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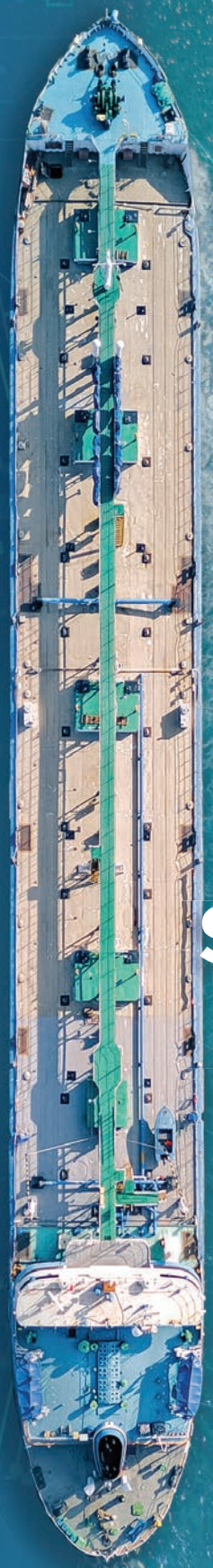

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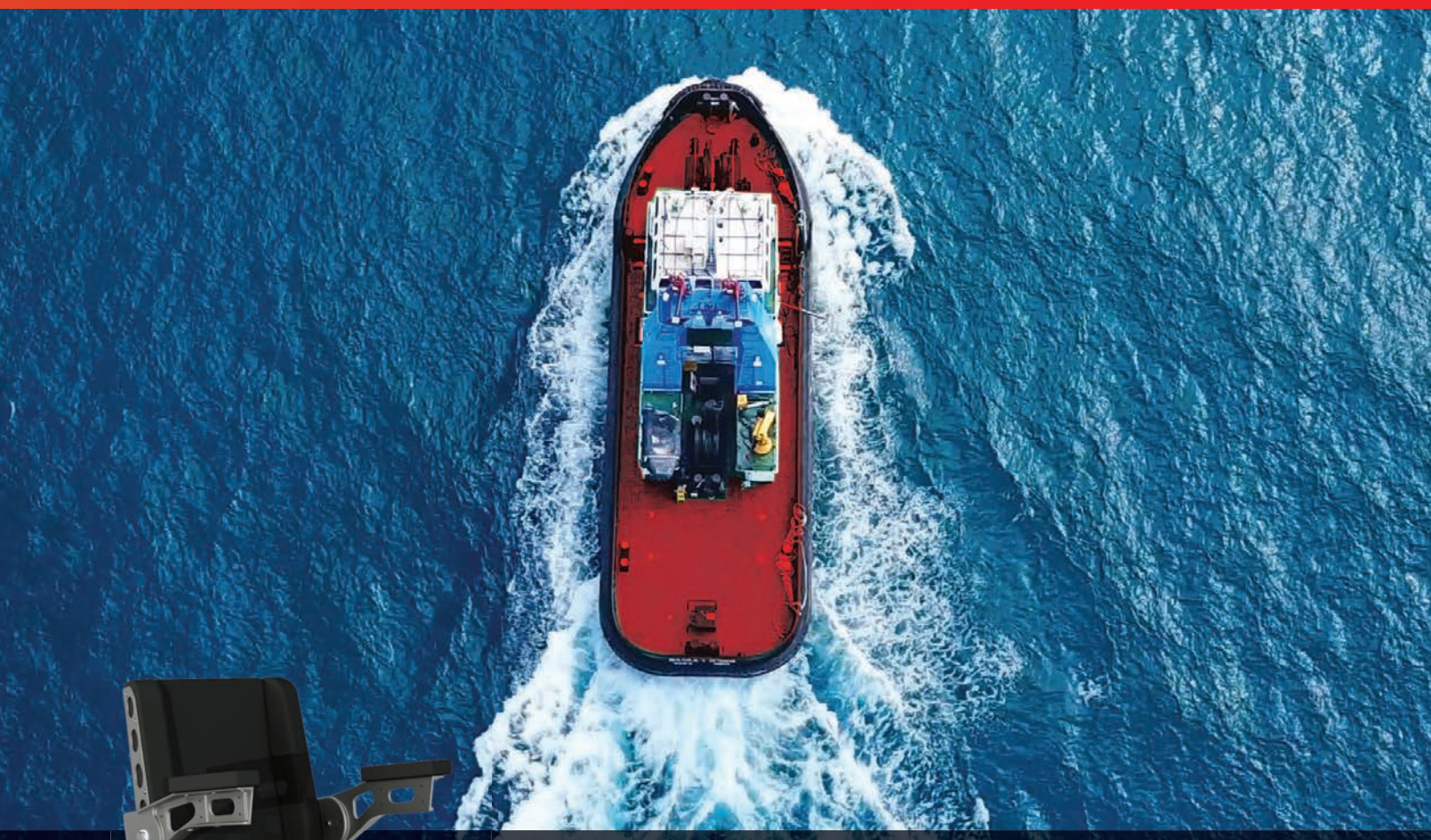

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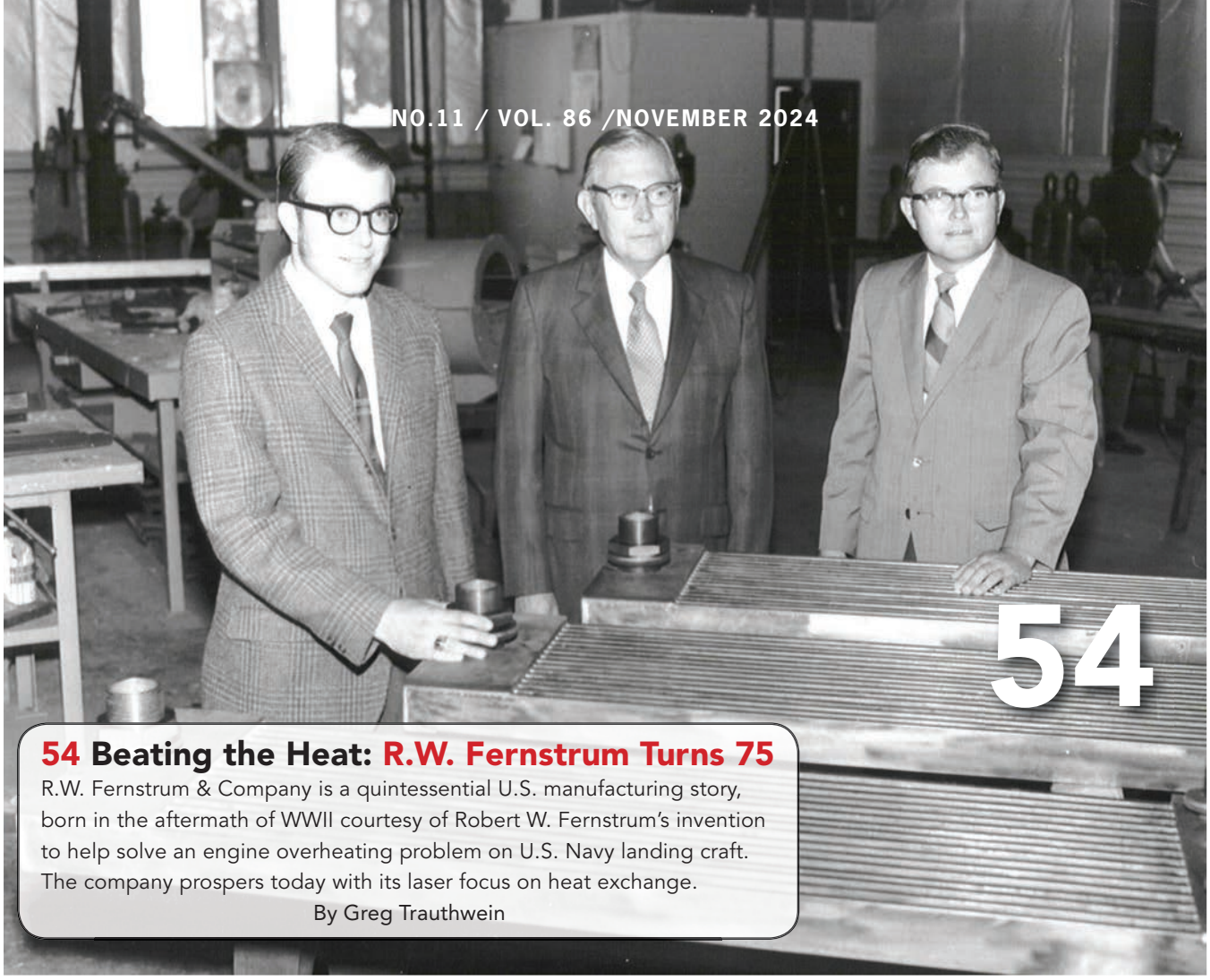

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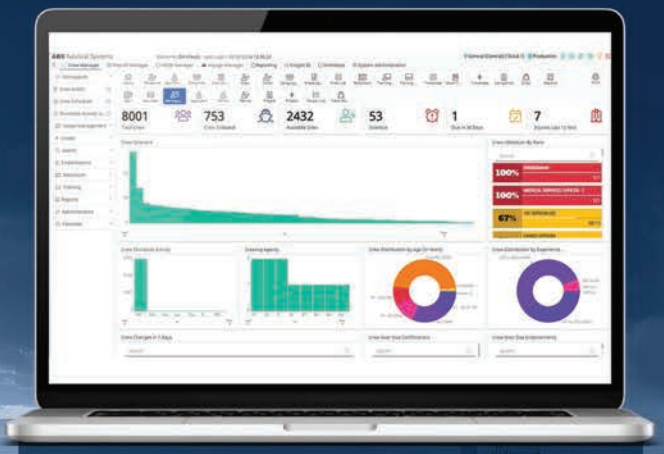

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Photo Justin Zurre

When I tell people I live in New York, there are hundreds of pre-conceived notions, mostly all premised on the hustle, bustle, history, attitude and politics of New York City. While my office is in Manhattan, personally I live on the south shore of Long Island more than 50 miles away from NYC, in many ways an idyllic place to live and raise a family [housing prices and property taxes notwithstanding!].

In the town I reside, I literally live five minutes from my boat, and once onboard I can be on the ocean in about 20 minutes crossing the Great South Bay. Many, many nights are spent on the bay and in the marinas dotting the coast of Fire Island, and here I have a front row seat to an array of personal and commercial boating traffic, including the many Fire Island ferries that were built by Rhode Island's Blount Boats, which this year celebrates its 75th Anniversary. Blount is an iconic Northeast builder of commercial craft, from its iconic ferries, to specialty work boats and new crew transfer vessels (CTVs) to service the burgeoning offshore wind business, too. We're happy to share insights on this shipbuilder's journey starting on page 62.

Another iconic company, R.W. Fernstrum & Company, is also celebrating its 75th anniversary, and late in the summer I was able to get three generations of Fernstrums on a single call to record a **Maritime Matters: The Marinelink Podcast** episode, an interview which included Paul Fernstrum, who next year celebrates his 60th anniversary with the company that his father founded. I've always enjoyed my conversations with the Fernstrum team, as their business is a great bellwether of the industry at large, plus I am always amazed at some of the off-grid maritime projects in which the company is involved. Read up on the history and future of what I consider a quintessential U.S. manufacturing story, starting on page 54.

With this writing, too, we say 'so long' to a good friend and great colleague in Eric Haun, editor of sister-publication *MarineNews*. Eric and I have worked together for more than a decade after we brought him in as an intern, and you will not find a more upstanding person or hardworking co-worker. In the era of "I" Eric is all about "we", and while parting ways leaves a gap, this business is small and it's rarely 'goodbye' rather 'see you again.'

While there will be a hole to fill, I'm happy to report that we were able to cajole long-time colleague and friend **Joe Keefe** out of retirement as interim editor, to bridge the void for the coming few months. Joe, in fact, was recently in Sweden for us at Volvo Penta's R&D facility to report on Northern Offshore Services latest Crew Transfer Vessel, a CTV that truly puts 'crew' first. That story starts on page 27.

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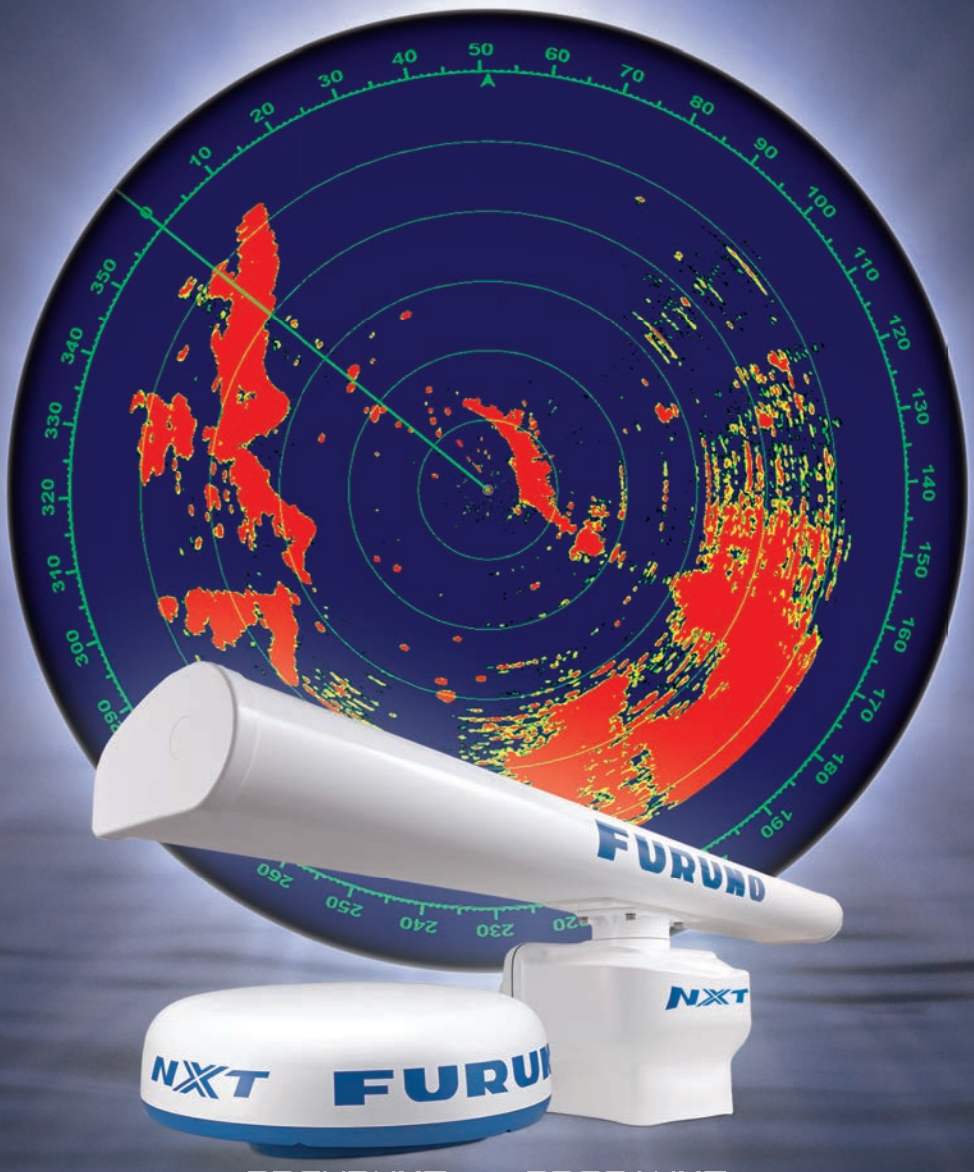

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Baltimore Bridge Incident

Challenging the Future of Maritime Law

By Kristen Teatom and Kevin Kearney, SVPs at Hugh Wood Inc.

On March 26, 2024, the Dali container ship crashed into Baltimore's Francis Scott Key Bridge, resulting in the loss of six lives. In June, the federal government announced that it had spent approximately $100 million to remove the wreckage and reopen the Fort McHenry Shipping Channel, which had been closed for nearly three months.

In response, the Department of Justice has filed a $100 million lawsuit against the ship's owners, Grace Ocean Private Limited and Synergy Marine Private Limited, accusing them of gross negligence. This incident sparks a broader conversation about accountability in the maritime industry. Regardless of what transpires from the lawsuit, its implications may set a significant precedent for the future.

Allegations of Negligence

The DOJ's complaint outlines serious allegations against the Dali owners. Chetan Patil, acting deputy assistant attorney general of the civil division's torts branch, emphasized that the accident stemmed from careless and grossly negligent decisions. He argued that the owners knowingly sent an unseaworthy vessel into a critical waterway, disregarding the inherent risks to human life and national infrastructure.

Benjamin Mizer, principal deputy associate attorney general, further alleged that the owners cut corners despite being aware of excessive vibrations aboard the ship that could lead to catastrophic failures. The ship reportedly lost power due to tripped circuit breakers in its transformer, a long-standing issue exacerbated by alleged makeshift modifications to the vessel's equipment. Patil indicated that the ship's automation was reck-

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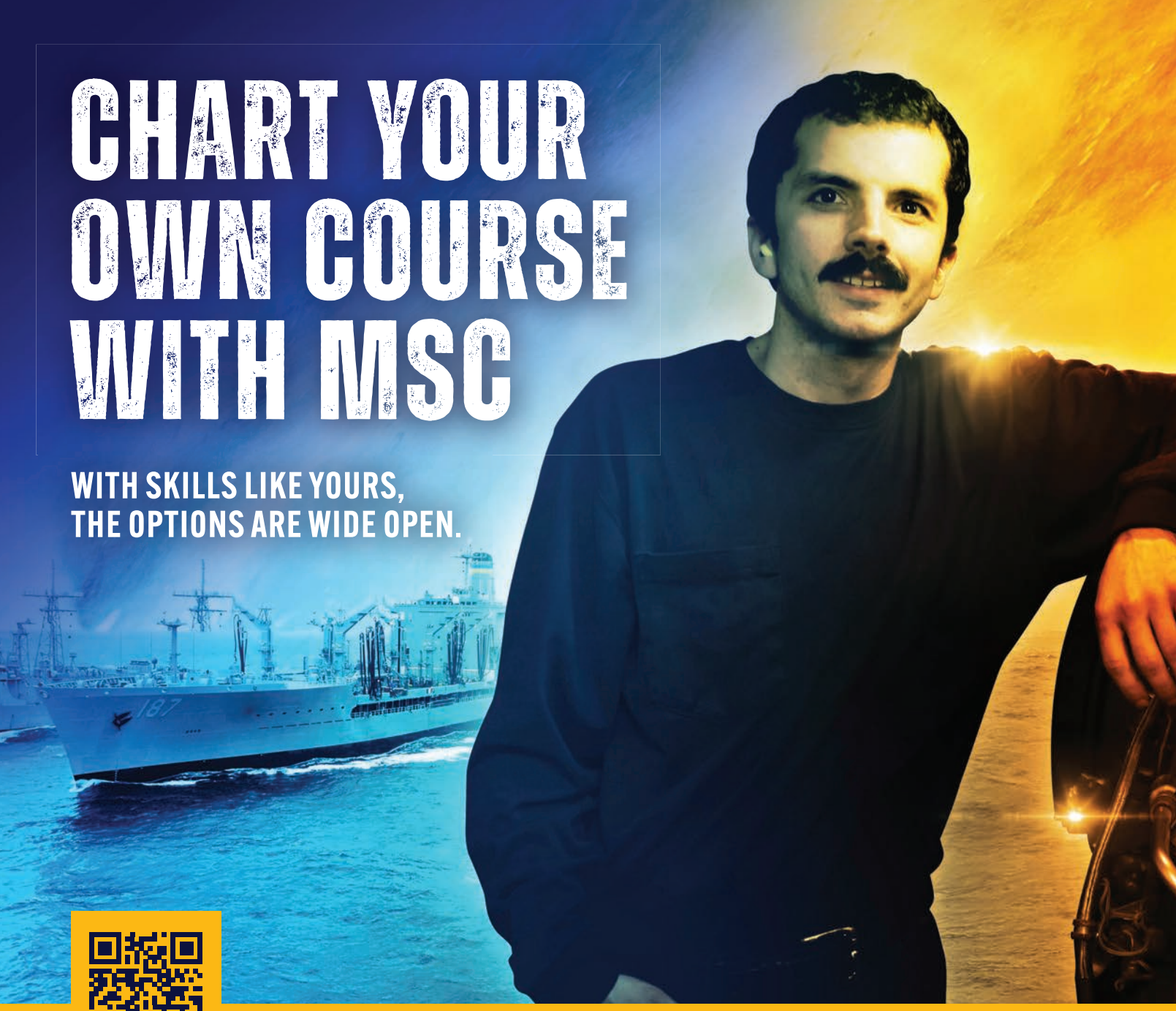

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lessly disabled, delaying the power supply shift to an alternate transformer. Consequently, the ship could not steer without power, leading directly to the collision with the bridge.

Maritime Law Implications

Criticism of Dali's ownership is loud and vocal. However, the vessel's owners have relied upon the 1851 Shipowner's Limitation of Liability Act as a protective shield. This law allows shipowners to limit their financial liability for losses and damages incurred during a voyage if they have no privity or knowledge of the negligence that caused the loss. The shipowners file the petition for limitation and claimants then have the burden to prove that an act of negligence or condition of unseaworthiness caused the accident. If the claimant proves this, the shipowner must then prove a lack of privity or knowledge of same.

Lawmakers originally instituted the act to protect shipowners from potential financial ruin due to the high risks of maritime commerce in the 19th century. However, it has increasingly come under scrutiny from a modern lens.

When established, lawmakers intended for the act to encourage maritime trade and protect shipowners against lawsuits arising from accidents at sea, where the owner had little control or knowledge of ongoing conditions. In 1851, unpredictable weather and piracy posed considerable risks, especially without immediate means of communication to the mainland. Legislators at the time feared that excessive litigation could stifle the American shipping industry.

However, as technology and safety standards have evolved, critics argue that the act now shields negligent corporations from accountability more than fosters a fair maritime environment. With modern advancements in communication, navigation, and weather forecasting, many argue that accidents like the one involving the Dali are primarily attributable to gross negligence rather than unavoidable circumstances.

Potential to Break the Limitation of Liability

The DOJ's claims against the owners of the Dali have the potential to challenge and possibly break the limitation of liability that the shipowners are petitioning for. The burden lies with the DOJ to prove that an act of negligence or condition of unseaworthiness caused the accident. Given the extensive investigation into this incident, they may be able to do so. Legal experts believe that the government's involvement may lend significant weight to breaking the limitation here, as well as future arguments for reforming or even abolishing the Limitation of Liability Act in certain contexts. However, repealing or reforming the Limitation is not without consequences.

Impact on Insurance and Future Practices

A significant consequence of abolishing or reformatting the Limitation of Liability Act would be the impact on insurance policies within the maritime industry. If shipowners cannot limit their liability, insurers would increase premiums to account for this increased exposure. And, as the legal landscape evolves, the potential for increased liability could prompt shipowners to reevaluate their risk management strategies and

insurance coverage. If the act is amended or repealed, it would redefine shipowner liability. The industry may need to adopt stricter safety protocols and improve vessel maintenance standards to mitigate risk. While this could serve as a warning to shipowners to prioritize safety and compliance with regulations, it could also result in shipowners diverting their vessels out of US ports. The incident involving the Dali container ship could serve as a pivotal moment for liability in maritime law. It presents circumstances that could be used to reshape the industry. While shipowners will hopefully use this as an opportunity to ensure the safety of their vessels, the Act still serves an important purpose in the global shipping industry.

UPDATE Dali Owner to Pay $102M

On October 25, 2024, the owner and operator of the cargo ship that struck Baltimore's Francis Scott Key Bridge in March, killing six people, agreed to pay $102M to the federal government. The U.S. Justice Department in September filed a civil claim seeking $103M from Grace Ocean Private Limited and Synergy Marine Private Limited, to recoup the money the U.S. government spent responding to the disaster and clearing the wreck of the Dali ship and bridge debris from the Port of Baltimore so the waterway could reopen in June. The Justice Department's lawsuit was brought as part of a legal action initiated by Grace Ocean and Synergy to limit their liability for the crash to $44 million, a sum department officials dubbed inadequate.

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The Rolling Stones were wrong ... Time is not on my side.

Engineering Myth Busted

By Rik van Hemmen

Too often a myth is created and if not killed off right away, it will take on a life of its own and time will not debunk it. Many myths are created for evil or political purposes, but some myths just occur because the truth is just too complicated.

Some of those myths don't even make sense, but there is no available data to establish the truth.

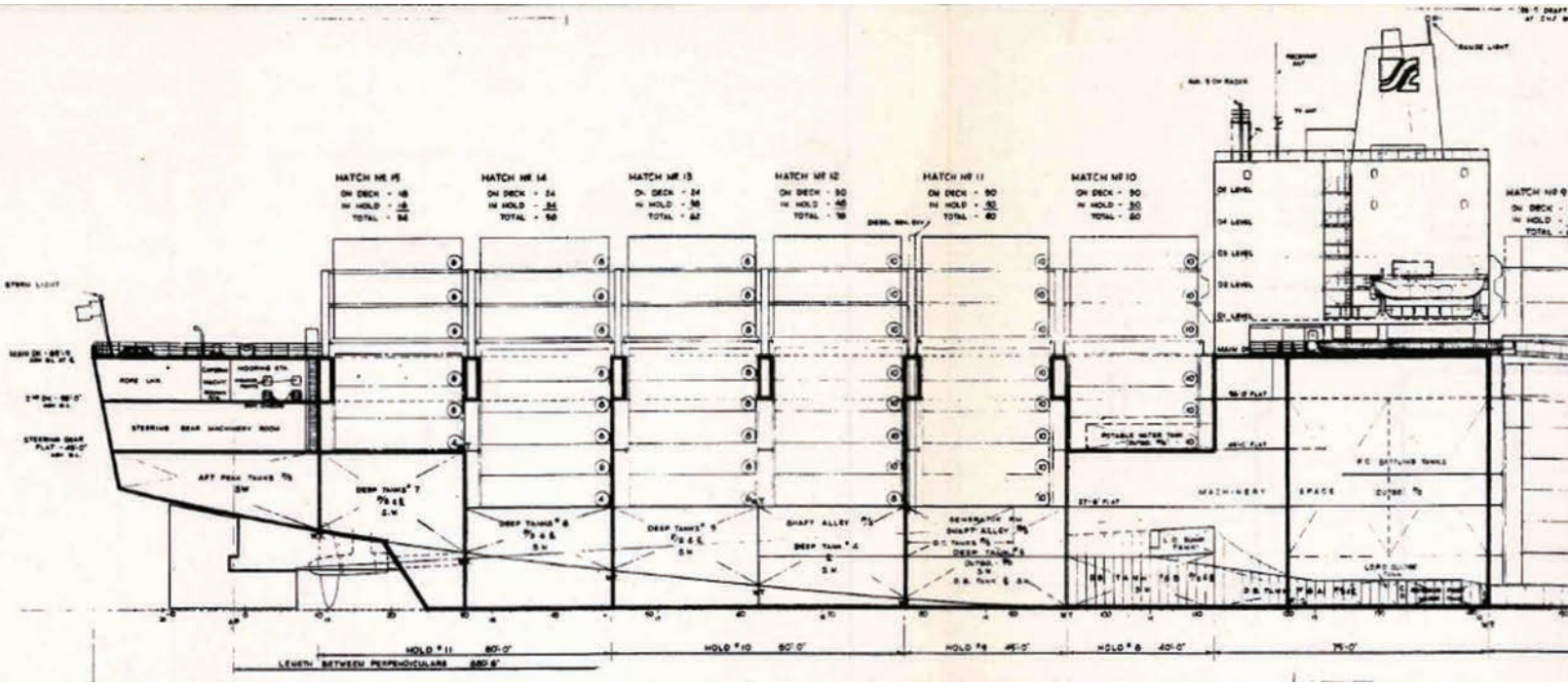
As a very young engineer I was told that the aft accommodations of the SL-7 container ships were installed backwards. They sure look backwards, and having accommodation doors face a 40 mph headwind made no sense. But why would they be installed backwards? Over the last 40 years I raised this subject with at least a dozen Sea-Landers and all confirmed it. When I asked why, most said they did not know, or defaulted to the classic "because engineers designed it."

At best, I received vague answers such as the first house was preassembled and when they wanted to fit it on the hull, they could not rotate it so they redesigned all eight vessels to have backwards houses. That made no sense, but as a young engineer you can ask only so many questions before more senior engineers tell you to get back to work.

So, I was left to ponder this issue during dark stormy nights when my wife told me it was my turn to change the baby's diaper for once. Or later in life, when I woke up wondering whether to get out of bed to get a handful of Tums, or just ride the indigestion out. Time was not on my side, because with the passing years who would be left that knew the truth?

That all turned upside down while working on the SL7expo project, when **Raj Sengupta** told me the designer of the SL-7's is still alive. **John Boylston**, who was the primary designer of the SL-7's when he was still in his twenties, provided us with some incredibly valuable information on the design of these vessels.

But nothing on backwards aft houses.



Courtesy Rik van Hemmen

After a few emails on other subjects, I finally screwed up my courage and raised the subject.

John responded, and I provide the truth in his own words:

While an interesting story, it is incorrect. To see why, you need an inboard profile.

You can see where the turbines are located, they are located as far aft as possible.

This was because the shaft lines, if kept short as possible would only affect the height of aft stowed containers below deck, as the shaft line dictates where the bottom of the aft hatches are located.

It was desirable not to have too many containers aft as the fine shape of the hull, particularly aft, provided limited buoyancy and too much load back there would require forward ballasting.

The fine lines of the ship, a block coefficient close to 0.5, also made the ship incredibly deadweight limited so, in operation, a ton of fuel used was replaced with a ton of ballast.

The GM of the ship loaded had a quarter inch of margin so keeping weight low was a requirement as the ship made passage.

This then required that the boilers be placed forward of the turbines, as to place them aft of the turbines, not only affected trim, but stability as the boilers would have had to be raised above the shaft line.

With both 35 foot and 40-foot cells forward of the forward engine room bulkhead, we could just get the number of cells required to meet overall container capacity.

The boilers were oversized as operations required the ship to operate at 80% power on one boiler in case one boiler went down.

They also required antique D type boilers as that is all the engineers, in the fleet of WWII converted tonnage, knew how to operate. I thought both of these decisions absurd, as they compromised a difficult design even more.

You can see the boilers are so huge they come through the main deck.

Boilers providing steam to 120,000 HP of turbines

Courtesy Rik van Hemmen

require a lot of air, so the forward location was so arranged that the front of the house lined up with the forward ER bulkhead and air entered from the forward house bulkhead, providing better flow to the forced draft fans. Attempting to get air into the boilers from the side of the house at almost 40 mph would have required huge scoops which would have added drag we hardly needed.

Wind tunnel tests showed that with full containers on deck the air flow went over the top of the house, so a flat forward house front did not affect drag.

With all the equipment needed for the forced draft and other associated boiler auxiliaries in the forward house set in there, we found we could narrow the house enough to get lifeboat stowage on either side of that house structure.

This was important as to get all accommodation into the length left between the forward ER bulkhead (or last forward cell aft bulkhead) and the forward bulkhead of what was desired for the first aft container stow, we needed a narrow accommodation block, forward and aft, and thus could go to the full beam of the ship to get the accommodation fitted. You can see it comes out to the side of the ship.

In a USCG decision made during construction that really annoyed me, the secondary set of access from the decks of the accommodation (a series of vertical ladders that was approved by the USCG in drawing approval), was rescinded and balconies had to be fitted.

Similar to the house front wind tunnel tests, those tests showed the airflow, as designed, would not be affected by the accommodation bump out past the forward section of the house and the balconies somewhat screwed that up for us.

We still did 34.2 knots in one fully loaded run.

Myth busted! And what is most telling is that, once again, the truth is much more complicated than the myth. Thank you, John; for designing these great ships, and for finally allowing me to sleep more peacefully.

In the spirit of this column, I suppose I should also note that the Stones neither wrote nor first recorded *"Time is on my side"*. The song was written by **Jerry Ragovoy**, who wrote the title, melody and chorus. **Kai Winding**, a Danish-American jazz trombonist, and Newark Nightingales **Dee Dee Warwick, Dionne Warwick** and **Cissy Houston** (Yes, Whitney's mother) recorded it. The song was released on the Verve Records label in October 1963 and received some radio coverage but did not chart. There ... another myth busted.

For each column I write, *MREN* has agreed to make a small donation to an organization of my choice. For this column I choose Holiday Express, holidayexpress.org, a group of musicians and volunteers that has been providing human kindness since 1993.

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Future Fuel or Not ... ... Hydrogen will Power the Clean Energy Shift

By Sean Caughlan, PE, Principal, Marine Engineering, Glosten

The marine industry is faced with the enormous challenge of reaching net-zero greenhouse gas emissions by midcentury to meet ambitious targets set by the International Maritime Organization (IMO). Globally, the marine sector contributes to approximately 3% of total greenhouse gas emissions, and in the US, commercial and recreational vessels accounted for nearly 3% of the country's greenhouse gas emissions in 2021. In the near term, the revised IMO GHG Strategy adopted at MEPC 80 aims to increase the uptake of zero- or near-zero-emission energy sources to 5–10% of energy from international shipping by 2030.

This cannot be achieved with technology alone.

The marine industry has evolved around the use of fossil fuels; ship designs, shipping routes, ports, fuel supply, skilled labor, and commercial business models are all keyed to the cost and energy density of diesel. Achieving our near- and long-term maritime decarbonization goals will not only require improvements in the efficiency of technologies like fuel cells, batteries, and clean combustion, but the industry will also need to make a major shift towards low- or zero-carbon fuels that are both clean to produce and consume.

It's not at all clear what the fuel or fuels of the future will be. Green methanol, green ammonia, green hydrogen, and even some biofuels all show promise, but the ability of these fuels to scale successfully will dictate whether or not they are adopted. Today's fossil fuels are extracted from wells and then refined and transported to markets, but fuels of the future will need to be manufactured. This will take process energy and feedstock materials, collectively known as a fuel pathway, which can have an enormous impact on the carbon intensity of a fuel. Not only will the energy to produce the fuels or feedstocks need to come from zero-carbon sources, such as wind, solar, or nuclear—they will also need to economically viable.

Most hydrogen today is made from steam methane reformation (SMR), sometimes called "grey hydrogen." This is currently the lowest-cost means of producing hydrogen, but it also generates a significant amount of carbon dioxide. For additional cost, it is possible to add carbon capture and storage (CCS) downstream of the SMR process. Hydrogen made from SMR combined with CCS is known as "blue hydrogen." Electrolysis powered by renewable electricity, such as solar or wind, can be used to separate oxygen and hydrogen from water. The hydrogen produced by this process is called "green hydrogen." The industry uses these colors because differentiating the various production pathways is essential to understanding the carbon intensity of hydrogen as a fuel or a feedstock. It is clear that a lot of green hydrogen will be needed for the energy transition, but today the cost is many times higher than grey hydrogen. This is a challenge that the US Government is attempting to address.

The Inflation Reduction Act (IRA) is the largest investment in reducing carbon pollution in US history and is expected to reduce US carbon emissions 40% by 2030. The Energy Earthshots™ initiatives were launched in 2021 by the DOE to accelerate breakthroughs in clean energy within a decade. Two of these, the Hydrogen Shot and the Clean Fuels & Products Shot are significant for the maritime industry's need for greener fuels. The former seeks to lower the cost of clean hydrogen by 80% in ten years, to one dollar per kilogram. The latter's goal is to decarbonize the fuel and chemical industries and advance cost-effective technologies with a minimum of 85% lower GHG emissions by 2035.

The Bipartisan Infrastructure Law (BIL) has funded seven regional clean hydrogen hubs (H2Hubs), managed by the DOE's office of clean energy demonstrations. The H2Hubs will invest in both blue and green hydrogen as part of the US plan to jump-start the clean hydrogen industry. These are a key piece of the national clean hydrogen strategy and are aligned with the Hydrogen Interagency Task Force which is coordinating the government's holistic approach to developing green hydrogen.

As a fuel, hydrogen produces neither carbon nor local emissions. It can be combusted in an engine to produce mechanical power or chemically reacted with oxygen in fuel cells to produce electricity. Fuel cells can be used to power electric ships, but some efficiency losses must be accounted for in the electrical conversion. Like many emerging technologies, fuel cells present challenges associated with cost, scale, and regulatory maturity, but are quieter and more efficient than a combustion engine.

Hydrogen has low energy density compared to other fuels, but is an attractive option for the right application. Hydrogen can be stored as a compressed gas or as a liquid; liquid hydrogen is a cryogenic fuel and more energy dense than compressed hydrogen, but it is harder to make, more challenging to handle, and requires special equipment to store and vaporize before use. Compressed hydrogen is less energy dense but easier to produce and simpler to store and use. For short-range applications where battery-electric is not feasible, hydrogen may be an excellent fuel choice. Battery-electric has become an increasingly popular method of converting ferries and other harbor craft to zero emissions, but requires access to shore power for charging. For many marine electrification projects, it can be expensive and time-consuming to get the necessary charging infrastructure permitted and built. The power required for rapid shoreside charging puts a strain on the grid and batteries are often a necessary addition to charging infrastructure to minimize peak loads. Harbor vessels and ferries operating in areas that cannot support shoreside charging could benefit from hydrogen fuel as an alternative to electrification.

The marine industry is not alone in the need for clean fuels or green hydrogen. Other industries considered hard to abate, such as aviation, steel production, and agriculture, could become large consumers of green hydrogen as both a fuel and a feedstock for various low-carbon fuels or chemicals. The aggregate demand for green hydrogen will help to drive the costs down as well as the required infrastructure needed for production and distribution. Production will require massive amounts of carbon-free electricity such as wind, solar, geothermal, and nuclear power, as well as new facilities for fuel production. New infrastructure will be needed for transport and storage, which could benefit the marine industry. For example, specialized tankers will be needed to transport the fuels from where they are produced to where they will be consumed, and ports will need ways to store and transfer clean fuels so ships can be bunkered for long voyages.

Moving the needle for marine decarbonization and the production of green fuels will require domestic and global action. COP 28 saw landmark agreements to scale up renewable energy, phase out fossil fuel subsidies, ramp up clean hydrogen production, and increase energy efficiency. The Green Shipping Challenge, co-led by the US and Norway, spurred COP 28 announcements around actions to increase use of low- and zero-carbon fuels. The process of shifting industry away from a reliance on fossil fuels is well underway. Already we are seeing initiatives to prepare the supply chain for clean fuel and the development of new and existing technologies required to achieve decarbonization targets. Regardless of whether hydrogen emerges as the fuel of the future, all low- or zero-carbon fuels depend on its abundance and availability. The chemical energy in all potential marine fuels—whether diesel, methanol, methane, ammonia, or even pure hydrogen—comes from the rearrangement of hydrogen atoms during chemical reactions in combustion engines or fuel cells. New technologies will be required to reach our lofty decarbonization targets, but the energy transition will only be possible through a massive scaling up of production and green fuels, renewable and clean energy, and a lot of hydrogen.

The Author

Caughlan

Sean Caughlan is a principal marine engineer at Glosten. Sean is one of the industry's leading experts on the design of alternative-fueled, battery-hybrid, and all electric powered vessels including ferries, tugs, Ro-Ro ships, and research vessels.

FIRE&ICE

GENOA DESIGN EXCELS IN GOVERNMENT, MILITARY, ICEBREAKING MARKETS

Genoa Design International has been providing production design and 3D modeling services to shipbuilding and offshore industries from Newfoundland and Labrador for nearly 30 years.* COO Laurie Balan *sees ample opportunity for growth, with defense budgets booming around the world and the recently signed Icebreaker Collaboration Effort (ICE PACT) between the Canada, Finland and the U.S. to collaborate on the production of polar icebreakers.

By Greg Trauthwein

All images courtesy Genoa Design International

Can you give us a personal and professional history with insights on your responsibilities today at Genoa Design International?

I've spent the majority of my career, over 20 years now, in shipbuilding, primarily in Canada. That's where we've seen a significant resurgence of ship design and shipbuilding over the last couple of decades. I graduated from Memorial University in Newfoundland & Labrador as a mechanical engineer, and I thought at the time I was going to spend my career in the offshore oil and gas industry because it was booming at the time. After a short stint overseas, I returned to the Atlantic provinces and was introduced to the working world of naval architecture and marine engineering. Over the next decade or so, I was engaged in design work, engineering changes for ships in operations, so the maintenance of ships in service support programs, mainly for the Canadian Navy, the Canadian patrol frigates.

After that [I transitioned] to newbuilds, as the national shipbuilding strategy took off and we started designing and building ships that were desperately needed in Canada.

Today at Genoa, as the chief operating officer, I'm responsible for, of course, all the operations and the business performance of the company. That includes everything, from customer delivery where make sure that we execute quality products with constant schedule certainty, to market and business development, communications, human resources and talent development. I really get to touch the entire organization, which I absolutely love. I also get to work really closely with a pretty tight executive team as well as our board of directors to develop the strategy for the company. At a time when geopolitical pressures are putting a lot of pressure on the industry, it's an exciting time to be here and to be the COO of a company that is thriving and innovative.

Can you give us a 'by the numbers' look at Genoa Design today?

I think it's worth looking at Genoa over the last 10 years or so to get a true picture of our growth. When Canada entered an era of rebuilding, the industry that had been essentially dormant for a couple of decades, meaning there were new and exciting programs to work on, and it gave companies like Genoa an opportunity to work on engineering projects that were design-related, problem-solving. We were fortunate to have joined forces with Seaspan and other supply chain partners

"Looking out over the next five to 10 years, we will see more growth in the US, building on a base that we have started. We've built relationships there, we know the culture, we're part of the culture, and that's where the significant backlog of government work resides at the moment in the shipbuilding industry. Hopefully, the **ICE Pact that's recently been announced between Canada, Finland and the US** *will promote opportunities for companies like Genoa to export our expertise and continue that growth and development in Canada, but also outside of Canada."*

LAURIE BALAN, COO, GENOA DESIGN INTERNATIONAL

from the early days, and that's where we grew and matured as a company. We grew from about 20 employees to about 240 across Canada and the US today. Our revenues grew exponentially as well over that timeframe.

Please give insight to your work today, with insight on where you see it growing in the coming decade?

Most of our work today is government and navy contracts. We still do commercial work from time to time when it aligns with our strategic direction, but for the most part, we work on major large programs in Canada and the US, mostly for the US Navy, US Coast Guard, or Canadian Navy and Canadian Coast Guard.

In terms of numbers, about 70% of our work is defense related. About 75% of that right now is currently in Canada. Looking out over the next five to 10 years, we will see more growth in the US, building on a base that we have started. We've built relationships there, we know the culture, we're part of the culture, and that's where the significant backlog of government work resides at the moment in the shipbuilding industry. Hopefully, the ICE Pact that's recently been announced between Canada, Finland and the US will promote opportunities for companies like Genoa to export our expertise and continue that growth and development in Canada, but also outside of Canada.

There's a lot of geopolitical conflict right now. Obviously, there's a lot of investment in defense globally. Can you put in perspective this bump?

I don't know how big I expect it to get, but certainly the problem is massive now. There's not enough infrastructure, shipyards, design companies, people and innovation in one country to develop it and do it all in-house. We've been fortunate along the way to have worked successfully with US companies. We have all the security requirements and defense requirements to be able to partner. That demand is obvious. There's so much work to be done, there's so many new ships to be designed and to be built that we need expertise from more than just inside the US and more than just inside of Canada.

Even under the national shipbuilding strategy, while the intent of that program was to build up the Canadian industry, that too is beyond ourselves and our expertise and we've reached out to other companies with expertise from the likes of Finland to be able to accomplish it all. I think there's a lot of opportunity for multiple companies, whether they're Canadian based, US based or elsewhere, to answer the call and stand up to the challenge and be innovative.

Looking at recent projects, is there one or two that stand out in terms of showcasing the value that Genoa Design delivers?

Right now there are two major concurrent projects that we're working on: the icebreakers for Canada and the icebreakers for the US. Both countries are replenishing their heavy icebreaker fleet, as the current vessels in operation went into service before I was born. An opportunity to contribute to the designs of those complex vessels highlights Genoa's expertise in icebreaker design. While we typically ramp up our teams later in the functional design phases, our designers have to be intimately familiar with ice class rules and detail the design in a way that meets those rule sets, as well as the build strategy and processes. Working on those two programs, north and south of the border, two different designs, materials, shipyards, organizational structure, technical stacks, tools, you name it, the list goes on. That really speaks to Genoa's adaptability and agility that we show our clients.

The Newfoundland & Labrador cluster is unique in how it operates together. Looking at the cluster around you, can you discuss what your company puts into it, and what your company gets out of it?

More so than any other province, Newfoundland & Labrador's history is linked to the sea. We are uniquely positioned as the gateway to the Arctic as well as to Western Europe. Our schools are noteworthy in terms of how they support the industry. Our schools are second to none, whether it's MUN, the Marine Institute, College of the North Atlantic or other private colleges in the province. Graduates are recognized as top in their field and are ready to work anywhere in the world when they graduate. We have outstanding companies here, and you don't have to look far to find locally grown companies like Genoa, Kraken and Virtual Marine – to name a few – at the forefront of innovation. We have research & development, simulation and innovation centers here that are developing leading edge solutions that are being used across the globe.

If anything, our province could do a better job of promoting ourselves. We're a bit humble as a community, as a province, and maybe we need to toot our own horns a little bit more to share our knowledge and our expertise with the world. There's a real sense of cooperation and camaraderie here in the province of Newfoundland & Labrador that I don't think you see everywhere. There is something special about Newfoundland and Labrador, for sure; there's something special about Genoa, and the local supply chain here, too. Those are some of the reasons that I'm still so passionate about this industry, which is typically viewed as a 'traditional' industry. [Part of my job] is to share those stories and attract younger professionals [to fuel] the next generation of the industry. We're innovative, we're fun, and we apply new tools and technologies to make this industry better.

Watch the full interview with Laurie Balan, COO, Genoa Design International, on **Maritime Reporter TV:**

Join us for a lunch and panel discussion:

CYBER SECURITY IN THE MARITIME SECTOR

What You Need to Know Now

A moderated discussion on emerging USCG cyber security rules and their potential impact on vessel owners and operators.

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MARITIME REPORTER AND ENGINEERING NEWS

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PRECIOUS

Credit: N-O-S

CARGO

As global offshore markets evolve to create a more sustainable future, rising up to meet these challenges is Sweden-based Northern Offshore Services. Offshore engineers won't be the only beneficiary – but they might be the most important.

By Joseph Keefe

"The offshore wind industry is relatively young and has grown tremendously during the last 15 years. Since we began N-O-S in 2008, we have seen wind turbines become significantly larger, which results in more maintenance, increased downtime and more technicians at sea. These are just some of the challenges that are catalyzing innovation and driving the design and manufacture of our vessels in house to meet the customer demands of tomorrow."

– David Kristensson,
CEO and Owner of N-O-S Group

Credit: N-O-S

In August, Northern Offshore Services (N-O-S) unveiled its unique I-Class Crew Transfer Vessel (CTV), powered by the first commercial application of Volvo Penta's IPS Professional Platform. In the cutting-edge ***IMPRESSER***, N-O-S designed a flexible, future-proof CTV that will adapt to and accommodate new technologies and energy solutions over the next 25 years, all of which is targeted to exceed the needs of their most important cargo: the offshore engineers that they serve.

"The offshore wind industry is relatively young and has grown tremendously during the last 15 years. Since we began N-O-S in 2008, we have seen wind turbines become significantly larger, which results in more maintenance, increased downtime and more technicians at sea," said David Kristensson, N-O-S Group CEO and Owner. He adds, "These are just some of the challenges that are catalyzing innovation and driving the design and manufacture of our vessels in house to meet the customer demands of tomorrow."

Operating globally in over 90 wind farms, N-O-S vessels completed 118,000 successful cargo and/or personnel transfers in 2023 alone. The young firm has quickly become one of the world's most recognizable providers of CTV's. With 67 vessels, operating mostly in CTV markets, Donsö-based N-O-S also found the CapEx to fund 24 newbuild deliveries during the same timeframe. That would be heady stuff for most companies, but as Mr. Kristensson often says, a forwarding thinking firm "should not just sit on its hands, rather, it should stand on its toes."

The lion's share of business takes place in UK and Denmark offshore waters, but N-O-S has its eyes on a bigger prize. The wind farm market, a wild card for investors trying to figure out which way the winds are blowing, creates uncertainties that swirl everywhere; in particular, the American markets. N-O-S has nevertheless plunged ahead there, as well. Their Providence, RI-based fledgling joint venture subsidiary group, American Offshore Services (A-O-S), should have four Jones Act-qualified vessels in operation by yearend. The five-year goal is 6-10 more.

Two Kinds of Green: **Quality Trumps Quantity**

N-O-S has no intention of expanding only in terms of fleet numbers. This means focusing on converting the existing fleet to one which not only anticipates, but both satisfies and exceeds regulatory and environmental requirements, with an eye

on electric and hybrid solutions. That comes at a cost. Some estimates might put the cost of the fully integrated Volvo Penta IPS propulsion system with all the bells and whistles at a 20% premium to another solution. According to N-O-S, that's just smart business.

Johan Inden, President of Volvo Penta Marine, explains why. "It is our partners who, in part, drive our innovation. We are creating something the customer doesn't need today, but will likely want tomorrow."

Looking ahead, a hybrid battery equipped IPS allows longer tours at sea. The diesel engines provide safety and speed enroute, but once on station at a windfarm, the vessel can operate on electric only. These IPS equipped vessels can operate in electric, hybrid or diesel modes. Recharging the batteries can take place underway. But if not, then it can be done using Volvo Penta's modular containerized portable battery charging units at the dock of your choice.

"Green" is a moving target. What was green previously may not qualify in the future. That creates serious risk for financiers, operators, and wind farm operators alike. N-O-S has addressed, if not embraced some of that risk. This longer-term vision will deliver what David Kristensson characterizes as "future proof" vessels – hulls that can be upgraded in terms of propulsion and environmental solutions – is just the ticket.

N-O-S looks forward to the day that greener vessels will provide better day rates. In the meantime, that involves risk – financial risk. Kristensson explains, "I would say that we have difficulties to cover our costs where we've been building greener vessels today. The economics are not there yet. So, we are building our platforms so that you can convert it later when the commercial sense or the right project might demand it. Then, you don't need to build a new vessel, you can upgrade the existing platform. Of course, there are benefits to having a green platform today, as compared to conventional vessels."

Comfort & Safety, too

As industry moves towards having permanent offshore crews on board, and moving away from dayshift work for larger fields, bigger and more capable vessels will be required. Today, there are 7,000 turbines on the water, but matching vessel size to the size of turbines is a big challenge, especially as wind moves further offshore. Newer, bigger turbines demanding bigger, more robust boats that can perform in harsher conditions, for longer periods of time. Summer work may not be a luxury any longer. It is no accident that N-O-S finds itself at the leading edge

Credit: Volvo Penta

"It is our partners who, in part, drive our innovation. We are creating something the customer doesn't need today, but will likely want tomorrow."

Johan Inden,
President of Volvo Penta Marine

of this transition.

Offshore engineers – typically non-mariners – need to get offshore safely and in real comfort. Workers who arrive at the worksite seasick, battered by rough seas, cannot provide professional service, assuming they are in any condition to work at all. N-O-S is mindful that these personnel are their most important cargo. The modern CTV boasts maximum comfort for wind technicians in transit. On the CTV IMPRESSER, they arrive offshore ready to work, free from motion sickness. In an industry where it is a struggle to find and keep qualified technicians for challenging work environments, this operational philosophy is an attractive value-added plus for offshore energy firms.

The ongoing modernization of N-O-S tonnage takes many forms. Take their proprietary, in-house designed "high grip fender," for example. Vexed continually by the short life span of traditional, low-tech bow fendering equipment, N-O-S set out to develop their own five-piece system, which involves different materials for each segment, all of which can be replaced or serviced individually. The innovative fix allows CTVs to push at wind towers using less fuel and energy. Combining an omnidirectional propulsion system and the High Grip Fender, N-O-S operators leverage the versatile I-Class CTV to make longer, safer journeys and safely offload and onboard technicians in any sea condition.

Balancing Act: **Operational Integrity & Financial Realities**

It is no accident that N-O-S executives David Kristensson and Martin Landstrom are both professional mariners and bring career experience from the tanker side of the equation. Kristensson told ***OE***, "We look at things from an operational point of view. This is important to us because we have been mariners ourselves. Perhaps if you are from the capital side, your focus is more economics. We look at things more from the operational side, and this is one of the benefits of our experience, as we gain our success."

Veterans of the well-established and sometimes tedious and redundant oil major SIRE (OCIMF) inspection protocols, Kristensson and Landstrom understand the demands that these requirements imposed on the tanker sector. And, for good reason. A similar inspection scheme has evolved in the CTV sector. N-O-S executives, mindful of their roots, have embraced the concept and are determined to not only be in compliance, but to lead from the outset.

Kristensson explains, "We didn't bring safety inspections to wind, but we brought experience with how it works. We used that knowledge in our company when the wind industry started to increase the quality inspections. The industry has

Credit: Joe Keefe

The christening of the CTV IMPRESSER was a joyful event, well attended by a wide spectrum of industry stakeholders. On the Dais were the many children of both N-O-S executives David Kristensson and Martin Landstrom. Following the playing of both the Swedish and Danish national anthems, the magic moment took place to thunderous applause from the joyful gathered masses.

come very far, and today is very much up to date with quality inspections, and safety management systems. And, some of the [energy] customers are the same because the oil firms are starting to work in wind, as well."

Kristensson continues, "For us, it is very important to be one of the quality leaders because that is what we believe in and also, it helps us to gain work. Our customers look and both quality and performance. But, not just for us; the whole industry needs to be safer, because accidents can impact future work offshore."

The Future is Now

N-O-S envisions a 25-year lifespan for all their tonnage – whether achieved through re-power or newbuild. This means anticipating and penetrating new offshore markets – wherever they emerge, embracing new technologies that advance a greener footprint, emphasizing safety, while also creating free space on board for core operations. Eco-friendly fuels and new propulsion solutions lessen the carbon footprint of not only N-O-S, but also the industries that they serve. That's not happening tomorrow. The future is now.

Kristensson looks ahead, opining, "What has been primarily a northern Europe industry is now starting to go

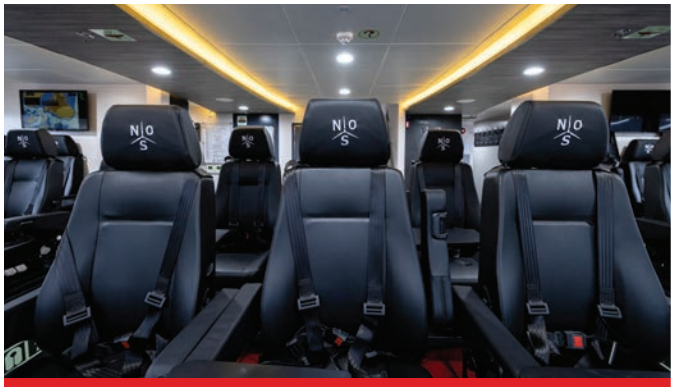
Credit: N-O-S

Credit: Joe Keefe

WHEN IT COMES TO UNMANNED ENGINEERING SPACE CONTROL, IT DOESN'T GET ANY MORE HIGH-TECH OR CONVENIENT THAN VOLVO PENTA'S BRIDGE MOUNTED ENGINEERING CONTROL STATION.

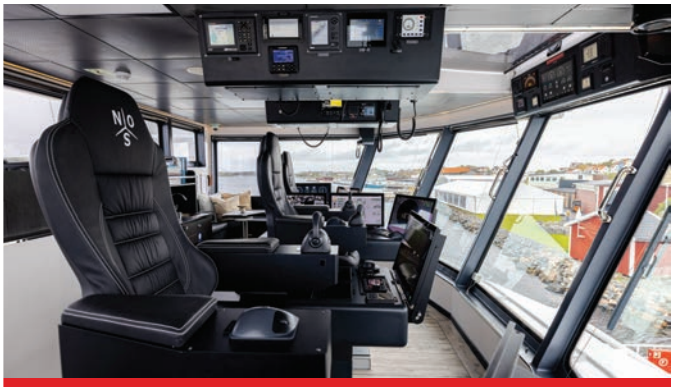
Credit: N-O-S

THE INNOVATIVE N-O-S IN-HOUSE DESIGNED FIVE-PIECE HIGH GRIP FENDER SYSTEM.



Credit: N-O-S

THE MODERN CTV BOASTS MAXIMUM COMFORT FOR THE WIND TECHNICIANS IN TRANSIT. N-O-S KNOWS THAT THESE PERSONNEL ARE THEIR MOST IMPORTANT CARGO. ON THE CTV IMPRESSER, THEY WILL ALL ARRIVE AT THE OFFSHORE WIND FARM READY TO WORK, FREE FROM MOTION SICKNESS.



Credit: N-O-S

THE BRIDGE ARRANGEMENT ON THE NEWEST N-O-S CTV. A HIGH TECH, MAXIMUM VISIBILITY WORK ENVIRONMENT THAT INCLUDES AN INDUSTRY LEADING CONTROL SEAT FOR THE CHIEF ENGINEER, AS WELL.

global. Taiwan and China were the first to start outside Europe, and now we see it taking off in the US, but maybe going a bit slower there than expected. The outlook in the next five years is for huge growth in the offshore wind industry. Certainly in Europe, but also globally."

Just as offshore wind can take lessons learned from oil tanker safety protocols, so too can the fledgling North American wind markets benefit from experience – and yes, mistakes – that the European markets have seen. Kristensson explains, "What can the US do today? Exactly what you are doing: looking at Europe and try to learn from our experiences. You are also starting from a higher perspective because the turbines you are starting with are already quite big, and in Europe, we started with much smaller turbines."

"It is not easy to be first in any market or endeavor. This requires close collaboration with Flag and Class," says Kristensson. As N-O-S looks ahead to a second, cutting-edge I-Class vessel, it will come bringing 'lessons learned' as they grow their nascent U.S. subsidiary, American Offshore Services. In an uncertain world and an unpredictable offshore energy environment, that's a safe bet.

Credit: N-O-S

Martin Landstrom,
Director, N-O-S

Credit: N-O-S

"What has been primarily a northern Europe industry is now starting to go global. Taiwan and China were the first to start outside Europe, and now we see it taking off in the US, but maybe going a bit slower there than expected. The outlook in the next five years is for huge growth in the offshore wind industry. Certainly in Europe, but also globally."

– David Kristensson,
CEO and Owner of
N-O-S Group

SMARTER THAN FISHING FOR TRASH

There is a small but global fleet of clean up boats preventing trash from flowing into the ocean. More than that, these battery-powered, autonomous boats are performing a growing range of other tasks.

By Wendy Laursen

Image source Clearbot

Source Water Witch

UP TO 70% RECYCLED ALUMINUM IS USED IN THE HULL OF SEA WATCH VESSELS.

For the developers of **Clearbot**, the inspiration to be involved in removing trash from waterways arose from personal experience. They had watched villagers in India catching fish in rivers carpeted with trash and surfers in Bali manually hauling in trash from otherwise beautiful beaches.

Samyuktha Sriram, Head of Business Development and Marketing, recounts how, with no common language between them, the Clearbot team was able to teach an Indian villager how to use its boat's remote control to clear around 80kg of trash an hour. "We designed the system to be as intuitive as possible. Operating the boat is almost as simple as using a remote-controlled device, but with far greater impact."

As for the surfers earning a living doing the arduous and dangerous work of manual cleanup of beaches, she says: "We don't want to put people out of jobs. We want to build a very usable solution that anyone can learn, so that they can continue to do the work that they do, just at a larger scale."

The company was started by university students Sidhant Gupta and Utkarsh Goel in 2019, and the partners built their first prototype in the hotel they were staying at in Bali and tested it in a swimming pool. Now they have offices in Hong Kong, India and Thailand.

Development has continued, and they have added a larger model capable of handling 200kg of trash an hour and storing 1.5 tons onboard. They have also installed solar panels so the vessels are self-charging, and they have bolstered vessel autonomy with the development of in-house object avoidance software. Onboard cameras provide a record of the trash collected, and in-house AI modelling classifies the trash for analysis by local authorities.

Clearbot has also partnered with **Lloyd's Register** to help meet the national and international standards that will facilitate their boats' entry into more countries and more markets. Sriram highlights the versatility of the collection system which can also clear aquatic pests such as water hyacinth. The small autonomous vessels can be useful in other hazardous environments too. They have been used to survey the dark, narrow waters under a bridge that was under construction.

The addition of water quality sensors and samplers offers more functionality as does bathymetric survey equipment or even storage space for marina deliveries. As multi-functional units, the boats are modular and can be converted from one operation to another in less than an hour.

Michael Arens, co-founder of **Clean Earth Rovers** in the US, adds the cleanup of dead fish to his vessel's extensive versatility. Red tides in Florida, for example, have causes mass deaths that pose a health hazard to those involved in manual cleanup. With a series of attachments, the company's rovers can collect dead fish, spray herbicides or clean up oil. A simple two-prong automotive plug is used for the various attachments which plug into the vessel's charging port.

For Arens, the motivation for developing the technology is to be part of the community and environmental stewardship that is fostered around marinas. "We like to work with groups, both in the private and public sector, to help leave behind a legacy of sustainability."

For **RanMarine** founder Richard Hardiman, the inspiration

TRASH CLEANUP BOATS

Source RanMarine

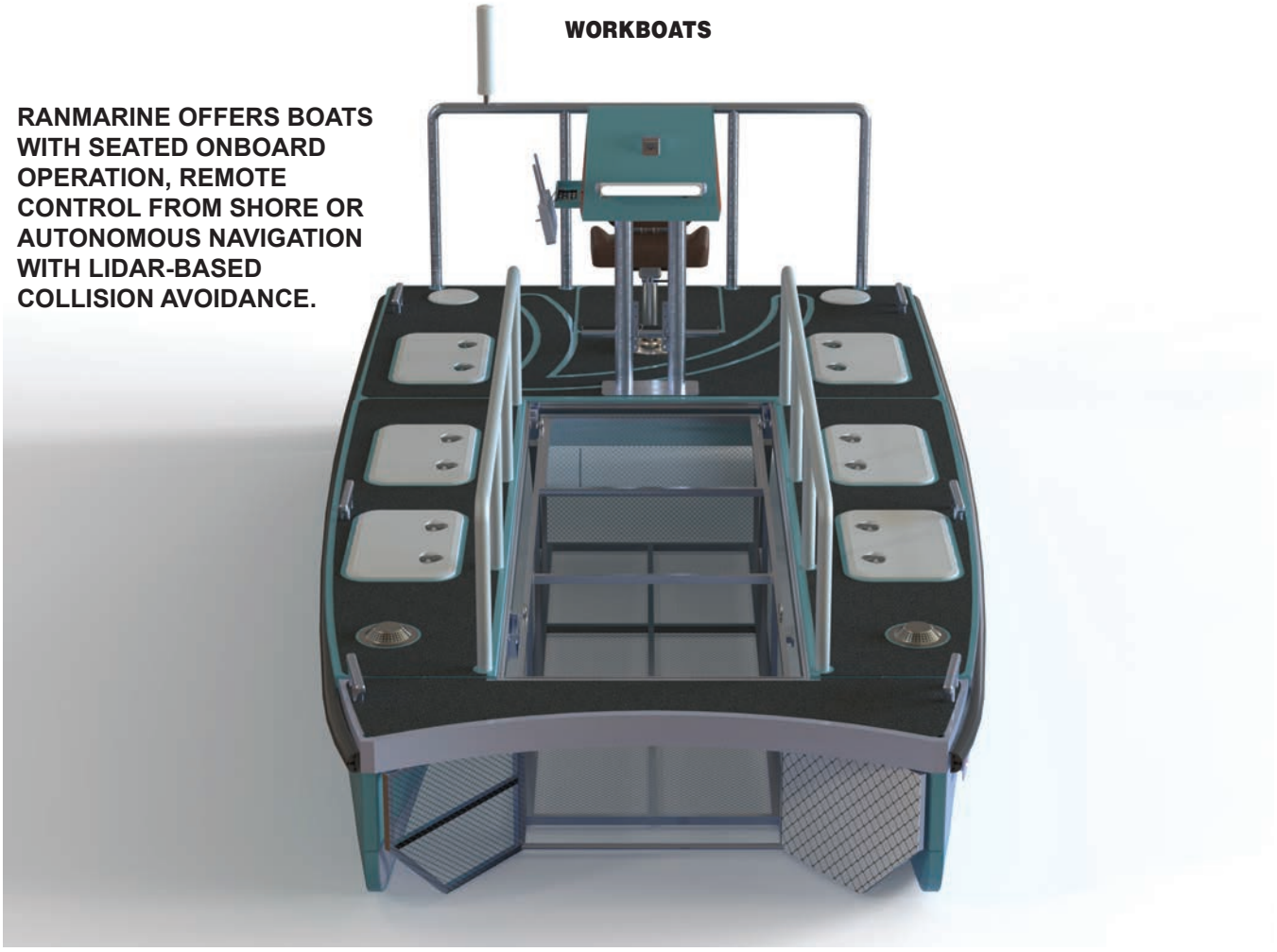
came as he watched a boat crew cruise around a waterway in South Africa scooping up trash with a net better suited to cleaning a swimming pool.

Rotterdam-based RanMarine now counts **Disney World,** the **Hudson River Park, PortsToronto, Babcock Marine Naval Bases UK** and the **Port of Houston** amongst its clients. The company's latest generation of boat offers seated onboard operation, remote control from shore or autonomous navigation with LiDAR-based collision avoidance.

Rather than just being part of a reactive, cleanup operation, Hardiman has a strong focus on proactive pollution control through the gathering of real-time water quality data. This data feeds into impact reports that can inform management decisions and update regulators and the public on proactive pollution mitigation efforts. The collected data can establish baselines, identify temporal changes in water quality and waste accumulation and be used to encourage collaboration between local communities, harbor authorities and environmental agencies.

Water Witch's director Jackie Caddick has added another dimension to environmental stewardship. The UK-based company has over 90 vessels in service worldwide including in Hong Kong, New York, Cape Town, Kuwait and London, and a key feature is the aluminum construction of the vessels. Up to 70% of the aluminum used has been recycled. Aluminum is a great example of a circular product, says Caddick, as it retains its financial value. Aluminum is lighter and has a longer lifespan that steel, fiberglass or plastic, so the boats easily last 30-40 years, leading to a low whole-of-

RANMARINE OFFERS BOATS WITH SEATED ONBOARD OPERATION, REMOTE CONTROL FROM SHORE OR AUTONOMOUS NAVIGATION WITH LIDAR-BASED COLLISION AVOIDANCE.



Source RanMarine

Source RanMarine

life carbon footprint.

The vessels are powered by electric drives supplied by **Torqeedo**, and Caddick points to the importance of electric propulsion as more and more clients work towards net-zero emissions by 2030. "Electric propulsion is advancing fast, and by concentrating on building 100% electric systems, not just the motor but all onboard equipment, and from environmentally friendly, sustainable materials, we are able to offer a unique design."

The company's latest design includes **Marine AI's** autonomous software solution: GUARDIAN. GUARDIAN Vision provides human-in-the-loop object detection and classification, and the AI functionality can provide a COLREG-compliant level of control using the Guardian AUTONOMY software suite.

GUARDIAN's advanced data analytics enable full automation of the cleanup process and optimize the retrieval of marine litter and ocean plastic. The detailed data captured by GUARDIAN gives insight into the location and predicted movement of plastics, the variations and density of any hotspots and the characteristics of the litter. The AI technology uses monitoring, modelling and machine learning capability to increase recovery capacity, endurance and the cost-efficiency of the cleanup process.

"Over 90% of marine debris reaches the ocean from rivers," says Caddick. "By reducing the flow of plastics and waste in our inland waterways rivers and estuaries we can really make a huge difference."

Source Clearbot

Source: ABC Engines

WORKBOAT ENGINES:

FLEXIBILITY IS THE FUTURE

Vessel owners are making new fuel choices, but increasingly, they have options to help reduce the risk of doing so.

By Wendy Laursen

In September, ABC Engines launched its Evolve 8EL23 engine, completing its range of engines that can operate on a range of fuels.

The latest engine developments aim to make it easier for owners to avoid the chicken-and-egg fuel price and availability risks of new fuels.

As Roger Holm, President of **Wärtsilä Marine** and Executive Vice President at Wärtsilä Corporation recently pointed out, the challenge is that owners won't commit to a fuel today that is expensive, only produced in small quantities and may be usurped by another fuel that scales faster and more affordably. Meanwhile, it is difficult for suppliers to scale production without clear demand signals.

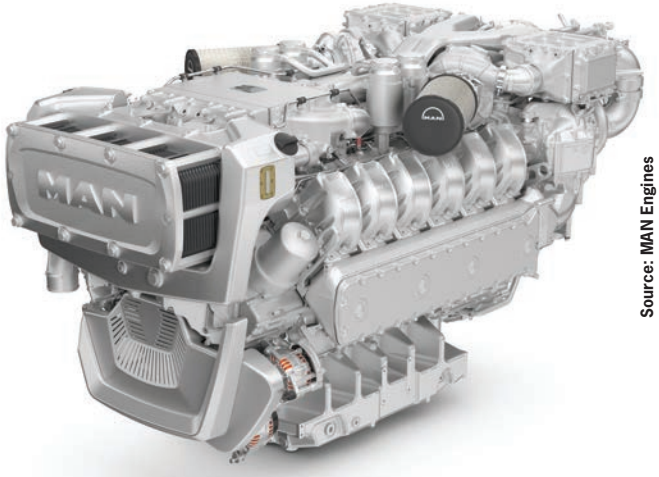
The problem is particularly pressing for vessels that are reliant on what fuels are available in particular ports, and some of the pioneering efforts are occurring in major bunkering hubs.

In May this year, JMS Sunshine, the world's first LNG-powered tug (with two 16-cylinder **MTU** gas engines) entered operation in Singapore. Singapore's first LNG bunkering vessel, FueLNG Bellina, commenced operation in March 2021, and in December 2023, Singapore welcomed its first methanol bunkering vessel.

Also in May this year, the world's first methanol-powered tug, Methatug, entered operation in the Port of Antwerp-Bruges (powered by 8-cylinder **ABC** engines). Hydrotug 1, the first tug to run on hydrogen (with V12 dual fuel engines from **CMB.TECH**) is already operational there.

Source: MAN Engines

The new 30-liter 2,200hp engine from MAN Engines can be combined with a modular SCR to meet EPA Tier 4 or IMO Tier III standards.



Source: MAN Engines

MAN Engines has increased its range of engines for light, medium and heavy-duty marine applications with the launch of a new D3872 V12 engine.

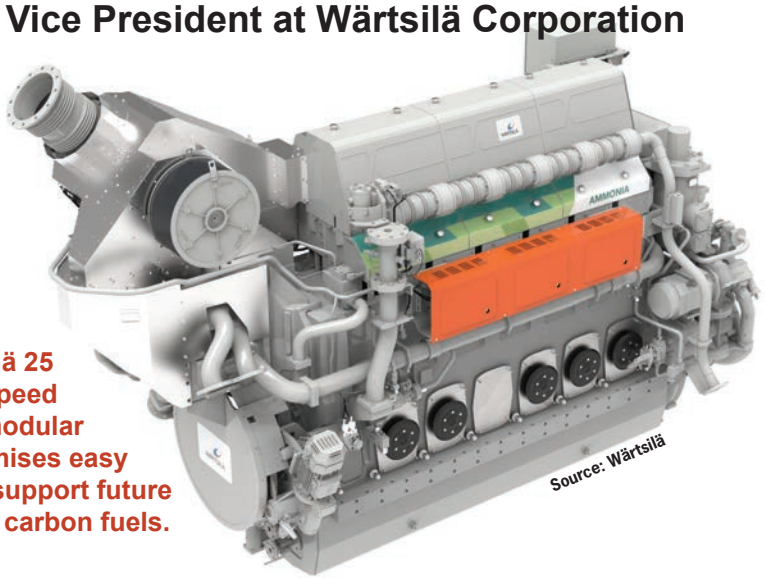
In May this year, JMS Sunshine, the world's first LNG-powered tug (with two 16-cylinder mtu gas engines) entered operation in Singapore.

Source: MTU

Source: Wärtsilä

"Investing in fuel flexibility is the most financially viable way to avoid the risk of stranded assets."

– Roger Holm, President of Wärtsilä Marine and Executive Vice President at Wärtsilä Corporation



Source: Wärtsilä

The Wärtsilä 25 medium-speed 4-stroke modular engine promises easy upgrades to support future low or zero carbon fuels.

Government funding and regional regulations are playing a part in generating change. The Norwegian government, for example, has announced that it will establish requirements for zero emissions from new supply vessels from 2029. Pioneers are active there. Wärtsilä recently signed a contract with Norwegian shipowner Eidesvik to supply the engine equipment for the conversion of a PSV to ammonia fuel. The Viking Energy, which is on contract to Equinor on the Norwegian Continental Shelf, is scheduled for conversion in early 2026.

The three companies have a history of collaboration and innovation. Using Wärtsilä dual-fuel engine technology, Eidesvik became the owner of the world's first LNG-powered PSV back in 2003.

A 2024 report by Wärtsilä estimates that fuel efficiency measures can cut shipping emissions by up to 27%. However, sustainable fuels will be critical to eliminating the remaining 73%. Holm noted at the time that achieving net zero in shipping by 2050 will require decisive policy and industry collaboration, and the report states that the EU Emissions Trading Scheme and FuelEU Maritime Initiative will see the cost of using fossil fuels more than double by 2030. By 2035, Wärtsilä predicts these regulations will close the price gap between fossil fuels and sustainable fuels.

However, even with price parity, availability risks remain, and OEMs are supporting owners on this front with fuel-flexible engines. "Investing in fuel flexibility is the most financially viable way to avoid the risk of stranded assets," says Holm. Wärtsilä's latest engine type, the Wärtsilä 25, is a medium-speed 4-stroke modular engine that promises easy upgrades to support future low or zero carbon fuels as they become available.

Other OEMs are offering solutions.

In September, **ABC Engines** launched its Evolve 8EL23 engine, completing its range of engines that can operate on different fuels thanks to a versatile cylinder head design which allows for straight-forward conversion between liquid, dual and gas fuels.

In June, **Bergen Engines** announced that its natural gas engine can burn a 25% hydrogen blend without modification. This builds on the successful commercialization of a 15% hydrogen blend option in 2022. The OEM aims to have a 100% hydrogen-fueled engine by the end of the year.

Despite the technology advances, new fuel availability is likely to be a concern for some time yet. A study released in June 2024 by Transport & Environment (T&E) states that 4% of European shipping could run on e-fuels by 2030, but just a third of the projects to supply the fuels are guaranteed, as fuel suppliers fear a lack of demand.

In May this year, the world's first methanol-powered tug, Methatug, entered operation in the Port of Antwerp-Bruges.

Source: Port of Antwerp Bruges

Biofuels such as HVO and FAME are an already-available option for an increasing number of engines. Bergen Engines announced in May that its B33:45 engine has received formal approval for operation on blends or 100% HVO.

However, NOx regulations mean that hydrocarbon engine OEMs are also focusing on aftertreatment advances.

MAN Engines has increased its range with a new D3872 V12 engine. The result is that in-line six-cylinder, V8 and V12 engines from 221 to 1,618kW (301 to 2,200 hp) with a displacement of 12.4 to 29.6 liters are currently available for light, medium and heavy-duty marine applications. The new 30-liter 2,200hp engine can be combined with a modular SCR to meet EPA Tier 4 or IMO Tier III standards and optionally a particulate filter to meet EU Stage V standards. The OEM says the SCR also reduces fuel consumption by 3-8%.

Volvo Penta has expanded its range of D8 IMO III solutions aimed at smaller, high-speed commercial vessels. The new solutions feature six-cylinder, 7.7-liter diesel engines that can provide power up to 405kW and generate up to 550hp. The associated SCR technology has been optimized for heavy-duty operations and can be installed in either a vertical or horizontal position.

In September, **MAN Energy Solutions** announced a new common rail injection system for its medium-speed, four-stroke portfolio which the OEM says optimizes engine performance, emissions and fuel consumption. CR 2.2 brings an increased system pressure of up to 2,200 bar to enable it to comply with future emission limits while offering the best possible fuel consumption. It also acts as a platform for a broad variety of fuels including HVO and FAME.

With all these developments, OEMs are providing the equipment to reduce fuel consumption, NOx and CO2 emissions. Adding modularity and fuel flexibility, they are facilitating change to new fuels.

The Wärtsilä report indicates that every dollar an operator saves in fuel costs at today's prices could be worth 3-5 times that by 2030. So, says Holm: "Taking steps to improve fuel efficiency and invest in fuel flexibility can deliver immediate returns, reducing both emissions and operating costs. But action must be swift – we have the lifecycle of just a single vessel to get this right."

Source: MAN ES

MAN Energy Solutions has released a new common rail injection system for its medium-speed, four-stroke portfolio.

T-ATS 11 is seen here under construction at Austal USA in Mobile, Ala.

Source: Austal USA

NEW NAVY TUGS

BUILDING ON GULF COAST

By Edward Lundquist

The Navy's newest class of ocean-going tugs are under construction at two yards on the Gulf Coast.

Ten ships of the Navajo-class are being built at Bollinger of Houma, La., and Austal USA of Mobile, Ala. They are designated as towing, salvage and rescue ships (T-ATS), and will be operated with civilian crews by the Military Sealift Command (MSC). They will serve as replacements for the Safeguard-class of rescue and salvage ships (T-ARSs) and the Powhatan class of ocean-going tugs.

Navy officials said that the new class of tugs "provide ocean-going tug, salvage, and rescue capabilities to support U.S. fleet operations and will be a multi-mission common hull platform capable of towing heavy ships."

According to the Bollinger Shipyard website, "The Navajo-class is a new series of towing, salvage and rescue ships (T-ATS) being constructed for the U.S. Navy. The Navajo-class is a multi-mission common hull platform that will be deployed to support a range of missions such as towing, rescue, salvage, humanitarian assistance, oil spill response and wide-area search and surveillance operations using unmanned underwater vehicles (UUV) and unmanned aerial vehicles (UAV)."

The T-ATS will be 260 feet long and displace 5,100 tons. The ships have a significant amount of open deck space to install containers or equipment to support a variety of missions.

Like their predecessors, the T-ATS are named for native American nations or significant native American leaders.

According to a U.S. Navy Fact File, Bollinger Houma Shipyard is building the future USNS Navajo (T-ATS 6), Cherokee Nation (T-ATS 7), Saginaw Ojibwe Anishinabek (T-ATS 8), USNS Lenni Lenape (T-ATS 9) and USNS Muscogee Creek Nation (T-ATS 10). Bollinger laid the keel for Muscogee Creek Nation on March 21, 2024. Cherokee Nation was christened at Houma on June 13, 2024.

Austal USA was awarded a follow-on Detail Design and Construction contract for the construction of T-ATS 11 through T-ATS 15. Austal USA has begun construction of USNS Billy Frank Jr (T-ATS 11), USNS Solomon Atkinson (T-ATS 12), and USNS James D. Fairbanks (T-ATS 13), and is under contract for the detail design and construction of USNS Narragansett (T-ATS 14). Austal USA laid the keel for USNS Billy Frank Jr. on Nov. 14, 2023. T-ATS 15 is on order but its name has not yet been announced.

Future USNS Cherokee Nation (T-ATS-7) Navajo-class towing, salvage and rescue ship was christened at Houma, Louisiana on June 8, 2024.

Source: Bollinger Shipyards

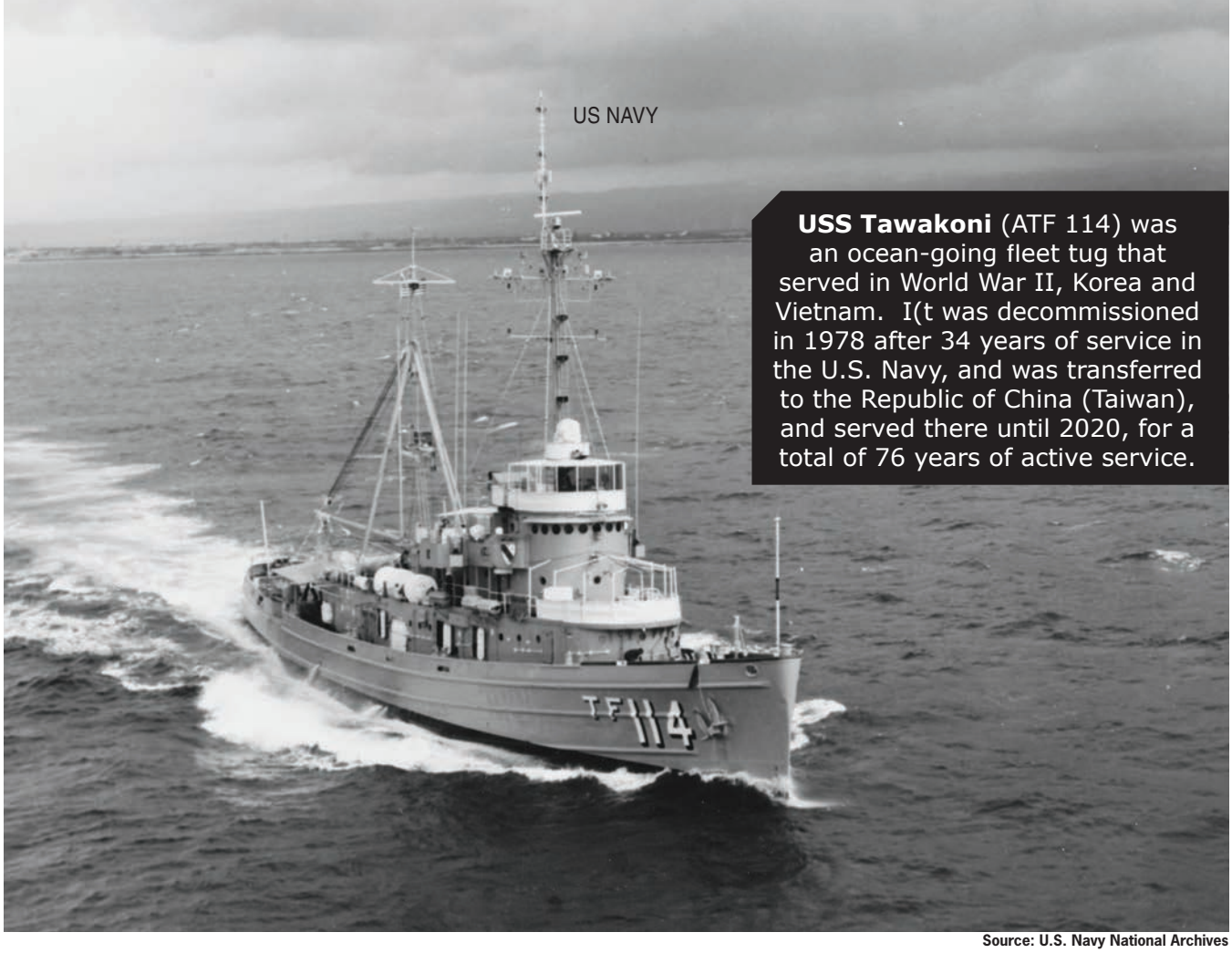
The *Navajo* class is a class of 5,100 ton towing, diving and rescue tugs for the U.S. Navy's Military Sealift Command of the United States Navy. They were ordered in 2017 to replace for the aging Safeguard-class rescue and salvage ships and Powhatan-class tugboats. A total of ten ships of the class have been planned and none have yet to be put in service. Seen here is the future USNS Billy Franks Jr. (T-ATS 11), under construction at Austal USA's Mobile, Ala., shipyard.

LEGACY SHIPS

The 205-foot, 1,600-ton pre-WWII Navajo-class began construction in 1940, and 76 ships of this class were built throughout the war. The lead ship (USS Navajo (ATF 64)) and second ship (USS Seminole (ATF 65)) were wartime losses, so the class name reverted to the next ship in the class, (USS Cherokee (ATF 66)). Several were delivered after the war ended. Some were converted for Coast Guard use or as submarine tenders. Later versions of this ship had slightly different propulsion arrangements, and are sometimes know by different class names. Many were reengined in their later life. Many were transferred to foreign navies, and a few still serve today.

The World War II-era Diver and Bolster class ARSs served up until 1994. They were succeeded by the four ships of the Safeguard class, which were built to operate with Nay crews to conduct towing, diving, salvage and rescue operations, but subsequently transferred to MSC and operated by civil service mariners and active Navy salvage and diving teams. They were constructed at Peterson

Navajo class towing, salvage and rescue ships (T-ATS)	
Displacement	5,110 long tons (5,190 t)
Length	263 ft (80 m
Beam:	59 ft (18 m)
Builders:	Bollinger Shipyards, Lockport, La.; Austal USA, Mobile, Ala.
The initial T-ATS contract was awarded to Gulf Island Fabrication, which was subsequently acquired by Bollinger Shipyards	
Gulf Island Fabrication	
Navajo Nation	T-ATS-6
Cherokee Nation	T-ATS-7
Bollinger Shipyards	
Saginaw Ojibwe Anishinabek	T-ATS-8
Lenni Lenape	T-ATS-9
Muscogee Creek Nation	T-ATS-10
Austal USA	
Billy Frank Jr.	T-ATS-11
Solomon Atkinson	T-ATS-12
James D. Fairbanks	T-ATS-13
Narragansett	T-ATS-14
Unnamed	T-ATS-15



Source: U.S. Navy National Archives

Builders of Sturgeon Bay, Wisc., between 1985 and 1986. Two of those ships—USNS Grasp (T-ARS 51) and USNS Salvor (T-ARS 52)--remain in service today.

Seven Navajo-class of T-ATFs were built between 1976 and 1981, based on commercial ocean-going tug design and intended to be operated with a civilian crew from the beginning. Just one, USNS Catawba (T-ATF 168) continues to serve in the fleet tug role. One ship of the class, USNS Narragansett has been redesignated as a training support vessel (TSV-4), serving as a target towing vessel for at Joint Expeditionary Base Little Creek/Fort Story in Virginia.

Three Edenton-class consisted of three towing and rescue ships, where they were brought into service in the 1970s. The lead ship in the class was converted for Coast Service as the USCGC Alex Haley (WMEC39), and serves today as a medium endurance cutter based in Kodiak, Alaska. Two of the ships were transferred to the Republic of Korea Navy.

"Cybersecurity is a Hoax" and other Maritime Misconceptions

*Watch the full interview with **Angeliki Zisimatou**, Director Cybersecurity, ABS on Maritime Reporter TV:*

MARITIME REPORTER TV

Cyber Security to the Fore as New Coast Guard Rules Loom

*With new rules on Cyber Security coming down from the U.S. Coast Guard, **Angeliki Zisimatou**, Director Cybersecurity, ABS, discusses maritime cyber security in the round, with insights on what the new rules could mean for vessel owners.*

By Greg Trauthwein

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Cyber security and all that it entails is quickly climbing the priority ladder in maritime, as increasing dependance on connectivity is a double edge sword of promise and peril.

While the level of cyber security preparedness varies widely across all industries, perhaps the biggest concern is that some don't even acknowledge the risk. "Many times over the last eight years I've heard 'Cybersecurity is a hoax'; I've heard that again and again from crews, from operators, from owners," said Angeliki Zisimatou, Director Cybersecurity, ABS, as they believe that their onboard systems are 'air-gapped' from onboard connectivity, leading to a false sense of security.

Step one for ABS is to inform, educate and illustrate that yes, the threat is real. Just ask A.P. Moller-Maersk Group, one of the world's largest shipping companies which in 2017 was hit with the NotPetya attack, disrupting operations for 10 days and costing hundreds of millions in revenue.

While maritime collectively has been slow on the cyber security uptake, Zisimatou said large fleet owners and operators are taking the risk seriously – investing heavily in their own secure operation centers – and she is starting to see attitudes change across the industry, particularly when high profile events like NotPetya grab headlines and illustrate the potential scope of the problem. A driver too, per usual, are emerging rules from the International Maritime Organization and the US Coast Guard.

"For the smaller- and the medium-size operators and owners, I think that regulation is what is driving their actions, so they try to stick to the bare minimum, doing what is mandated or recommended," said Zisimatou.

FILLING THE GAPS

As new, connected vessels increasingly come on line, and a newer generation of seafarers – online natives – increasingly take command of the maritime space, cyber security awareness and action will follow in step. Until then, much work remains.

"Lack of knowledge on the topic, [plus] the lack of training and awareness; that applies to the crews and to onshore personnel," is arguably the biggest gap today, said Zisimatou.. "Even shipping companies that know they need to act, they might assign the task to their IT department, and typically, IT personnel have [little or no] knowledge of onboard systems," presenting a challenge on where to start.

The antiquity of legacy systems running onboard existing tonnage, including Windows NT and other outdated software, poses an equally big challenge in terms of vulnerability.

Another potential problem throughout the whole of the maritime supply chain possessing adequate visibility on maintenance and upgrade of onboard systems, as typically vessel owners and managers have vendors physically come onboard to access and upgrade systems, providing little if any visibility on what has actually been updated and installed on the ships. Getting complete control and visibility on critical system updates and maintenance is yet another priority item on an vessel owner/manager's 'to do' list.

But while the gaps and problems are potentially large, the solutions can be easy, at least to start.

"I would start with the obvious," said Zisimatou. "First of all, take it seriously. Consider it an actual risk to your operations and to your business. Follow what is mandated, or what is recommended by IMO, what is recommended by NIST, cybersecurity framework. Follow the steps. Start with a very robust risk assessment, and put the right people in the room; people from operations and people from the IT side. Brainstorm; really think of the risks and how to mitigate them. If your identification of risk is poor, the controls that are going to be implemented are poor as well."

NEW COAST GUARD RULES

Earlier this year, the Coast Guard published a proposed rule in the Federal Register proposing to update maritime security regulations by adding regulations specifically focused on establishing minimum cybersecurity requirements for U.S.-flagged vessels, facilities on the Outer Continental Shelf, and U.S. facilities subject to regulations under the Maritime Transportation Security Act of 2002. The new rules are expected to be finalized later this year, and many questions remain on what they will mandate, and how it will ultimately impact vessel owner/operator procedure and cost.

"We provided some feedback to the Coast Guard as far as to what is potentially missing, or potentially is going to be challenging for the operators," said Zisimatou. "[At this time] we don't really know whether the new regulation is going to apply to new construction vessels, or to existing vessels, too. That would have a huge impact to U.S. flag vessels." She said there are some requirements within the proposed rule which talk about segmentation of networks, for example, and especially in existing vessels, where the networks are typically flat, "that would require some extra effort."

But it doesn't end there.

"There are other items as well, like cybersecurity drills every three months required within the regulation, which we think is a little too frequent," said Zisimatou. "Then there are no specifics; what does it mean, what needs to be tested?"

She said the classification society has recommended that the Coast Guard take into consideration what IACS has proposed as far as new construction vessels, how to address the whole supply chain, from the design, commissioning, construction, and operational life of a vessel, but also how it has approached the specific controls, providing a bit more clarity on what class needs to do, what owner needs to do, what a shipyard needs to do.

"I'm waiting to see the regulation coming out, and I'm sure that the Coast Guard has received plenty of comments that they're working on right now," said Zisimatou. "I'm eager to see that, and then I think it's going to have a huge impact, especially [later on when] more regulation come out from other flag administrations, based on what the Coast Guard has set out."

Shipping Conundrums, from the Red Sea to China *[& beyond]*

*While in Hamburg, Germany for SMM, we had the chance to visit with **Martin Kroger**, CEO, German Shipowners' Association, an organization with nearly 300 member companies and 1,800 ships under its banner. It was a targeted discussion on the topics driving Germany shipowners today, from decarbonization, ship security and the Houthi's firing rockets and drones at commercial ships in the Red Sea.*

By Greg Trauthwein

How much is decarbonization impacting your shipowners today?

Shipping is moving quite fast towards 2050, when all of international shipping is supposed to become carbon-neutral. We are pretty clear in German shipping: without a decarbonized fuel, without a fuel that is produced in the green way and that doesn't emit any CO_2 emissions when it's burned, we won't decarbonize. Energy efficiency [only brings you] a little closer to decarbonization. You may sail slower, you have a new propeller; but it will only bring you so far. So far we are on a reduction path of about 30% of CO_2 emissions; we are certain we can reach another 10%, but the last bit is the fuels … and that's the most difficult part, because we need a lot of fuel, as we burn about 300 million tons of fossil fuel per year in the international fleet.

The energy density of the fuels we use today is quite high, it's a good product that we burn, except the emissions. Compare it to hydrogen. If you would run a vessel today purely on hydrogen, you will only transport your fuel, you won't transport any cargo. That, of course, is not the solution. [Our concerns are many]: Where does the fuel come from? What kind of fuel do we have? How can we handle it safely on board with our seafarers? How do we get the quantity of the fuel that we need?

What do you see as some of the opportunities to get over these future fuel challenges?

Look at the liner companies on the container trades, their traffic is point to point. The liner companies are a special area of shipping, as they own about half of their own fleet, and the other half they charter in. We are looking at what they're doing with their own ships, the direction they are taking with the newbuilds. You see that methanol plays a big role at the moment for new ship orders. With ammonia, we are not there yet, because we don't have the ammonia ready engine on the market … yet. We expect that in the next two years. And then of course you

"The Houthi rebels are not just a freaky rebel group, they are a well-equipped army. **They went with helicopters onto a tanker, planted explosive devices and just blew the whole thing up.** *That's total craziness, but that gives you an idea of what threats we are facing."*

– Martin Kroger, CEO, German Shipowners' Association

have hydrogen, but energy density is an issue, so that's not going to be the fuel of the future. So it is methanol or ammonia.

Then there are the biofuels, which you will need as a bridge until we have methanol and ammonia ready in the quantity that is needed.

Let's switch gears. When you look at ship security, what's top on the agenda for your ship owners?

It's definitely the geopolitical tensions we see in the moment, led by the Red Sea crisis. For the time being, if you want your vessel safe and secure, the best alternative is to sail around Africa. It prolongs your journey for about two weeks, but at least your crew is safe, your ship is safe.

The Houthi rebels are not just a freaky rebel group, they are a well-equipped army. They went with helicopters onto a tanker, planted explosive devices and blew the whole thing up. That's total craziness, but that gives you an idea of what threats we are facing. My advice to my members: 'Please do not go through the Red Sea or the Suez Canal, because it's just too dangerous. We have naval vessels in the area, but its's just protection. If you really want to be safe and secure, just choose another path. That's not ideal, because you lose a lot of time, it costs a lot of money, but of course you also have a responsibility for your ship cargo and crew, and that basically forbids you to go through the Red Sea in the moment. What is the solution? I must admit, I don't know.

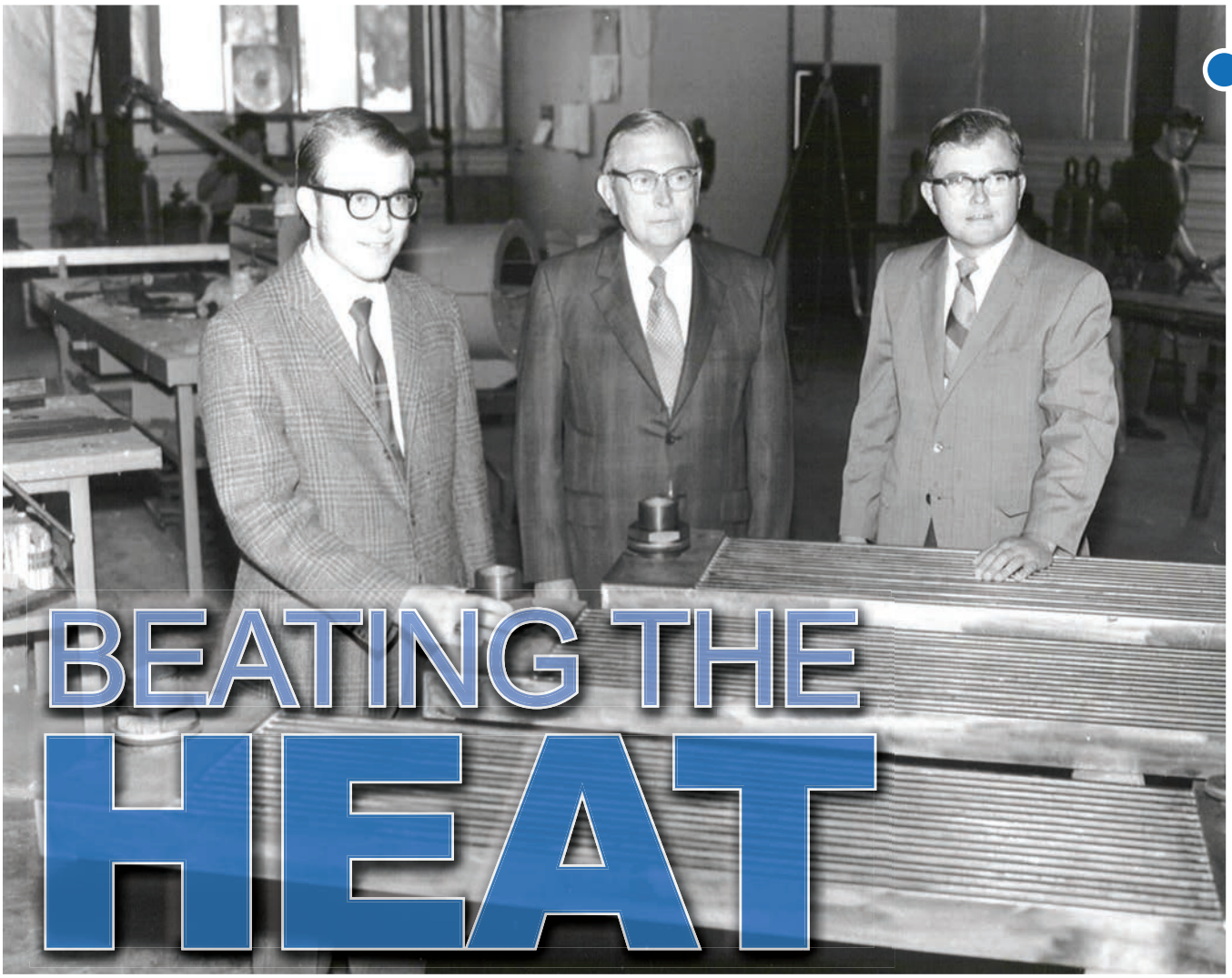
We are in close contact with security companies, militaries and navies that are active the area. But it is a large and complex conflict, because it's connected to the military conflict in Gaza, it is connected to the general tense situation in the Middle East, that there won't be a simple solution.

But it is not the only area in the world which causes problems. If you look at the situation in the South China Sea, and also the Strait of Taiwan, it's a huge worry for us. An even a bigger worry because much more is connected to that sea area, and also to trading partners like China for example, which plays a major role in shipping, shipbuilding and ship finance [not to mention] the country with the top 10 largest container ports in the world. China is huge in shipping, and that's why we need to take the situation seriously.

We learned our lesson with the war in Ukraine and the Black Sea, about how quickly sanctions impact shipping and shipping operations.

That is something you at least have to consider as you are planning your economic strategy as a shipping company.

All image courtesy R.W. Fernstrum & Company



BEATING THE HEAT

R.W. Fernstrum & Company, *founded by Robert W. Fernstrum 75 years ago, is a quintessential U.S. manufacturing story. The company was born in the aftermath of WWII, founded on an invention developed during the war by Robert Fernstrum to help solve an engine overheating problem that was plaguing U.S. Navy landing craft. Family owned and operated from day one, today the company includes a fourth generation of family that aims to continue the legacy of its founder,* **a legacy built on effective, efficient heat exchange.**

By Greg Trauthwein

Diversify, diversify, diversify … always, is the way that **Sean Fernstrum** summarized the challenge of running an efficient business to and through the many up and down cycles common in the maritime market. "You have to be in different markets. You try to ride an even line (with diversification)."

Paul Fernstrum, the son of the company's founder and Sean's father, will celebrate his 60th anniversary with the company and his retirement in 2025. In those six decades he has seen more than his fair share of ups and downs in the maritime market, but in his mind, there was no deeper trough than 1981.

"1981 … that's when the marine industry died in this country," said Paul. "Some called it a recession; I called it a depression. In January 1981 we had six months of work [backlog], 45 employees, a second shift and our shop was humming. By the end of January, I had two weeks of backlog because of all the

Left:
[L to R] **Paul, Robert W. and David Fernsturm.**

Right:
25 year ago Fernstrum celebrated its 50th anniversary: [L to R] **Sean, Paul & Todd Fernstrum.**

cancellations, and I had material coming in and no orders for it. We had to lay off many employees, and by the end of 1981, while we finally broke even, we were down to 13 employees. Our mantra then was *'Stay alive for '85!"*

Survive it did, and Paul said 1981 was a key pivot point for the company as – out of necessity – it started accepting unique, one-off design and manufacture projects. "I'd go to talk to the machine shop to see if I could beg them to build it, and they would machine it because they were hungry too. We started doing one-of-a-kind products, and today, we can build one-of-a-kinds and make money."

Today that diversity in product and application – the ability to design and build one-offs – is the mantra for R.W. Fernstrum & Company employees. R.W. Fernstrum's Gridcooler Keel Coolers are a standard bearer in the maritime and offshore energy business, but the applications to diffuse heat are many, and the company has a treasure trove of unique applications.

One was when it received a call in the mid-1970s from **Howard Hughes' Hughes Corporation** for a cooling problem it was having with electronics on the **Glomar Explorer**, a ship that was touted publicly as a seabed mining ship, but in reality it was involved in a secret government project to raise a sunken Russian submarine. Today, unique applications for R.W. Fernstrum heat diffusions solutions can be found everywhere, including:

- On emerging generation of wave energy devices.
- On experimental subsea computer server farms, placed on the seabed to manage cooling costs.
- On tsunami early warning buoys across the Pacific Ocean.
- In the space programs, on the self-propelled barge that moves the solid rocket boosters from Alabama to Cape Canaveral, and on the tugs that retrieve those boosters in the Indian Ocean.
- On electric boat designs to keep large banks of batteries cool.

"We're in a lot of different projects with a lot of different organizations … things you'd never imagine that we would have anything to do with," said Sean.

Looking Back

When he reflects on his 60 years with the company and the inclusion of his two sons, Sean and **Todd**; and his grandchildren, **Rachel** and **Jeremy** in the business today, Paul laughs as he said "I never thought I'd be in the company! There was a company in lower Michigan [that offered me a] starting wage of $1,400 a month. I mentioned that to my father, and he said, '*I thought you were going to come and work for us.'*

While going away sounded exciting, Paul said his decision to stay and join the family business was the right call. "I made the right choice," said Paul, even though his starting offer was $700/month, half of what the other company was offering.

Paul became the third employee in the company, and as is the case in small companies, he wore many hats: from janitor to secretary to draftsman, as well as being the company 'gopher.' "When anybody needed something, I had to go for it," Paul said.

Understanding a company's history, particularly when it is a tightly held family run company, is often a good window into its future.

In the case of R.W. Fernstrum that would entail engineering acumen and a dogged pursuit of new opportunities.

"My father Robert Fernstrum started the business in 1949 when he moved back to his home town of Menominee, Mich., and started selling Gridcooler Keel Coolers," said Paul. "The origins of our product lines have been a foundation for our success." The Gridcooler Keel Cooler was developed to solve a cooling problem for landing craft during WWII. "My grandfather was the chief engineer at Gray Marine and Continental Motors during the war," said Sean. "Gray Marine built landing craft and needed to devise a compact closed-circuit cooling sys-

tem to meet the needs of a wide range of operating conditions. Existing cooling systems were far too large for landing craft, so Robert developed a solution on his own. His compact keel cooler was the prototype for what would become our Gridcooler Keel Cooler line."

As with any invention, the path to success is rarely straight nor short, and the pressure from the Navy to develop a suitable landing craft cooling solution was starting to frustrate the young engineer.

"My father was feeling pressure from the Navy with the landing craft problem. They needed a hull type heat exchanger, and the only thing that was available was round tube with slip joints; the Navy didn't want that," said Paul. "So he's in the pump shop on a Saturday and he has this tube in his hand and a mallet, and out of utter frustration he starts pounding on this tube and it becomes oval. I think I could even feel today the light bulb going off – that "Eureka" moment – as he found a way to have more tubes in a confined space."

"That first model was 8 tubes wide and 54 inches long from nozzle to nozzle; it was very small on landing craft. It proved to be a very sturdy type heat exchanger and the Navy liked it, so they ordered many units for landing craft, and eventually extended the size and types of vessels," said Paul.

Investing in the Future

Central to its future is continued investment in the company: facilities, equipment, products and people, "but not necessarily in that order," Sean said. "The investment in facilities and equipment are obvious, the investment in product and people perhaps not so obvious."

This investment has manifested itself also in a broadening of the traditional Gridcooler Keel Cooler line to include, among others, the WEKA Boxcooler, which was a development of Cees de Kwant in the Netherlands.

That early relationship with WEKA, in fact, was an impetus to modernize its manufacturing. *"Sean and Todd brought us out of the dark ages with the manufacturing,"* said Paul.

Todd Fernstrum studied electromechanical engineering at Michigan Tech, and initially he didn't realize that his future would be with the family business. An avid hunter, skier and snowmobiler, he knew he did not want to relocate south, and his summers during college were spent making money working in production at the family business.

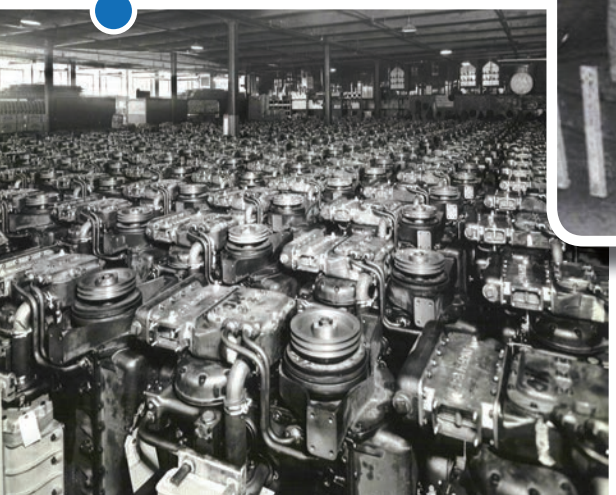
"Over time, I learned a lot about the processes, and I found my niche in the production area and R&D, using some of skills from my electromechanical side to develop some process controls in the shop. This included changing a lot of the processes, bringing in CNC machining and fabrication."

The impetus for this change came in 2001 "when we partnered with WEKA to start producing box coolers here for the Americas," said Todd. "At that point, we didn't have any in -house machining, and we were looking at having that done outside." Todd led the charge to bring in that first CNC mill, which at the time appeared well suited for future growth. "But things just keep getting bigger and bigger" and the heat loads grew, too, so it added another machine last year, and is eyeing additional production equipment to make the processes even more efficient and effective.

"In the last few years, about $3 million of new equipment has hit the floor," said Todd, "but we're already at the point where we're starting to think about upgrading and replacing some of these machines to help increase capacity."

Crew of an early test boat.

Rows of finished marine engines, Gray Marine.



All image courtesy R.W. Fernstrum & Company

Paul Fernstrum

Sean Fernstrum

Todd Fernstrum

Rachel Fernstrum-Millard

Jeremy Fernstrum

A Tier Change

A big driver for its business is regulation. According to Sean's son **Jeremy Fernstrum**, the continued move toward emissions reduction across the maritime world has put engine cooling solutions front and center, as cooling is essential in the process to pull out particulate matter and help cut back on greenhouse gasses. "For us, we are seeing less water but we have to reject more heat … a real double whammy," Sean chimed in.

When comparing comparable engines built in the 1990s versus today, that same engine will require significantly more heat exchange, essentially resulting in bigger cooling units. "This is an area of change for use where we are investing in the product to innovate so that we are still cost effective," said Sean. As the coolers are getting larger, one option is to stack them. Two decades ago the company only did a few 'stacked' units per year, today it seems like every order is going to the stack tube to get them to fit on the vessel.

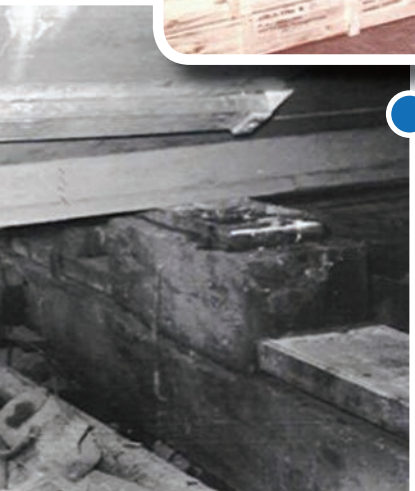
But those stacks can only get so big before inefficiencies start to creep in, which led R.W. Fernstrum to innovate – again – with the introduction of its larger tubing.

"The engine manufacturers have had to increase the temperature that they're running their engines because they have to burn that carbon out of their emissions," said Jeremy. "As a result, we're seeing a lot more heat; we're seeing some lower flow rates from some of these engines. That drove us towards to our new tube size, the E-size tubing, a higher capacity tube."

Whether the cooling challenge is WWII landing craft, an EPA Tier 4 [and beyond] engine, or stacks of battery banks on an electric vessel, Sean Fernstrum keeps his company focused on the mission at hand:

"Our strength is heat exchange. Whether it's cooling or heating, it is heat exchange. That's our core strength. We're serving that with a number of different product lines now, and we can bring those together and provide a packaged solution."

Boxed coolers for Navy, 1954.



Keel cooler on an early test boat.

Sean at shop construction in 1969.

Send in the Drones

To watch the full video with **DLS Marine** on MR TV scan the QR code:

MARITIME REPORTER TV

[to deep, dark & confined spaces]

DLS Marine received approval from ABS for remote inspection, and it is leveraging advanced drone + software tech to make the process of tank inspection more efficient and less dangerous.

By Greg Trauthwein

DLS Marine is a long-tenured name in the U.S. maritime survey market, founded by **Bob Stickney** as Stickney Marine Surveying in New Orleans in 1968, with a pivotal moment coming in 1977 when Stickney hired **Norman Dufour**, future DLS Marine Partner, as an apprentice marine surveyor. Today, in its 56th year, the company is 40-people strong and continues on the path set more than a half century ago, led by **Harry Ward**, who became the owner and president of the company in 2017. While the maritime business is generally cast as conservative and slow to change, DLS Marine is at the tip of the spear in one respect: **remote survey.**

The business of inspecting the structural integrity inside any hull has long been a dirty, dangerous and somewhat arbitrary business. Today, DLS Marine is moving forward fast with an investment in people and digital technology, the latter being state-of-the-art drones and software which helps to not only make the survey process more efficient and more safe; but it makes it more effective, too, providing the owner a better deliverable with more explicit, digitized information on the health of a vessels innards. According to Ward, a pivotal part of the DLS Marine journey into remote inspection via drone was the hiring of **Charles Sterling** – who previously ran his own consultancy and had done work for DLS Marine – in late 2023.

"Charles had his own consultancy and was doing a lot of work," said Ward. "He has a really strong IT background, which has become important through this entire process because we're evaluating software, we're helping to write software; so it's more than just flying a drone."

While the Sterling hire was pivotal, DLS Marine has been investing in and trialing remote survey effectively since Ward took the helm, or as he explains: "Putting a lot out and not getting much back … yet … like any early investment. We've been at this for six-plus years at this point, trying out drone technology and other digital inspection technology, and playing around with different software," said Ward. "But it's just in the last couple years that those things have started to mature to the point where they're really truly useful and can put out a good product."

To reiterate, conducting remote survey is more than simply flying a drone. Ward jokes that Sterling is starting to earn the moniker *"Maverick"* premised on all of the tight spaces he's able to fly the drones, but the business of remote inspection goes far beyond drone piloting. "The next generation will be more technology-centric. luckily for me I have an IT background so I know CAD, I know AutoCAD and CivilCAD," said Sterling, DLS' digital inspection director. "To have a good deliverable is to be able to mobilize, capture and attack the job; but sometimes you may have to come back and convert that to a CAD file for a customer," so while piloting the drone is important, just as critical is the back-end knowledge of the software to control it, as well as the systems to help output the deliverable if needed.

Put to the [Military Sealift Command] Test

DLS Marine recently completed a tanker inspection job for Military Sealift Command, a confined space inspection of ballast tanks, said Ward. "[Class] was on site and we were able to enter the tanks, which was 'GPS denied', meaning that the drone 'paints' the entire tank with a LiDAR."

"We were able to go in, get a LIDAR navigation and point cloud of the entire tank, and give very specific and up close high-resolution digital video and images of the entire tank while the classification team was watching, either inside or outside the tank, however they chose."

In addition to the LIDAR, the drone carried sensors to measure more than 20 different gases, and the tech is able to provide a deliverable within 1 to 1.3 cm of accuracy plus 4K video, said Sterling. "During the inspection, while we're flying, you can take a [a photo at a particular] point of interest. It puts it into the model, so when you're reviewing it in the portal you can see where that photo was taken in point of interest."

The class surveyors were in the tank a part of the time, "but it was warm, and with our ability to broadcast it on deck up top, they opted to stay up on top deck after that and watch it on TV. So they viewed it in real time while we were doing [the drone inspection] below deck."

Important too is the fact that the drone used was tethered for power and control, meaning there was no time limit or additional danger due to the use of lithium-ion batteries.

"With tethered power, there's no need to stop: if the tank was 100 miles wide, we could fly it for 100 miles," said Sterling. "We don't have to worry about batteries, which could be an issue in some tanks because lithium-ion is not a stable substance, and can be explosive. So we're going in there with a grounded tether."

Ultimately, the surveyors received a better deliverable more efficiently, a real-time, high-res data feed that not only can be watched outside of the tank, it can be beamed via the internet anywhere in the world.

"So theoretically at some point, let's say [a class] inspector could be watching this live from [their office] while we're doing the inspection somewhere in the world. It's exciting technology," Ward concluded.

Cut Shipyard Waste, by Design

Almacam is a leader in nesting-CAM software for shipyards. **Philippe Rouzeau**, *Manager of the Shipyard Team, Almacam, explains how it solutions can help shipyards shave production costs and increase efficiency.*

By Greg Trauthwein

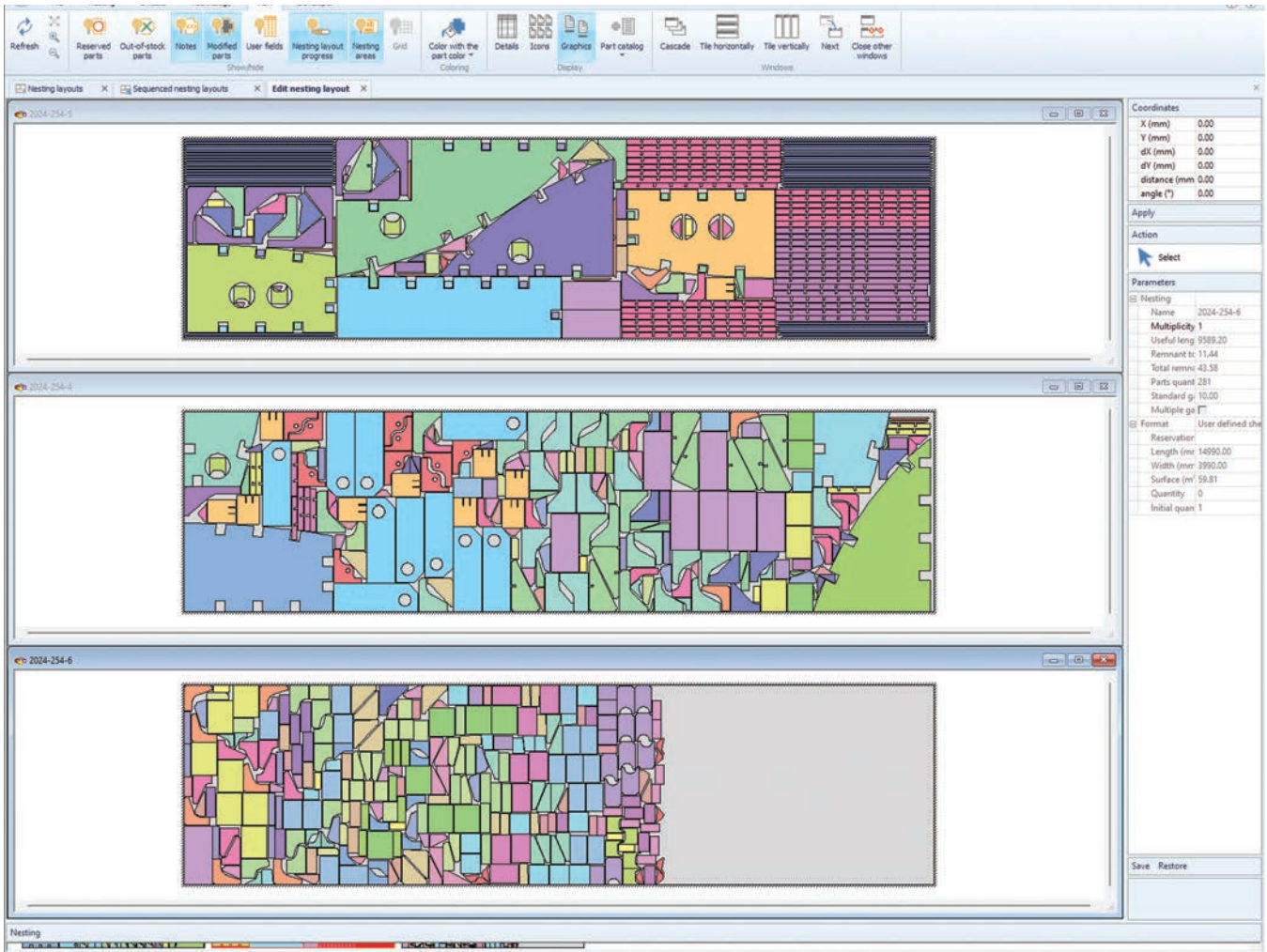
Almacam is a 45-year-old, employee-owned company created by researchers that were mono-focused on developing nesting algorithms in a laboratory of Grenoble University, France, aiming to bring this nesting algorithm tech to the industry.

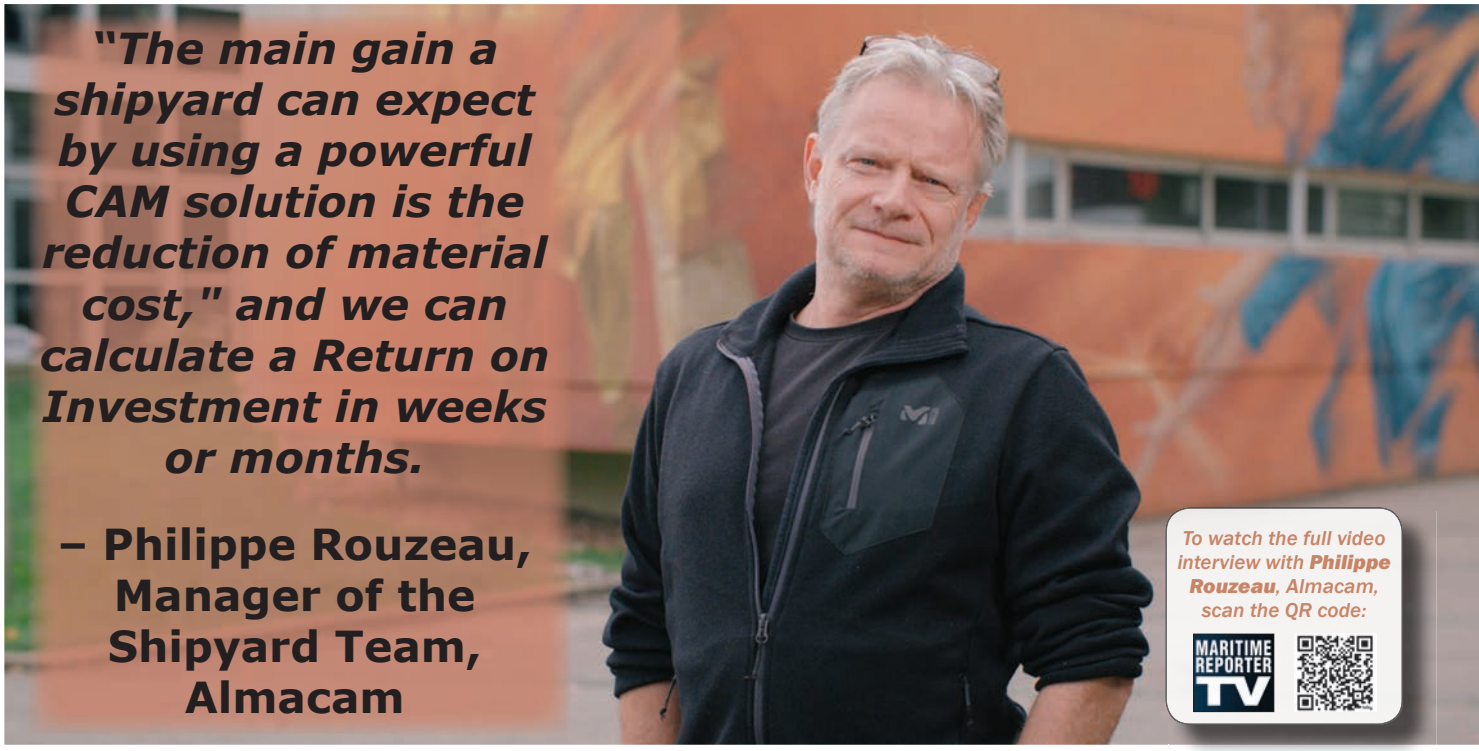
According to Rouzeau, it is the world's only independent CAD-CAM software publisher offering CAM solutions across industries, including aeronautics, agricultural equipment, steel construction, mechanical welding and, of course, shipbuilding and offshore construction.

Today the Alma Group has a nearly $20 million turnover, supporting 170 crew members and eight subsidiaries in France, Italia, Germany, Spain, Singapore, China, Brazil and the U.S. It works with 20 resellers and partners globally, with approximately 30,000 product licenses globally, a total which includes equipping 40 shipyards, with shipbuilding cumulatively representing approximately 20% of its overall market.

"I think the shipbuilding market is a bit conservative regarding modern technologies, but this can be easily explained," said Rouzeau. "First, the shipyard must keep and continue to use its CAM solution for the ships, or series of ships, that has been already built, sometimes for tens of years, for maintenance or traceability constraints. They cannot afford to use two CAD-CAM solutions for the same project. As a result, they adopt a new CAD-CAM solution when they launch a new project, and that does not happen every day."

But the main reason is that the adoption of the new CAD-CAM solution, however effective it may be, impacts a lot of people in the organization of a shipyard. "So the IT department is involved because he has to integrate with, or help, our CAD-CAM system inside their IT environment. The design, meaning the CAD department, is involved because





they are providing data for the CAM. The methods department is involved for the technical specificities linked to naval domain. And the workshops are impacted for the control of the cutting machine," said Rouzeau. "It is not enough to propose an innovative solution, even reducing material cost or controlling efficiently is the cutting machines. It is necessary to work with all these guys from all these departments, in order to integrate the CAM solution into the overall environment of the shipyard. And integration means communication with the different design or management systems, such like MRP, MES, or CAD system. And it means, also, to control, in the most automated way possible, the specific machine equipping the shipyard."

Rouzeau started working in more than 30 years ago, starting with Chantiers de l'Atlantique, which was Alma's first shipyard customer as they were looking for a nesting engine to reduce their material cost. "The shipyard market has always been a niche but very important market for Alma," said Rouzeau. "We have deployed our CAM solution into many big shipbuilders," including Fincantieri in Italy, Meyer Werft in Germany, Cochin Shipyard and Larsen & Toubro in India, and Bath Iron Works in U.S.

Today Rouzeau focuses on managing complex projects in the shipyard domain "from A-to-Z," starting early in the pre-sale stage to the final deployment and the start of production in the yard. "My role is to help shipyards to digitalize their process, and to integrate our Almacam solution in their environment."

Show Me the $

There is not a manufacturer in existence that shouldn't have 'cutting material cost' as a Top 2 agenda item, as controlling material cost and profitability walk hand-in-hand. Estimating actual material and cost saved is not easy premised on the fact that no two shipyards operate the same, but Rouzeau did offer guidance.

"The main gain a shipyard can expect by using a powerful CAM solution is the reduction of material cost, using parts coming out of a 1-in. (20mm) block as an example.

"For such a thickness, we may have, for one block, approximately 400 to 500 different parts with complex shapes to nest. This can lead to approximately 20 nesting in a standard sheet format of 10 x 4m," said Rouzeau. "We did several benchmark studies which showed that we can save one or two sheets among the 20, so it means a reduction of waste of approximately 10%. We cannot expect such wins on all thicknesses because the number of parts to nest can be much lower for different thickness. But if we take a 4% average wins ratio for a complete block, we can make a projection on a complete cruise vessel of 30,000 tons, for example. With a material cost of approximately $800 per ton, we can calculate a win in material cost between $900,000-$1 million," meaning the shipyard could effectively achieve a return on investment in a matter of months.

While material savings are tangible, additional benefits using optimization algorithms such as cutting-pass calculations can reduce machining time. "In addition, most of the time our solution is fully automated and can run in full batch mode," said Rouzeau. "So the programming time is also greatly reduced, and the risk of error, too. These are smaller than material wins, but they have to be considered in the choice of a new CAM solution."

All photos courtesy Blount Boats

BLOUNT BOATS TURNS 75

FROM A SIMPLE RAFT TO SMALL SHIPS

Blount Boats was founded by Luther H. Blount in 1949, celebrating its 75th anniversary in 2024. After building a small twin hull raft built of 55 gallon drums used for transporting oyster and clam shells across Narragansett Bay, he began receiving requests to build larger steel vessels.

Luther by nature was an entrepreneur and inventor. His first commercial boat was a 77-ft. steel catamaran which led to a bid he won to construct a fuel oil service vessel using the same catamaran concept based on two cylindrical floats which he dubbed the "twin tube." His design succeeded and was followed by a progression of larger and more complex monohull vessels in a quantum expansion of his Warren, Rhode Island shipyard.

From its modest beginnings to the present-day Blount Boats, Inc. designs, builds and repairs steel and aluminum, state of the art vessels up to 220 feet. Many types have been engineered at the shipyard such as passenger and vehicle ferries, stern trawlers, offshore supply vessels, dinner boats and small cruise vessels. In recent years Blount has built U.S. flagged crew transfer vessels for the wind farms off the east coast.

"As a third-generation business we are proud to keep our family tradition alive and well in this twenty-first century. Our team of highly skilled employees are the backbone of building small ships to fill the needs of our customers." State's Marcia Blount, President / CFO. "My sister Julie, who's the Executive Vice President / Human Resources and I are focused on our mission of superior workmanship, innovation and proven reliability to continue Blount Boats as a successful leader in the marine industry."

With more than 379 hulls and counting the Blount sisters work diligently to stay faithful to their mission with an earned reputation for building the "Taskmasters of the Sea."

75 Years and Counting

Blount Boats, Inc. is a full-service shipyard specializing in design, construction and repair of steel and aluminum vessels up to 220 feet. Founded as Blount Marine Corporation in 1949 by Luther H. Blount (1916-2006), the company is privately held and managed by the Blount family.

After Luther Blount built his first boat, a 77-ft. steel catamaran, he bid and won a job to construct a fuel oil service vessel using the same catamaran concept based on two cylindrical

floats which he dubbed the “twin tube.” This design was succeeded by a progression of larger and more complex vessels resulting in a quantum expansion of the shipyard. Blount Boats of note over the last 75 years.

- In the 1970’s Blount designed and built offshore supply vessels for the U.S. oil industry. The largest of these vessels at 192 feet long were equipped to carry 3,900 cubic feet of drilling mud in six tanks, 350,000 gallons of drill water and had a deck cargo of 640 long tons.
- The Le Bateau dinner boat, built in 1972, is believed to be the first to operate in the U.S., launching the excursion dinner boat segment of the cruise industry in America. During the 1980’s, a group of “Spirit Class” dinner boats were constructed with three decks designed for cruising major U.S. harbors.
- In the 1990’s, three small ship cruise vessels, each carrying up to 100 overnight guests, were built for Blount family sister company, Blount Small Ship Adventures (BSSA), a niche cruise operator. Blount designed and engineered retractable pilot houses to permit low bridge clearance, bow ramps to allow beach landings, and glass bottom boats.
- In 2016, Blount completed the first U.S. flagged crew transfer vessel for Atlantic Wind Transfers for service to Deepwater Wind. The shipyard is licensed by South Boats, IOW, UK for building offshore wind crew transfer vessels.

Watertight Door and Hatch Training

By Heather Combs, CEO of Ripple Operations and AdonisHR

These systems are designed to maintain a ship's integrity during emergencies and mishandling them can quickly turn a manageable situation into a catastrophe. Although no single training focus can cover all safety needs, ensuring that crew members are well-versed in the operation and protocols of both watertight doors and hatches plays a central role in the success and safety of any crew.

Many maritime accidents have been worsened due to improper management of watertight doors and hatches. Poorly maintained doors or hatches, leaving them open when they shouldn't be, or failing to operate them correctly in emergencies have been factors in several major incidents. Three such accidents serve as stark reminders:

- **MS Estonia (1994):** The sinking of the MS Estonia, where 852 lives were lost, highlighted the importance of managing watertight systems correctly. While the failure of the bow door led to rapid flooding, the disaster underscored the need for thorough training on all watertight compartments.
- **Costa Concordia (2012):** The mismanagement of watertight doors during the sinking of the Costa Concordia accelerated the flooding, leading to further loss of life. Had the crew properly managed these doors, it might have bought critical time for evacuation.
- **MV Derbyshire (1980):** This bulk carrier sank in a typhoon, killing all 44 crew members. A review pointed to failures in watertight systems, including hatches, and insufficient crew training as contributing factors.

Key Elements of Watertight Door and Hatch Training

For a ship's crew to be successful in maintaining safety, proper training in the operation and management of watertight doors and hatches must be a priority. According to experts at DNV, "Managing watertight doors as a safety barrier sounds like an easy, everyday task. However, it is indeed a highly complex operation involving technical systems, people, and processes." This complexity demands thorough and continuous training.

Here are the most important components of watertight door and hatch training:

1. **Understanding the Role:** Mariners must understand the purpose of watertight doors and hatches and their importance in maintaining the vessel's integrity. Different types of systems require different operational procedures, and crew members must be familiar with all systems aboard their ship.
2. **Proper Use and Closure Protocols:** One of the leading causes of accidents involving watertight doors and hatches is leaving them open when they should be closed, particularly during hazardous conditions. Training should emphasize when and how to properly close these systems to prevent the spread of water during emergencies.
3. **Emergency Procedures:** Crew members must be drilled on how to operate both watertight doors and hatches during emergencies. Simulating real-world scenarios ensures that the crew can respond under pressure and act swiftly if a door or hatch fails to close properly or flooding occurs.
4. **Regular Maintenance and Inspection:** Doors and hatches that are not properly maintained become liabilities. Training should cover how to inspect them for wear and tear and how to report any issues. Routine checks will ensure that these systems operate smoothly and are ready for emergencies.
5. **Safety Precautions for Operation:** Both doors and hatches can be physically dangerous if not handled correctly. Training must emphasize how to safely pass through and operate these systems during emergencies to avoid injury. For instance, passing through a door before it is fully opened or failing to heed alarms can lead to fatal consequences.

Integrating Watertight Door and Hatch Training

A proactive "door and hatch-closing culture" is essential. As described by marine insurer Gard, this means being prepared for possible events like collisions, groundings, or bad weather. Creating awareness of watertight door and hatch safety during safety meetings and officer conferences can ensure the crew knows how to respond and maintain vessel integrity in critical situations.

Ensuring that this training is ongoing and integrated into regular drills will make these procedures second nature to the crew. As part of a broader safety program, watertight door and hatch training is a key contributor to overall crew effectiveness and success.

Conclusion

Watertight doors and hatches are critical to the safety and structural integrity of a vessel, and proper training in their use is essential. While it may not be the only critical area of training, mastering the management of these systems is one of the most important steps a crew can take to ensure safety. By integrating this training into regular safety drills, you are not only complying with regulations but also enhancing the preparedness and success of your crew in emergencies.

Thank you for reading, and until next time, sail safely.

MARKEY MACHINE LOGS MULTIPLE RECENT CONTRACT WINS

McAllister Towing placed an order for series 240 JonRie Escort Winches to be installed aboard the tugs Vicki M. McAllister and Janet M. McAllister for a tug modification job. The **JonRie Series 240 Escort Winch** develops 15 tons of bare-drum line pull at 75 feet/min. line speed, with speed increasing to 150 ft/min. at mid-drum. The model accommodates 600 feet of 8.5-in. circumference synthetic line. Brake-holding capacity is a robust 300 tons bare-drum. Supplied with the winch is a skid-mounted HPU with a 60HP/460VAC electric motor. The HPU includes a counterbalance valve to prevent motor overspeeding; the unit has both a foot pedal and joystick for operation; safety features include an emergency-release button. The winches will be delivered in 2025.

McAllister Towing also recently ordered a Markey Machine winch and capstan for the fourth ASD tug of a class-build series being built at **Washburn & Doughty Associates**. Markey is providing a DEPCF-52-75 Class II bow hawser winch, which includes the Markey Render/Recover system, a line-display screen and a stainless-steel brake drum. A two-speed CEW-60 electric capstan is also included. Designed by Washburn & Doughty, Hull #138 is a 6770HP ASD tug measuring 93 feet by 38 feet. The new tug is scheduled for delivery in 2025.

Eastern Shipbuilding Group (ESG) recently won a contract to build four new escort tugs for **Saltchuk Marine's Foss Maritime.** The vessels will be built at ESG's Allanton and Port St. Joe facilities, in Florida, with delivery expected in 2026. The 84 x 42 x 14-ft. newbuilds will be RApport 2600 ship assist/escort tugs designed by Robert Allan Ltd. Each will be equipped with a Markey Machine DEPGF-52, 75HP, Single Drum Class II hawser winch

Master Boat Builders launched Patricia B. Moran, a new tugboat it is building for **Moran Towing Corporation**, based in New Canaan, Conn. The newbuild is one of two 86-foot (LOA) tugs the Coden, Ala. shipbuilder is building for Moran. Ordered in 2022, the tugs were designed by **Crowley Engineering Services** and will produce a bollard pull of over 55 metric tons. The vessel will features a Markey Machine bow winch (DEPC-48).

Gulf LNG Tugs — a joint venture comprised of **Bay-Houston Towing, Moran Towing Corp.** and **Suderman & Young Towing Company** — placed orders for four new escort tugs to serve the Port Arthur LNG export facility in Texas. Two will be constructed by Master Boat Builders in Coden, Ala., and two by Sterling Shipyard in Port Neches, Texas. The 92- by 40-ft. tugs feature a compact design providing increased maneuverability in ship handling and escorting through waterways and will offer a bollard pull capacity of more than 85 metric tonnes. Each will feature a Markey DESF-48-100 Electric Class III hawser winch, including a Render Recover feature for full bollard pull capacity.

REDUCING COMPLEXITY IN MARINE WINCHES WITH POWERTRAIN SOLUTIONS

By Jesse Dupuis, *Director of Powertrain Product Management, Regal Rexnord*

The Challenge:

An international engineering technology company that strives to develop unique, innovative, sustainable products for their customers needed assistance with designing a marine winch, which is a critical component in the marine industry. This component is used for the control, lifting, and retrieval of remote operated vehicles (ROVs) on sea/ocean fairing vessels.

The winch needed to lift a type of ROV called a hull cleaner, which is designed to remove fouling on the ship hull. This reduces the risk of transporting biological contamination across different zones, and improves fuel efficiency on the ship.

The company discovered they could not find a winch solution that met all their objectives on their own. They had an initial concept in mind but wanted help reducing its complexity and potential maintenance. By partnering with the Powertrain Solutions team at Regal Rexnord, they were able to eliminate components from their original concept, while meeting the tough demands of a seafaring application.

The Solution:

There were both physical and functional challenges to keep in mind when designing the marine winch. The physical needs of the winch were high corrosion resistance in the harsh salt spray environment, a simplified design to minimize potential failures and maintenance, and ensuring it was small enough to fit the limited enclosure size on the vessel. Functionally, the winch needed to meet the torque and speed requirements to have enough torque development to control, retrieve, and lift the ROVs, while also having dynamic braking to both let out more line for the ROVs and hold the brake to lock the line.

The Powertrain Solutions team partnered with the engineering technology company to come up with a design that significantly reduced the complexity, cost, and weight of their original concept, while increasing its robustness. The complexity was reduced by 58% by eliminating seven components, such as the synchronous belt, sheaves, belt guard, and flange mounted bearing, and by combining the motor, brake, and encoder into one Kollmorgen™ servo motor.

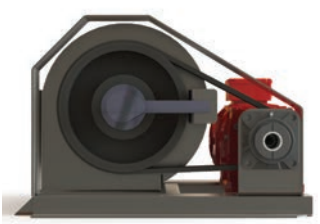
The Results:

In addition to reducing complexity, these changes reduced the cost of the entire winch system by 32% and its weight by 13%. Reliability and efficiency also improved by 3% and maintenance was reduced by removing the synchronous belt and sheaves, as they have a hard time standing up to the exposed saltwater environment. The Kollmorgen servo motor and drive with resistive load bank allows the customer to dynamically brake by dumping power to the resistor bank and hold statically via an integrated holding brake inside the motor. Multiplying the motor braking through the gearbox ratio allowed a much smaller braking solution than the initial drum winder shaft-mounted brake that the customer used, resulting in a significant cost reduction.

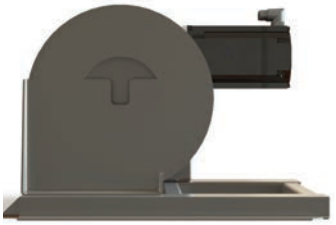
Images this page courtesy Regal Rexnord

COMPONENT COMPARISON

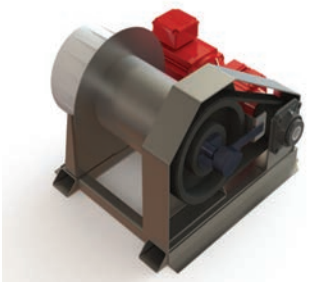
Existing BOM	Est. Price	Proposed BOM	Est. Price
VFD Control	$ 1,000.00	Servo Control	$1,900.00
Electric Motor (Induction)	$ 800.00	Electric (Servo w/brake & encoder)	$2,100.00
Concentric Gearbox	$ 1,200.00	Right Angle Gearbox	$3,300.00
Flange Block Bearing	$ 100.00	–	–
Driving Pulley	$ 290.00	–	–
Toothed Belt	$ 330.00	–	–
Driven Pulley	$ 830.00	–	–
Belt Guard	$ 300.00	–	–
Encoder	$ 600.00	–	–
Winch Frame	$ 2,500.00	Winch Frame	$2,000.00
Brake	$ 5,500.00	–	–
Assembly	$ 300.00	Assembly	$ 150.00
Existing BOM Total:	$13,750.00	Proposed BOM Total:	$9,450.00



Winch Application (Before)



Winch Application (After)



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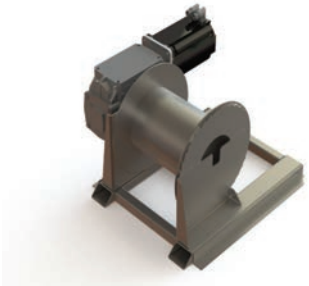
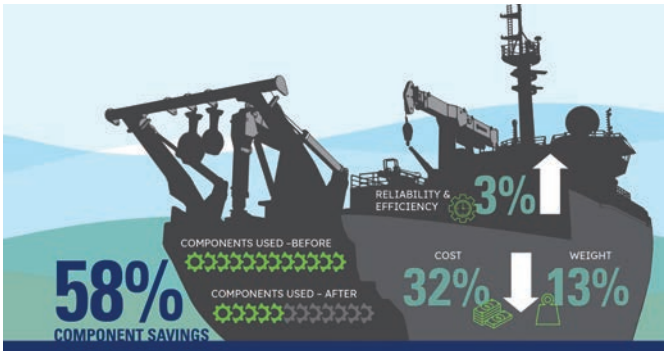


Winch Application (After)



Finally, the customer was able to eliminate one of the roller bearings and bearing mounts that support the drum winder shaft by rigidly mounting the gearbox and using the gearbox's overhung load capability to support the drum winder instead.

While the individual components in the proposed design have a higher upfront cost, having fewer of them results in an overall lower total cost solution. Additional benefits of the Powertrain Solutions winch assembly include:

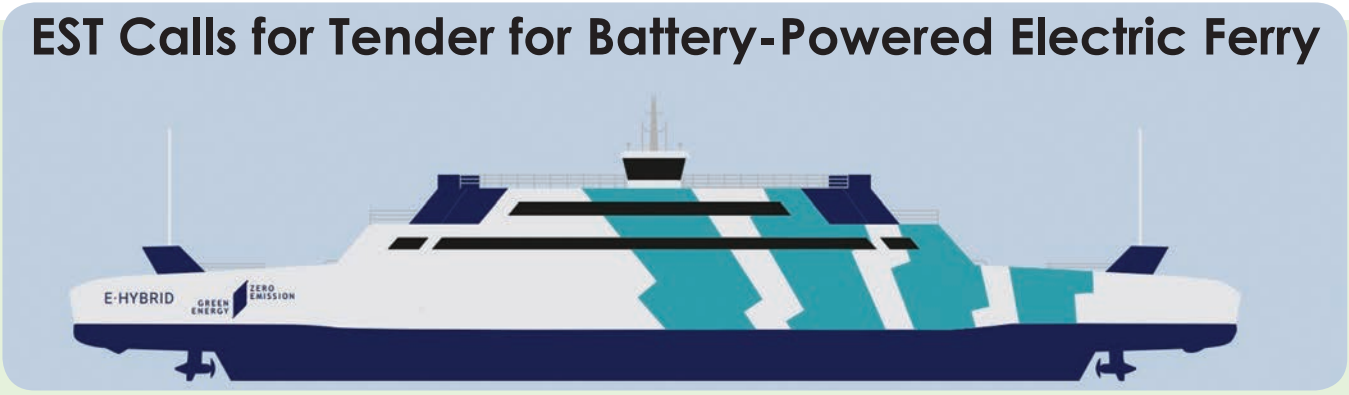
- Simplified assembly with fewer components resulting in a 50% reduction in time.
- Reduced processing costs, fewer logistics hassles, and one partner for the entire system by using a single supplier.
- Faster response time (acceleration & braking) and redundant braking (motor dynamic braking and servo motor brake) with the improved design.
- Improved safety (load dropping if the belt fails) and reduced guarding required (lower cost) due to the elimination of the belt system.

This collaboration exemplifies how innovative engineering can simplify complex systems, reduce costs, and enhance performance. By rethinking the original winch design, the company achieved significant reductions in complexity, weight, and maintenance, while improving reliability and efficiency. This streamlined approach not only met the rigorous demands of a marine environment but also delivered a robust and cost-effective solution that exceeded the customer's expectations.

In the Shipyard

From Design to Delivery

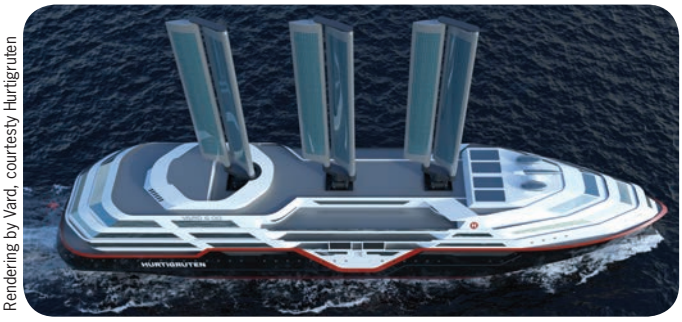
EST Calls for Tender for Battery-Powered Electric Ferry



Last month Estonian State Fleet announced a call for tender for the design and construction of a new, battery-powered electric ferry to serve the main islands in Estonia. The new ferry will primarily be powered by green electricity, sourced from the shore and stored in the ship's onboard batteries. In addition, biodiesel-powered auxiliary generators will be available for use during extreme ice conditions or other special circumstances. According to Sander Sääsk, Director of Development Services at the Estonian State Fleet, "The project's funding criteria require the new ferry to be at least 66% more energy-efficient than the reference vessel." The ferry will accommodate up to 500 passengers and around 130 vehicles. The overall length of the ferry must be between 100 to 114 meters, considering the specific characteristics of the Kuivastu and Virtsu harbors. The ferry must also meet ice class 1B as defined by the Finnish-Swedish ice class regulations.

The new ferry is planned to be the main vessel for the Virtsu-Kuivastu route in Estonia but will also be suitable for the Rohuküla-Heltermaa route if necessary. The deadline for submission of tenders for the construction and design of the vessel is December 10, 2024. The ferry is scheduled for completion by February 2027. For further details regarding the tender, please visit the Estonian Procurement Register at **https://riigihanked.riik.ee/rhr-web/#/procurement/7891704/general-info**

Can a Cruise Vessel Really be Zero Emission? **Hurtigruten says 'Yes'**



Rendering by Vard, courtesty Hurtigruten

Hurtigruten released updated plans for its Sea Zero project, a zero-emission ship scheduled to debut in 2030 which is now in its R&D phase. The ship, as designed today, will lean on large batteries, sails, and other solutions to sail emission-free during normal operation, while energy consumption could be reduced by 40-50%.

Hurtigruten announced its Sea Zero project in October 2022, and unveiled its first set of renderings in summer 2023. A second version of renderings are now released, developed in Ålesund by Vard.

In addition, the company is also going through a 100 million Euro upgrade of its fleet that includes several ships becoming battery-hybrid-powered and inclusion of technology that will significantly reduce both CO2 and Nitrogen oxides (NOx) emissions by 25% and 80%, respectively.

A distinctive feature of the new ship design are the OceanWings sails which can be raised and lowered as needed. Preliminary estimates indicate that the sails could reduce energy consumption by around 10% over time. Additionally, solar panels will contribute another 2-3% in energy savings.

"We still see significant energy savings from having retractable sails with solar panels, but this requires thorough studies, including model tests to be conducted in the coming months. We have also changed the sail type to a more mature design already in use on cargo ships," said Chief Operating Officer Gerry Larsson-Fedde of Hurtigruten.

The ship is planned with contra-rotating propellers as the main propulsion, and the batteries will have a capacity of around 60 MW hours. Two retractable thrusters at the stern will ensure optimal maneuvering during port operations and provide increased safety through redundancy.

Another tech on trial is air lubrication of the hull, where air bubbles are pumped beneath the hull to reduce drag, a system that reportedly can provide energy savings of 5-10%. Combined with modern hull design, advanced anti-fouling coatings, and regular hull cleaning, water resistance can be significantly reduced. Preliminary results also show that better ventilation and insulation systems, as well as advanced energy management, can lead to significant energy savings.

In the Shipyard

From Design to Delivery

Credit Ibaizaba

New LNG Bunker Vessel for TotalEnergies LNG Bunkering Ops

TotalEnergies signed a charter contract with Spanish shipowner Ibaizabal for a new Liquefied Natural Gas (LNG) bunker vessel of 18,600 cu. m. capacity. In particular, this additional vessel might be deployed in Oman, where the Company is developing the Marsa LNG project with the objective to provide LNG to the shipping sector in the Gulf.

The vessel, owned by Ibaizabal, will supply LNG to a wide range of vessels (containerships, tankers, large cruise ships, ferries) at TotalEnergies' LNG bunkering hubs.

This new vessel, currently being constructed by Hudong–Zhonghua Shipbuilding in China, will be delivered by the end of 2026 and will join TotalEnergies' current fleet of three deployed LNG bunker vessels: the Gas Agility, which has been positioned in the port of Rotterdam, the Gas Vitality, operated in the Port of Marseille and the Brassavola located in the Port of Singapore.

© Incat Crowther

Singapore Ferry Operator Takes Two New Vessels

Singapore's Majestic Fast Ferry expands its fleet courtesy the delivery of a pair of new, Incat Crowther-designed 42m ferries. There are additional sister-ships under construction at Indonesia's PT Cahaya Samudra. The 343-passenger ferries operate at a maximum speed of 39 knots and a cruising speed of 36 knots. The main deck has seating for 295, with five bathrooms – including one handicap accessible bathroom and luggage storage space. The vessels' upper deck can accommodate 48 passengers and includes a large bathroom, luggage holds as well as the vessels' elevated wheelhouse.

A new hull form for these second-generation ferries allows for an increased deadweight, while operational sea condition limits and passenger numbers are also enhanced.

"Incat Crowther's deep understanding of our operational requirements has delivered vessels that offer both high performance and long-term value," said Max Tan Managing Director, Majestic Fast Ferry. "We're confident this fleet will support the expansion of our services and provide a reliable choice for passengers, while our first-generation ferries designed by Incat Crowther continue to hold their value on the used vessel market."

In addition to the two new 42-m vessels, several more Incat Crowther 42's are under construction while thirteen second-generation Incat Crowther designed and PT Cahaya Samudra built 39-metre vessels are also either already in service for Majestic Fast Ferry or under construction.

Tech Files

Innovative Products & Systems

LPG 'Pre-fit' Option for WinGD X-DF-A

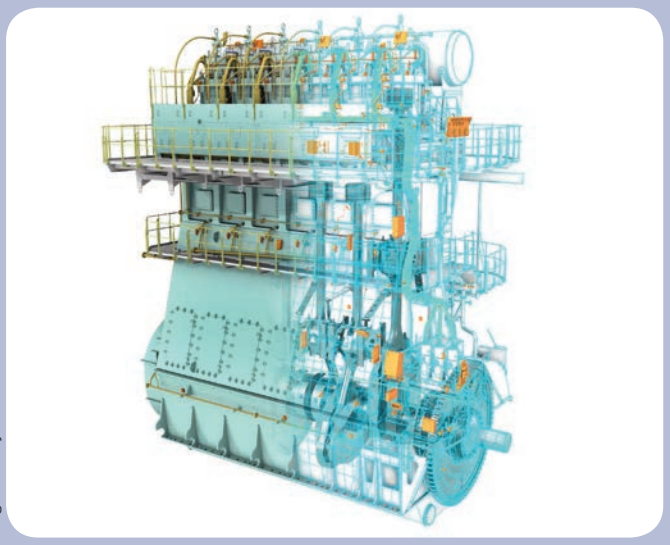


Image courtesy WinGD

WinGD introduced an option for its X-DF-A ammonia-fuelled engines to be delivered capable of running on liquified petroleum gas (LPG), a 'pre-fit' solution that could be of interest to vessels under construction for the anticipated global trade in ammonia, which will also be capable of transporting LPG.

Named X-DF-P for the propane that is LPG's primary component, the solution will be released to enable first engine deliveries in 2027, when operators are likely to be considering in detail their anticipated balance between the LPG and ammonia trades. The engine, designed and optimized for ammonia fuel, will offer reliable and efficient running on LPG, with a minor modification preparing it to run on ammonia at a later date.

Engine sizes under development are those typically used by trade-relevant vessels, including 52- and 62-bore.

Triplex Diaphragm Pump

LEWA presented its triplex diaphragm pumps in a new size at this year's SMM. With an hydraulic power of 10 kW, the LEWA triplex G3E is the smallest of its kind to date and offers a low-pulsation alternative to single-head pumps in the medium power range. As with all models in the LEWA triplex series, the three pistons in this variant are located in a common crankcase. The monoblock design makes the unit more compact than comparable modular solutions and has fewer individual components like seals and couplings, which makes the machine extremely robust. The LEWA triplex G3E has a permissible stroke frequency of up to 350 spm, which is very high for this size range, thus achieving a maximum flow rate of around 20 m3/h at 16 bar.

www.lewa.de

AI-Powered Vessel Tracking & Monitoring

A partnership between Iceland's TM Insurance and Hefring Marine promises to bring the *'big brother is watching'* mantra foward faster in marine operations. Touted as an AI -driven 'digital assistant', the primary target for this offering are the helm stations of fast craft, and according to Hefring Marine, IMAS Helm addresses both accident prevention and fuel efficiency. The Control Unit is the central computing module that collects, stores, and processes data from the Sensor Unit and other onboard systems via NMEA2000. The information is displayed on a display via ethernet connection. Additionally, all data is uploaded to the IMAS Cloud platform via a cellular network or the vessel's modem.

Rim-Drive Thruster Achieves Silent-E Notation

Kongsberg Maritime's rim-drive azimuth thruster has achieved Silent-E notation from DNV, the first of its kind to receive this certification. Installed on the new Commissioning Service Operation Vessel (CSOV) Norwind Hurricane and its sister vessels, the thruster demonstrated exceptional performance in reducing underwater noise pollution during a recent trial.

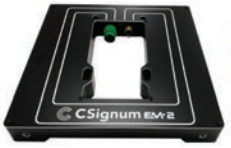
To assess the noise levels of the Norwind Hurricane, an extensive underwater noise study was conducted using hydrophones placed on the seabed. The results unequivocally confirmed the effectiveness of the rim-drive thruster in reducing underwater noise.

Tech Files

Innovative Products & Systems

CSignum Wireless Under-Ship Monitoring

CSignum launched its latest innovation, the EM-2S. This new solution is purpose-designed to be mounted on marine vessels below the waterline providing essential communications for advanced monitoring functions. CSignum's patented electromagnetic field signaling (EMFS) crosses the divide enabling underwater sensor data to be communicated to networks above the surface.



EM-2 - Topside Data Retrieval

EM-2S - Under Ship Data Collection

Book Review

Maritime Firefighting – *Bridging Tradition and Technology to Shipboard Firefighting*

Maritime Firefighting by **Captain Emil Muccin**, USMS (ret.) and **Matthew Bonvento** is a comprehensive and modern guide for maritime professionals. It addresses the unique challenges of shipboard firefighting by integrating traditional methods with the latest advancements in equipment and procedures. This book effectively replaces outdated instruction aids by providing up-to-date, actionable knowledge. Using the IMO Model courses of Basic and Advanced Firefighting as a baseline, the authors take a deep dive into subjects that have not been explained in detail in previous books; topics such as firefighting process hazards, modern case studies, and current medicine at sea.

Unlike older texts and manuals, this book takes a forward-thinking approach, offering detailed information on cutting-edge firefighting equipment and technologies. The authors stress the importance of understanding contemporary fire risks on vessels, which are becoming increasingly complex with advancements in maritime operations. The focus on updated fire suppression techniques, such as modern foam and gaseous agents, illustrates the evolution from more basic, traditional methods.

Each chapter builds on essential firefighting knowledge, starting with the fundamentals of fire behavior in maritime settings and progressing through specific tactics for various vessel types. The sections on firefighting equipment stand out, offering in-depth discussions of modern fire suppression systems and tools, emphasizing their role in improving both efficiency and safety. Chapters dedicated to firefighting in confined spaces and coordination between ship and shore-based firefighting teams bring valuable insights into high-risk, real-world scenarios that reflect today's challenges and real-world incidents.

The writing is clear and accessible, making it suitable for both experienced firefighters and those new to maritime safety. The inclusion of detailed diagrams, procedural checklists, and visual aids enhances the practicality of the content, allowing readers to apply these firefighting strategies directly to their work environments. An important aspect of the textbook is that key terms in bold are defined in a comprehensive Glossary of Terms making it easier for the reader to understand critical concepts. Since this is a technical field, many terms are introduced, and the textbook includes a very thorough Glossary of Abbreviations for easy reference.

One of the book's greatest strengths is its ability to blend traditional knowledge with modern updates, making it highly relevant for today's maritime professionals. The focus on modern firefighting technology, such as advanced fire detection systems and updated fire suppression agents, sets it apart from older firefighting textbooks. Additionally, real-world examples and expert insights provide readers with applicable modern skills and knowledge.

The books is available on both Barnes and Noble and Amazon. The books is also available directly through the publisher, Schiffer publishing.

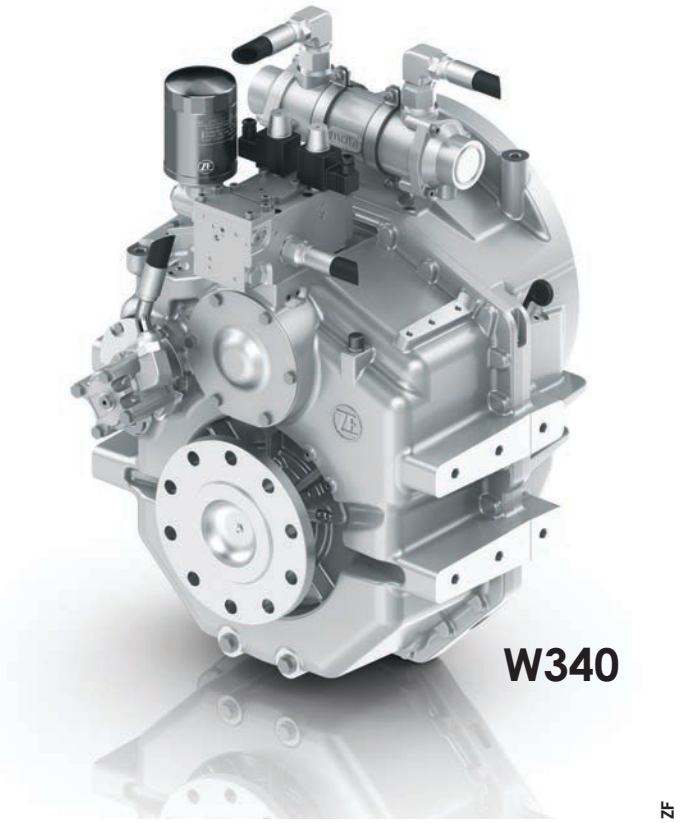
MANUFACTURER IN FOCUS: ZF

Friedrichshafen, Germany
https://www.zf.com/products/en/marine/marine_na/marine_na.html
No. of Employees : 168,000
President/CEO : Holger Klein
Annual Sales: $50.7 Billion (in 2023, company wide)

ZF marine products include transmissions, thrusters, propellers, propulsors, controls, electronics and hybrid technologies to meet the demands of nearly any marine application. Its customer service is available 24/7 through its mobile app and 1-833-ZFWRENCH hotline to assist clients anytime, anywhere – whether they need a part or technical support. ZF's latest products demonstrate technologies that not only advance the industry, but also the experience of being on the water. ZF is a 110+ year-old, trusted global provider of marine propulsion solutions. It specializes in delivering both individual components and complete systems tailored to diverse vessel types. ZF offers a comprehensive range of marine transmissions (reversing, non-reversing and hybrid), propellers, thrusters, steering systems, and electronic control systems. Catering to commercial and fast craft boats, pleasure craft, and yachts, its products span a power range up to 12,000kW.

ZF recently launched its latest product in its azimuth thruster (AT) series, the **ZF AT 90, a new well-mounted, Z-Drive thruster** that is compatible with a wide range of commercial vessels, including commercial fishing vessels, supporting max power of 1,978 kW / 2,651hp, increasing the power and thrust capabilities of the thruster product line. Fully customizable to nearly any hull shape or vessel profile, the ZF AT 90 is designed to be flexible. As is true of all thrusters in the AT series, the ZF AT 90 can be executed as part of a hybrid or fully electric system, requiring reduced engine power during vessel operation, full electric sailing, dynamic positioning and slow cruising while in electric mode, and more. Operators who install the AT series aboard vessels are one step closer to earning a CLEANSHIP class notation.

ZF's latest transmission for commercial vessel operations geared toward commercial fishing vessels and small workboats, the **W340's cast iron construction** backs powerful features to ensure vessels perform. It has a medium duty rating of 602 hp at 2,300 rpm for most gear ratios. For most ratios, the continuous duty rating is 508 hp at 2,100 rpm. It also comes standard with Supershift2 technology, ZF's unique mechanical/hydraulic clutch control system which delivers quick, smooth shift engagement and precise control of transmission output. It is compatible with all types of engines and propulsion systems, including waterjets and surface-piercing propellers. It has a compact, space-saving design and an emergency 'get home' capability. Introducing ZF NRD Series Transmissions The ZF NRD Series Transmissions are designed for waterjet applications, offering a diagonal offset for increased flexibility in multiple waterjet installations and tight spaces. These transmissions feature waterjet-specific ratios, ensuring optimal performance and efficiency for this propulsion type.



ZF

Other Transmissions Set to Debut Soon: ENC transmissions are in development and are expected to be available for delivery in 2025. They are based on the current series of transmissions and are optimized for direct mounting to electric motors of any size. The 3200 A/V Hybrid Transmission will debut at the end of 2024. This new transmission will be available in both down-angle and V Drive configurations, providing flexibility in various marine applications. Designed with ratios commonly found in fast craft A/V transmissions, the 3200 A/V will support a range of power ratings (P-L-M-C), with specific values to be announced closer to launch.

GAO: USCG ARCTIC PLANNING, OPS CHALLENGES PERSIST

By Heather MacLeod, Director, GAO's Homeland Security and Justice team

The effects of climate change, technological advancements, and economic opportunities have created competition between the United States and its strategic adversaries in the Arctic region. Both Russia and China have developed Arctic strategies with geopolitical goals contrary to U.S. interests, including the control of resources and sea routes. In recent months, the U.S. Navy and U.S. Coast Guard have encountered Russian and Chinese naval vessels near Alaska.

The U.S. Government Accountability Office (GAO) has recently published several reports assessing the federal government's management of Arctic efforts. These reports found that the Coast Guard has taken steps to protect U.S. interests in the region, including developing strategies and coordinating across agencies. However, Coast Guard operational challenges remain, such as a lack of assets in the region and incomplete information to measure the effectiveness of federal efforts.

Planning efforts. The Coast Guard and the federal government have taken steps to plan and coordinate for a changing Arctic region. Further, the federal government published its most recent Arctic strategy in October 2022 and an implementation plan in October 2023. Together, these serve as a framework for guiding its approach to addressing emerging challenges and opportunities in the Arctic.

GAO reported in August 2024 that the Coast Guard has also made progress to identify and assess risks—such as those resulting from climate change and increased maritime activity—that affect its ability to carry out its missions in the Arctic region. This information in included in the Coast Guard's strategy and implementation plan, however this plan lacks key components that are essential to promote its effectiveness, such as performance measures, targets, and time frames for the action items it identifies. These elements could help the Coast Guard more effectively plan for its near- and longer-term priorities and would help ensure that its strategic objectives remain aligned with the national Arctic efforts.

Coordination efforts. The federal government has initiated multiple efforts to coordinate on Arctic issues. For example, GAO reported in September 2023 that Arctic stakeholders—including federal agencies and foreign governments—identified White House-led coordination groups as useful tools to support information sharing and Arctic strategy efforts. However, some stakeholders said that the federal government faces various challenges related to interagency coordination that hinder implementation of U.S. Arctic priorities outlined in the 2022 strategy. All seven experts GAO spoke with said the United States lacks an effective interagency coordination mechanism for its Arctic efforts.

Federal agencies also coordinate directly with each other. In August 2024, GAO reported that Coast Guard and Department of Defense (DOD) collaborated in the Arctic to assess and manage risks in several ways, including sharing relevant information and expertise and providing operational assistance. For example, both agencies collaborated on the development of their Arctic strategies to improve domain awareness. The Coast Guard also provides standby search and rescue support for DOD joint exercises with the Canadian Armed Forces and participates in the Alaska National Guard's recurring exercise to train for homeland security and emergency response missions. Moreover, the Coast Guard's Defense Readiness mission requires it to maintain the training and capability needed to integrate with DOD forces and coordinate as needed with U.S. Northern Command, which has responsibility for homeland defense efforts in the Arctic region.

Coast Guard Operations. The Coast Guard has established strategic commitments for maintaining an operational presence in the Arctic by deploying personnel, ships, and aircraft to help mitigate risks in the region. To help meet these commitments and better manage its operations, the Coast Guard forward deploys assets to key locations in the U.S. Arctic region from other locations—such as California, Hawaii, Washington, and elsewhere in Alaska. This forward deployment reduces transit times for carrying out its missions in the summer and fall when maritime activity peaks in the region.

However, in recent years the Coast Guard has been unable to meet all its strategic commitments for the Arctic region. This has primarily been due to ship availability challenges resulting from, for example, competing demands for the Coast Guard to be present in the Indo-Pacific region and fires on the polar icebreaker Healy in 2020 and 2024, which shortened its planned deployment days.

GAO's August 2024 report found that the Coast Guard hasn't fully tracked the time spent on its Arctic activities when resources were deployed. Collecting and reporting complete information would better position it to make more informed operational planning decisions for the region, better allo-

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Kathleen Hickey — 9/18/2024

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cate its constrained resources, and assess its progress toward achieving its Arctic strategic goals.

To address operational challenges in the Arctic and other regions, the Coast Guard plans to acquire 28 new cutters, including at least three new icebreakers. But in the interim, it has projected an operational gap through 2039. Until these new ships enter service, cutter and icebreaker shortages may continue to challenge the Coast Guard's ability to meet its Arctic commitments. Further, acquisition of these three icebreakers is years behind schedule and up to $2 billion over the initial cost estimate, as reported by GAO in June 2024. Meanwhile, Russia has more than 40 icebreakers, and China—which is not an Arctic nation—has three.

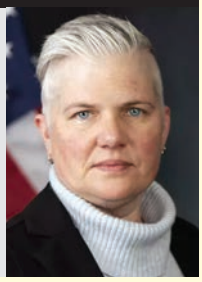
Coast Guard operational challenges in the U.S. Arctic region are amplified by limited infrastructure and logistics capabilities in Alaska. For example, the Coast Guard operates its forward deployed helicopters from a leased Alaska National Guard aircraft hangar in Kotzebue, Alaska because the service lacks its own infrastructure. The infrastructure that the Coast Guard does have is aging and sometimes in a state of disrepair. In February 2019, GAO found that the Coast Guard faced a costly backlog of shore infrastructure projects related to docks, air stations, and other infrastructure from which missions such as ice breaking and defense readiness begin and end. This backlog totaled at least $2.6 billion at that time.

The Coast Guard has a key role within the federal government in Arctic policy implementation and enforcement. It is facing growing responsibilities to assess and manage risks to maritime safety and security and national security as regional conditions continue to change. However, there are several concerns with the service's Arctic planning and operations. GAO has made a number of recommendations in its reports, including improving its planning, acquisition, and data collection efforts. Implementing these recommendations is critical to protecting U.S. interests in the Arctic.

The Author

MacLeod

Heather MacLeod is a Director in GAO's Homeland Security and Justice team. She oversees Coast Guard and maritime security issues, including Coast Guard workforce and strategic planning efforts, and maritime port and supply chain/cargo security.



BUYER'S DIRECTORY

This directory section is an editorial feature published in every issue for the convenience of the readers of MARITIME REPORTER. A quick-reference readers' guide, it includes the names and addresses of the world's leading manufacturers and suppliers of all types of marine machinery, equipment, supplies and services. A listing is provided, at no cost for one year in all issues, only to companies with continuing advertising programs in this publication, whether an advertisement appears in every issue or not. Because it is an editorial service, unpaid and not part of the advertisers contract, MR assumes no responsibility for errors. If you are interested in having your company listed in this Buyer's Directory Section, contact Mark O'Malley at momalley@marinelink.com

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Anchor Marine & Supply, INC., 6545 Lindbergh Houston, Texas 77087 , tel:(713) 644-1183, fax:(713) 644-1185, david@anchormarinehouston.com

ENGINE ORDER TELEGRAPH

Prime Mover Controls, 3600 Gilmore Way Burnaby B.C. V5G 4R8 Canada , tel:604 433-4644, fax:604 433-5570, Michael.Combs@pmc-controls.com

INERTIAL SENSING SYSTEMS

Silicon Sensing Systems Ltd, Clittaford Road Southway, Plymouth, Devon PL6 6DE United Kingdom , UK , tel:+44 (0) 1752 723330, sales@siliconsensing.com

INTERCOM SYSTEMS

David Clark Headset Communication Systems, 360 Franklin Street, Worcester, MA 01615, USA , tel:+1 (508) 751-5800, sales@DavidClark.com contact: Sales Department, www.DavidClark.com

MARINE SENSORS

Falmouth Scientific, Inc., PO Box 326, Pocasset, MA , USA , tel:(508) 564-7640, fhegg@falmouth.com contact: Fred Hegg, Falmouth.com

MEMS MOTION SENSING

Silicon Sensing Systems Ltd, Clittaford Road Southway, Plymouth, Devon PL6 6DE United Kingdom , UK , tel:+44 (0) 1752 723330, sales@siliconsensing.com

METEOROLOGICAL INSTRUMENTS

R.M. Young Company, 2801 Aero Park Dr., Traverse City, MI , USA , tel:231-946-3980, fax:231-946-4772, vsherman@youngusa.com

MILITARY SONAR SYSTEMS

Massa Products Corporation, 280 Lincoln Street, Hingham, MA 02043-1796 , tel:(781) 749-4800, nel@massa.com

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Prime Mover Controls, 3600 Gilmore Way Burnaby B.C. V5G 4R8 Canada , tel:604 433-4644, fax:604 433-5570, Michael.Combs@pmc-controls.com

OCEANIC TRANSDUCERS

Massa Products Corporation, 280 Lincoln Street, Hingham, MA 02043-1796 , tel:(781) 749-4800, nel@massa.com contact: Nick Landis

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Massa Products Corporation, 280 Lincoln Street, Hingham, MA 02043-1796 , tel:(781) 749-4800, nel@massa.com

UNDERWATER SONAR SENSORS

Massa Products Corporation, 280 Lincoln Street, Hingham, MA 02043-1796 , tel:(781) 749-4800, nel@massa.com

VESSEL BUILDING: RESEARCH, PASSENGER, CATAMARAN, PATROL AND SURVEY

All American Marine, 1010 Hilton Ave., Bellingham, WA , USA , tel:(360) 647-7602, Sales@AllAmericanMarine.com contact: Daniel Zech, AllAmericanMarine.com

Employment

www.MaritimeJobs.com

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www.MaritimeProfessional.com

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Vessels, Barges & Real Estate for Sale/Rent

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23	Advanced Mechanical Enterprises	www.AMEsolutions.com	(954) 764-2678
67	Anchor Maine & Supply, Inc.	www.anchormarinehouston.com	(800) 233-8014
53	Appleton Marine, Inc	www.appletonmarine.com	(920) 738-5432
31	Autoship Systems Corp.	www.autoship.com	(604) 254-4171
15	Bayonne Drydock	www.bayonnedrydock.com	(201) 823-9295
37	Blount Boats	www.blountboats.com	(401) 245-8300
31	Carver Pump	www.carverpump.com	(563) 263-3410
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19	Cimolai Technology S.P.A.	www.cimolaitechnology.com	011 39 049 0404 539
65	Creative Systems, Inc.	www.ghsport.com	(360) 385-6212
C3	David Clark Company	www.DavidClark.com	(508) 751-5800
47	Detyens Shipyards, Inc.	www.detyens.com	(843) 308-8000
18	Ebac Systems	www.ebacusa.com	(757) 873-6800
39	Fairbanks Morse Defense	www.fairbanksmorsedefense.com	(608) 364-8358
51	Floating Wind Solutions	www.FloatingWindSolutions.com	Please visit us online
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3	KVH Industries, Inc	www.kvh.com	(401) 847-3327
63	Markey Machinery	www.markeymachine.com	(425) 245-3500
9	Military Sealift Command	www.sealiftcommand.com	Please visit us online
75	NOAA/Eastern Region Acquisition Division	http://marinerhiring.noaa.gov	Please visit us online
29	Omnithruster	www.omnithruster.com	(330) 963-6310
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C4	R.W. Fernstrum & Company	www.fernstrum.com	(906) 863-5555
19	Resolve Marine Group	www.resolvemarine.com/careers	(954) 764-8700
13	RIX Industries	www.rixindustries.com	Please visit us online
39	RTF Manufacturing	www.rtfmanufacturing.com	(518) 828-2180
1	United Safety / Fireboy Xintex	www.usscgroup.com	(610) 265-3610
11	Wabtec Corporation	www.wabteccorp.com/marine-solutions	Please visit us online
17	Walz & Krenzer Inc.	www.wkdoors.com	(203) 267-5712

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