about how to rebuild its maritime capability.

How do we expand our shipyards? How do we grow the workforce? How do we build more ships?

Those are exactly the right questions. But rebuilding American shipbuilding also means preserving the expertise needed to translate missions into practical vessel requirements, integrate complex systems, and turn operational needs into vessels that can be relied on for decades.

As America expands its shipbuilding capacity, we should not ask only where its ships will be built. We should also ensure that American naval architects and marine engineers continue to play a central role in designing them, strengthening the expertise that already exists here and passing it to the next generation.

The Author



Fanberg

Morgan Fanberg is CEO & President of Glosten, a U.S. naval architecture and marine engineering firm. A licensed professional engineer based in Seattle, he has spent more than two decades designing commercial vessels and advising owners on complex maritime projects.

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Maritime businesses must keep abreast of the evolving sanction regimes affecting each major global maritime region. In the U.S., the Treasury Department's Office of Foreign Assets Control (OFAC) administers and enforces certain countries, individuals, entities, vessels, and activities. The European Union similarly imposes sanctions involving individuals, vessels, and countries.

Compliance with these multifaceted authorities cannot be relegated to a quick review or checklist item. Because sanctions are issued, modified, and updated rapidly, businesses need procedures that allow them to respond quickly to changes. Given the number of sanctioned individuals, entities, vessels, cargos, and countries, maritime businesses should understand both longstanding restrictions and recent developments. Guidance reviewed even a few weeks before a transaction may no longer be current. This can create exposure for maritime businesses and insurers involved in transactions with newly sanctioned parties, insuring cargoes prohibited at a port of call, or relying on exemptions that no longer apply. Legal and operational teams should therefore work together to conduct sanctions due diligence throughout a transaction.

Exposure Assessment, Analysis, and Adaptation

Maritime Businesses. Maritime businesses face distinct challenges that require dynamic problem-solving and risk-management solutions. Chokepoint disruptions and international sanctions can leave corporate executives, in-house counsel, and insurance directors unsure of the best next step.

There is no one-size-fits-all solution. Each company must assess its operational capacity, strategic alternatives, growth plans, risk tolerance, and ability to absorb higher costs or supply disruptions. Businesses should document these assessments and work closely with their legal departments to evaluate current business projections and develop strategies for potential disruptions.

For chokepoints, the goal is not to maximize resilience against every potential risk, but, as the Boston Consulting Group explains in its report, "Maritime Chokepoints: Five Lessons from the Strait of Hormuz," to strike the "right balance between risk and cost." Maritime businesses should consider how blockages, delays, and transit tolls could affect their ability to operate. Executives should also understand the cost of rerouting vessels and identify viable opportunities to diversify their operations.

Given the uncertainty surrounding the world's major chokepoints, maritime risk management should include:

1. Clearly disclosing relevant chokepoint risks to current and prospective investors, members, partners, and customers;
2. Revisiting standard contract language to address potentially imbalanced terms established before the current economic and political climate;
3. Assessing how a disruption to a particular chokepoint could affect a business's operations and viability.

Insurance Analysis. Marine insurance requires the evaluation of complex and uncertain risks. Insurers must take care not to provide coverage to sanctioned individuals or entities designated under applicable sanctions regimes. Providing insurance to sanctioned party could result in fines, legal penalties, criminal charges, or the blocking of property and future transactions. Insurers must also monitor whether an insured is engaged in conduct or transactions that may run afoul of applicable sanctions.

An insurer's risk-assessment process should bring together its coverage, underwriting, claims, and legal teams to evaluate a particular business or transaction. This coordinated approach can help ensure that the underlying facts, potential coverage, insured entities, and risk factors comply with applicable sanctions regulations. Ongoing assessment of both the insurer's and insured's compliance is essential.

Insurers should also request information about whether a maritime business has considered its ability to operate following a key chokepoint disruption. They should clearly define coverage prerequisites, coverage exclusions, and assess how heavily the business depends on uninterrupted access to a particular route. Reviewing a business's sanctions compliance program and contingency planning can provide a more complete picture of the risks being underwritten.

Maritime chokepoints and sanctions compliance present different challenges that require distinct solutions. Chokepoints are fixed locations with known constraints that may remain manageable until a disruption occurs. Sanctions, by contrast, are constantly changing and require businesses to respond quickly to new rules and restrictions. Sanctions may shift with political developments, but like the ebb and flow of the tides, maritime bottlenecks remain an enduring feature of global trade.

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