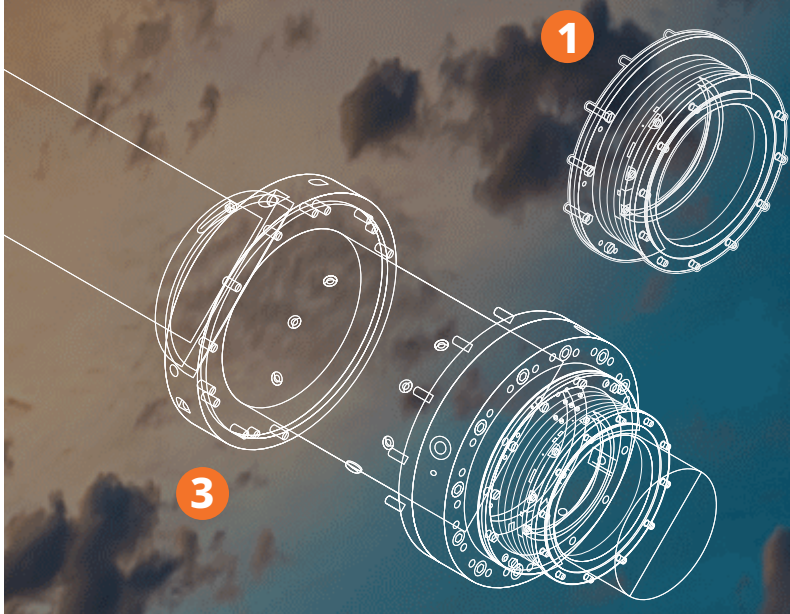
DRYDOCK MAGAZINE SEPTEMBER 2024

FACE THE FACTS: Comprehensive systems service is critical, MacGregor stresses

SPOTLIGHT: Cruise & ferry efficiency upgrades and sustainability at SMM

AREA REVIEW: Innovation at SMM and retrofits and repairs in Northern Europe

WÄRTSILÄ



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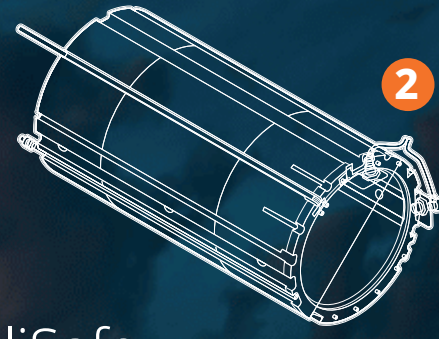

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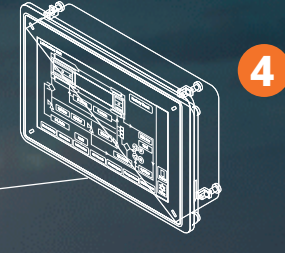

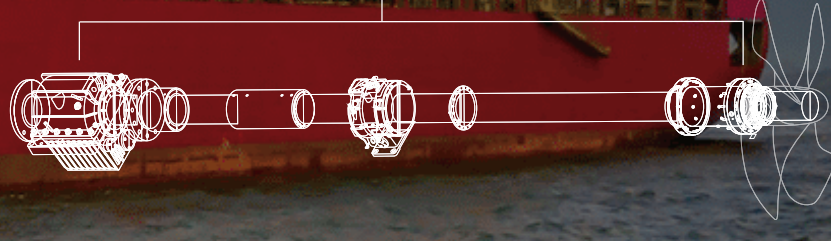

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Production Manager: **Tatum Le Patourel**
Design: **Fiona Andreanelli**
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Subscriptions: **Emma Hardy**
Publisher: **Andrew Deere**
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THE MPI GROUP

MPI Group
Peel House, Upper South View
Farnham, Surrey GU9 7JN, UK
Tel: +44 (0)1252 732220
info@mpigroup.co.uk
www.mpigroup.co.uk

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MacGregor maintenance services go the extra mile

While safety and efficiency are designed into its load-handling equipment, MacGregor stresses that comprehensive systems service is critical to protecting vessel crew, the environment, and the customer's bottom line. As a worldwide supplier of cargo- and load-handling solutions, MacGregor understandably counts safety as a core value for the design, development, and operation of every system it offers. Across a range of equipment designed to maximise efficiency and minimise operational risk, certain systems, such as hatchcovers, play a direct role in ensuring a ship's seaworthiness. Others – davits, for example – are used to support life-saving operations, explains *Göran Johansson, MacGregor's Regional Account Manager for the North Sea area.*

Göran Johansson has been with MacGregor for just over 17 years. From January 2019 to the present day he has been Regional Account Manager, North Sea and has also been Branch Manager, Norway, Global Life Support since January 2016. He was previously Business Manager for Norway from January 2012.

Before that he worked for Odfjell, where he was Purchaser for nearly two and a half years. He also worked as a Purchaser for Jo Tankers for eight years and nine months starting in May 1996, and before that at MacGregor Hägglunds for four years as a Spare Part Sales Engineer.

He studied at Mid Sweden University in 1993 and before that at Parkskolan, Örnskøldsvik between 1986 and 1989, where he studied mechanical engineering.


MACGREGOR

MacGregor customers can opt to upgrade equipment halfway through its service life

Q. How do you rate maintenance in terms of safety?

A. Upholding safety standards is by no means simply a matter for system design and delivery. The company's maintenance services are critical to ensuring its solutions continue to operate safely, efficiently, and in accordance with regulations for the duration of the vessel's lifecycle.

Most of our products involve heavy lifting, high pressures, and heavy-duty components, while some, like davits, are directly related to safety. So while all our systems comply with the highest safety standards, we are acutely aware that improper maintenance puts the ship, its crew, and the environment at risk. Keeping equipment in good working order is of paramount importance.

Q. What makes MacGregor stand out from its competitors?

A. MacGregor service engineers have unrivalled knowledge of the company's products and are trained in line with latest regulations and class requirements. Moreover, in some cases, the safety performance of MacGregor

systems, including the watertightness of its hatchcovers and ro-ro ramps, has set the benchmark for class standards on testing and safe operation at sea.

MacGregor service agreements offer the best way to keep systems functioning optimally. By carrying out inspections and maintenance at regular intervals as laid out in a service agreement, MacGregor cuts unplanned downtime and reduces the risk of serious incidents. The company's service agreements can include the scheduled delivery of spare parts, meaning that if a component fails mid-voyage, it can be replaced quickly and cost effectively.

By anticipating faults and proactively addressing them, we minimise the risk of incidents such as injuries to crew or oil spills from faulty hydraulic equipment. Service agreements are about giving customers peace of mind. Our customers also benefit financially through reduced repair costs and maximised vessel uptime.

Q. Can you provide examples of customers who have benefitted financially?

A. A shipowner whose vessels had experienced frequent off-hire periods of several hours at a time due to persistent faults with their cranes and ramps. After signing a MacGregor service agreement, the customer was able to cut its off-hire hours to zero over an entire year, improving its reputation among charterers as a result.

Another shipowner was able to dramatically reduce cargo damage with a MacGregor service agreement applying to hatchcovers. This not only enhanced the company's reputation but also ensured the quality of hatchcovers was consistent across its fleet. Now, when fulfilling an order, the owner can deploy whichever vessel is closest to the loading port rather than sending a specific ship regardless of its position. This has had a hugely positive impact on the customer's fleetwide operational efficiency.

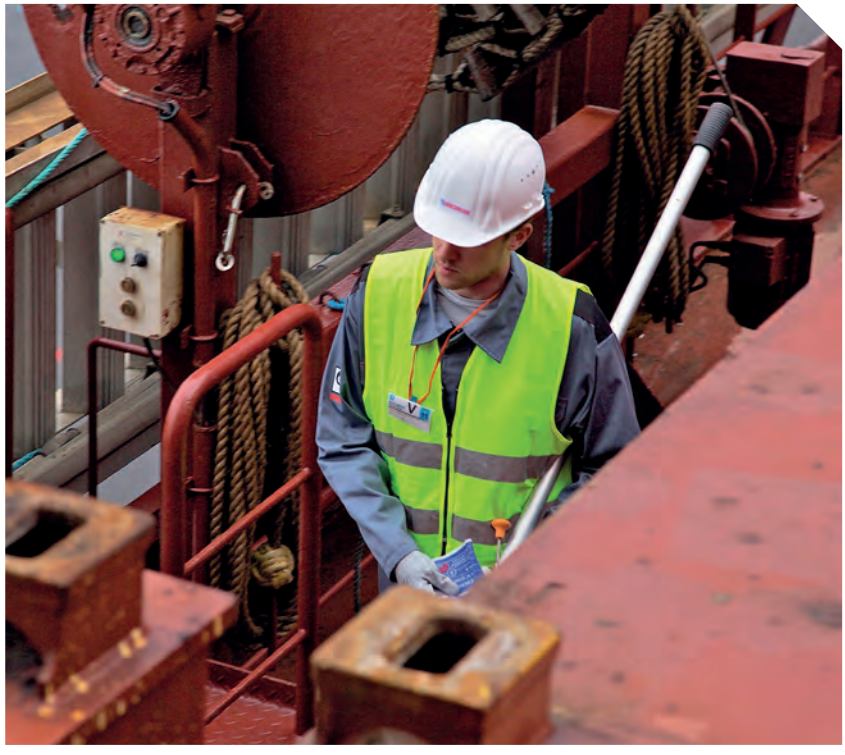
Q. Can equipment be upgraded?

A. To maximise the value of their investment, MacGregor customers can opt to upgrade equipment halfway through its service life. Our equipment is built to last for the full vessel lifecycle, and in that time, a lot can change in terms of technology and regulations. We therefore offer upgrades in which we apply, for example, new, energy-efficient technology to an existing system to help the customer reduce operating expenditure and maintain regulatory compliance.

Q. Is support available worldwide?

A. MacGregor customers can benefit from the company's global service

> "KEEPING EQUIPMENT IN GOOD WORKING ORDER IS OF PARAMOUNT IMPORTANCE."



A service man carrying out an inspection in the port of Bremerhaven

network, which minimises delay and cost when a technician is required to travel to a customer's ship.

The value of having a local presence in major ports worldwide was emphasised during the Covid-19 pandemic. With global trade continuing to rely on shipping during the pandemic, shipowners continued to rely on our services to keep their vessels up and running. Our extensive service network allowed our engineers to reach customers despite the complicated travel restrictions. It is reassuring for us and our customers to know that any similar situations in the future will not prevent us from providing our services.

Q. What about remote support?

A. MacGregor can provide remote support for less complex procedures by connecting to faulty equipment on board a customer's vessel via satellite link. In this way, technicians in a shore-based office can identify the issue and help the crew to resolve it, eliminating the need for the ship to deviate from its planned route for repairs and saving the operator time and money.

Q. What else is there on offer?

A. Alongside remote troubleshooting, MacGregor offers condition-based maintenance through OnWatch Scout. Connecting onboard equipment to advanced monitoring systems, OnWatch Scout continuously analyses component condition. This enables users to plan maintenance activities more effectively, thereby maximising equipment availability and minimising unplanned vessel downtime.

As a standalone product, OnWatch Scout includes pre-installed maintenance manuals and system drawings, while all alarms include troubleshooting guidelines complete with illustrations and a list of required spare parts, helping crew to carry out basic procedures independently.

Q. How important is training to you?

A. Empowering customers to perform their own routine maintenance and minor repairs reflects a service approach that extends to crew training. For an increasing number of products, MacGregor offers virtual training simulators that allow crew to practise operating equipment in a safe and controlled environment, with a high degree of realism.

Having people on board the ship who are well trained in the operation of its systems is essential. I would say that as many as eight out of 10 incidents on board are due to the misuse of equipment, which can be prevented with proper training. This is why we invest heavily in virtual training simulators as part of our wider service offering.

Q. Is there anything you would like to add?

A. Ultimately, well planned and executed maintenance is critical to the safe and efficient operation of cargo-handling and life-saving systems. We believe that every single component of our equipment plays a part in vessel safety, with even the smallest loose screw in a ramp potentially compromising watertightness and preventing a ship from sailing. Our service offering goes the extra mile to ensure our systems function optimally at all times, for the vessel's full lifespan, to help protect crew, the environment, and the customer's bottom line.

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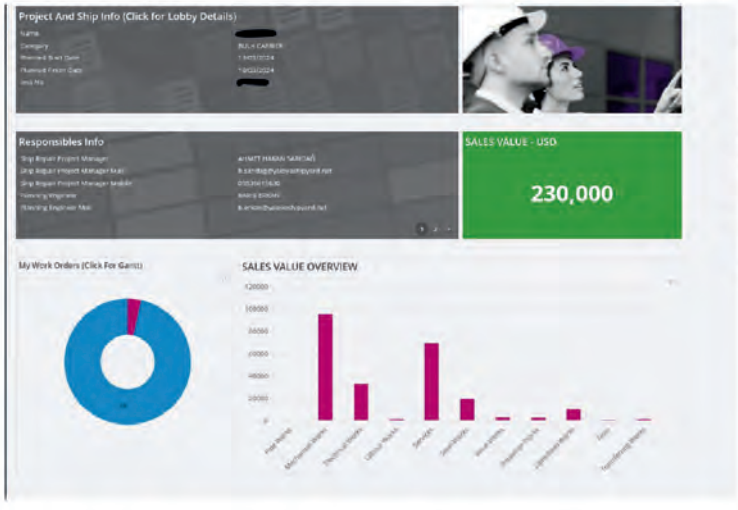

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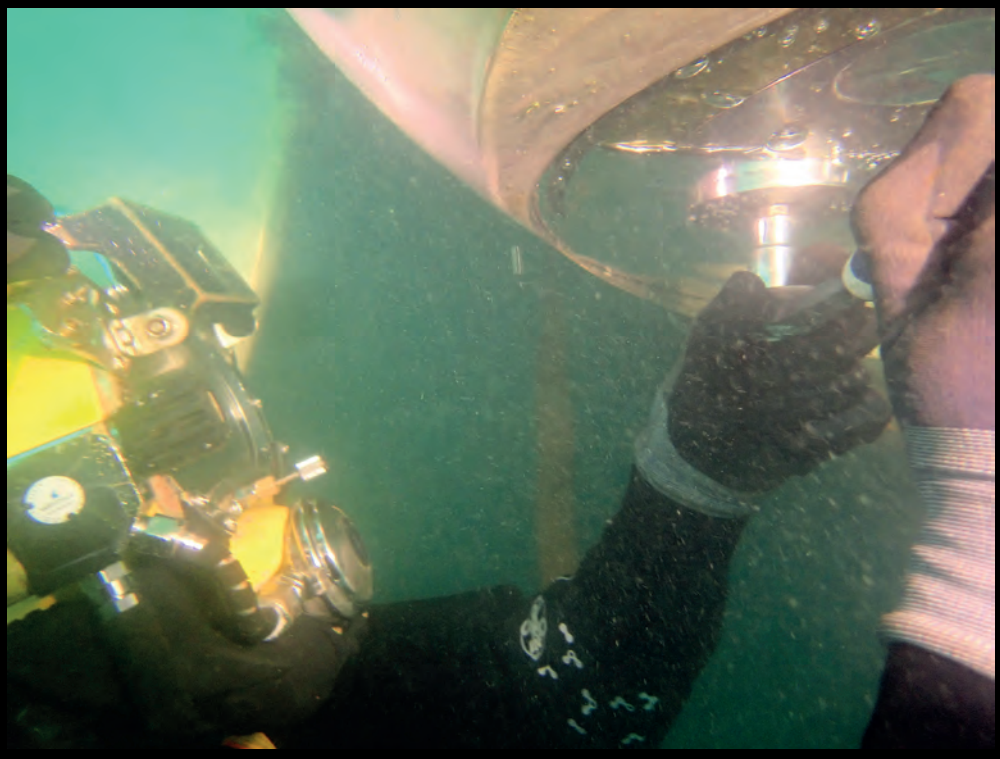
WÄRTSILÄ

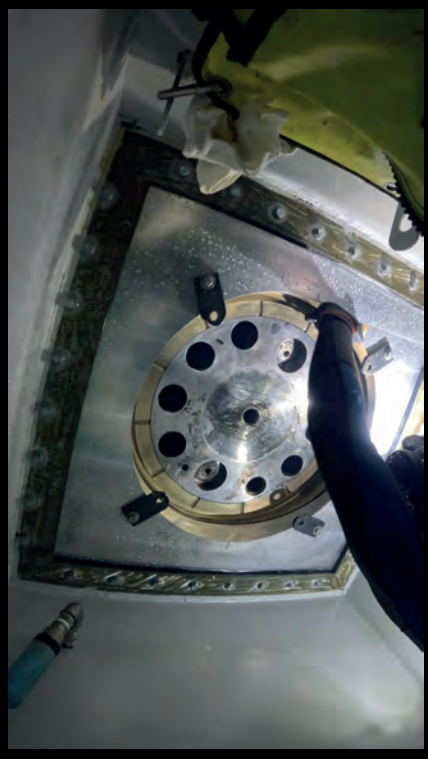
Wärtsilä Underwater Services:

Pioneering Maritime Maintenance with Revolutionary CPP Cofferdam Technology

Wärtsilä Underwater Services has recently showcased its cutting-edge capabilities through a groundbreaking project that underscores its commitment to innovative and efficient maritime solutions. This endeavor involved a specialized vessel where Wärtsilä employed their state-of-the-art CPP cofferdam technology to perform critical maintenance while the vessel remained afloat. Developed two years ago, this technique has revolutionized propeller blade replacement, dramatically cutting down both operational downtime and associated costs.

The Controllable Pitch Propeller (CPP) system is vital for optimizing the performance and fuel efficiency of many vessels by adjusting the propeller blade angle. Traditionally, replacing CPP blades necessitated dry docking—a procedure that is both time-intensive and expensive. Identifying a need for a more efficient method, Wärtsilä Underwater Services introduced the CPP cofferdam technique, enabling blade replacement in a dry hyperbaric condition without docking the vessel.





This innovative CPP cofferdam forms a dry environment specifically around the blade palm, allowing Wärtsilä's team to execute maintenance tasks efficiently. By securing the cofferdam around the propeller hub and evacuating the water, a dry workspace is created. This enables skilled divers and engineers to safely replace the CPP blades, minimizing disruption to the vessel's operations.

During the recent project, this advanced method was rigorously tested. The task involved replacing several CPP blades that had reached the end of their service life. With the CPP cofferdam, Wärtsilä's team created a dry environment around the blade palm, ensuring safe and effective blade replacement. This approach not only maintained the vessel's operational efficiency but also highlighted the practical benefits of this innovative solution, all while striving to minimize environmental impact.

A primary advantage of the CPP cofferdam technique is its significant cost savings. Traditional dry docking procedures incur high costs due to direct expenses and potential revenue loss from extended downtime. The in-water blade replacement facilitated by the CPP cofferdam eliminates the need for dry docking, resulting in substantial financial savings for vessel operators.

Additionally, the CPP cofferdam method reduces the environmental impact typically associated with dry docking. By avoiding the need to relocate the vessel to a dry dock facility, along with its logistical challenges, the carbon footprint of maintenance operations is minimized. This aligns with Wärtsilä's broader commitment to sustainability and environmental stewardship within the maritime industry.

The successful execution of this project highlights the effectiveness and reliability of the CPP cofferdam technique. It signifies a major advancement in underwater maintenance technology, offering a practical and cost-effective solution for CPP blade replacement. Wärtsilä Underwater Services continues to push the boundaries of innovation, delivering solutions that enhance operational efficiency, reduce costs, and promote sustainability.

Looking forward, Wärtsilä Underwater Services remains committed to developing and implementing cutting-edge technologies that address the evolving needs of the maritime industry. The CPP cofferdam is a testament to their dedication to providing innovative solutions that deliver tangible value to clients. Through continuous innovation and a relentless focus on excellence, Wärtsilä Under Water Services is setting new standards in underwater maintenance and repair.

ADAPT & EVOLVE

Portugal's Navalrocha Shipyard has reported significant growth in key target markets including LPG and product carriers after recording one of its strongest ever half-year performances.

Navalrocha Commercial Director Sergio Rodrigues

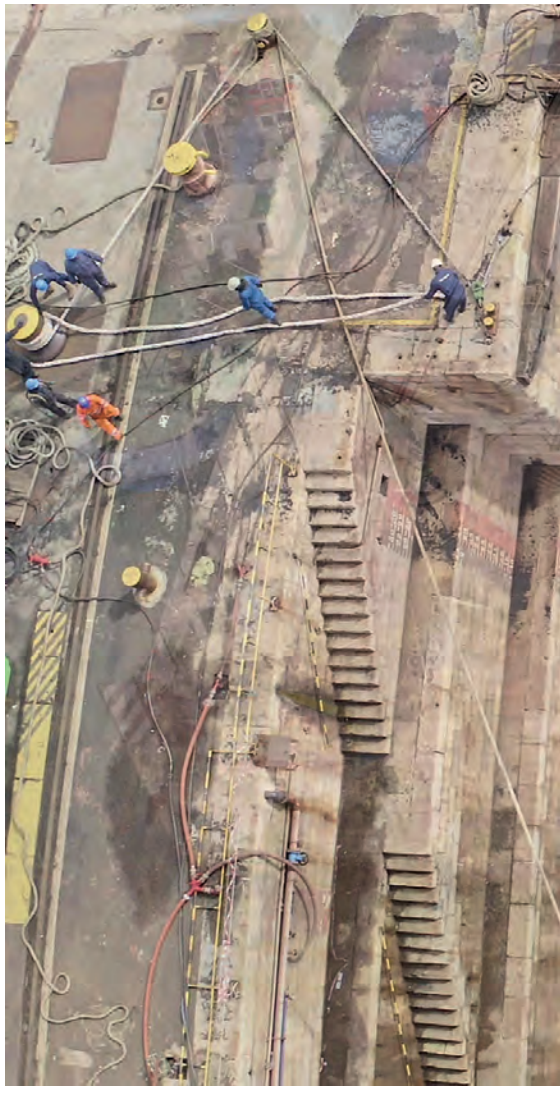
With more than 30 projects delivered to date, Navalrocha is on course for another record-breaking year, having completed further high-profile projects on naval and containerships in addition to cruise, passenger ships and pleasure boats.

Meanwhile, the Lisbon yard is also ramping up to support Iberia's burgeoning offshore renewables sector, having serviced a range of offshore support vessels for market leaders including Fugro and Boskalis.

Supported by a dedicated supply chain, Navalrocha continues to adapt and evolve. Due to high levels of demand, it has accommodated pierside repair projects, adjacent to its drydocks, to manage periods of peak capacity, while despatching specialist engineering teams to support neighbouring shipyards, further increasing work volumes.

Future plans could also involve a pier expansion increasing the range of its current berth to 190m, accommodating vessels up to 140m.

It comes as Navalrocha continues to position itself as an LPG repair hub supporting the North Atlantic and Mediterranean shipping routes. Steady progress in 2024 has seen five LPG



repair contracts, in addition to several bunker tanker and chemical carrier projects.

"We have witnessed tremendous progress in growth markets such as LPG and product carriers in 2024," says Navalrocha Commercial Director Sergio Rodrigues. "This has been matched by similar success in our core sectors, resulting in one of our strongest ever half-year performances."

Long-standing clients

Earlier this year, the yard welcomed long-standing Greek client MM Marine back to the yard to deliver repair packages for bunker tankers *Naxos II* and *Kerkyra*, as part of a strong relationship with agent Resolute Maritime Services. This was followed by a series of projects with continuing Singapore client BW Epic Kosan to deliver repairs to three LPG tankers – *Epic St. Thomas, Epic St. Croix* and *Epic Curacao*. Further progress in the LPG market involved repairs to LPG tanker *Cgas Jupiter,* owned by Christiania Holding A/S. Navalrocha's ever-increasing reputation in the product carrier market further benefitted from a project to support Maltese-flagged oil/chemical tanker *Bomar Ceres*, owned by Borealis Denizcilik, following a deal with agent OKT Shipping.

Expansion in the LPG and product carrier market has been mirrored by activity in the military sector, with Navalrocha now servicing around 10% of the Portuguese naval fleet.

"Navalrocha is in pole position to serve the LPG and product carrier market due to our strategic location, close to

The LPG tanker *Epic St. Thomas* being refloated

The three-masted barque *NRP Sagres* in drydock at Navalrocha

the industrial port hub of Sines and the gateway to Europe," explains Rodrigues. "We are also well positioned for vessels travelling to ports further north along the Portuguese Atlantic coast including Aveiro, Viana do Castelo and beyond. More broadly, we offer a set of distinct benefits to our clients, including a sheltered location with ideal ship repair conditions, with more than 300 days of sunshine per year."

Notable projects

In 2024, a notable project involved repair work to the distinctive steel-built three-masted barque *NRP Sagres* – which serves as a training ship for naval cadets. Navalrocha has also enjoyed growth in the general cargo market, supporting a range of European clients. This includes work to Azorean vessel *Furnas* owned by Mutulista Açoreana, the Barbados-flagged *Wilson Clyde* owned by Wilson Ship Management AS, the *Celtic Explorer* owned by Charles M Willie & Co Shipping in the UK, and the *Atlantic Express* owned by Rohden Bereederung from Germany. It also supported the *Jaime S* (ex-*Orion*) containership owned by Steer Mar Shipmanagement, in addition to Rhode Nielsen's hopper dredger *Viking*.

Passenger ship expansion

Meanwhile, the yard continues to drive expansion in the passenger, cruise and pleasure boat market with a number of standout projects in recent months. These included the *Hanseblick* inland passenger ship, the *Sao Jorge* passenger ferry as well as Grand Circle's cruiseship *Clio*. Navalrocha also saw a return of the cruiseship *Seadream I* operated by SeaDream Yacht Club, along with Explorers-class cruiseship *Le Champlain* operated by Ponant.

Other notable projects in 2024 have involved tugs *Castelo de Sines*, operated by Reboport, and the *Montalvo* and *Montinho* operated by Rebonave.

"The scale of our operation provides a competitive edge with four easy-to-manage drydocks," explains Navalrocha's Commercial Director. "Every project receives 'priority treatment' from our 70-strong workforce and world-class supply chain located onsite. This enables us to deliver fast, efficient and cost-effective solutions." ■

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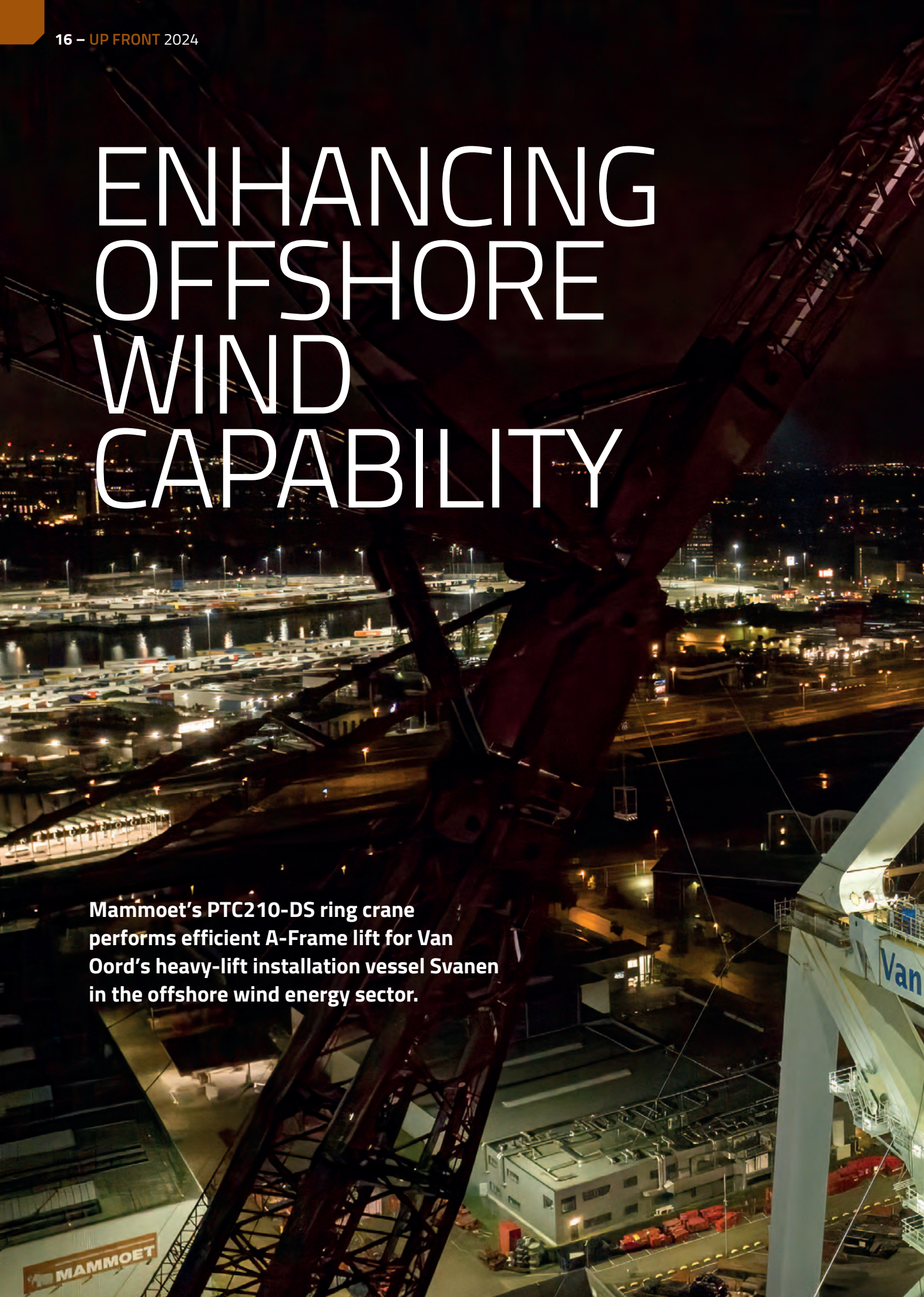

Mammoet's PTC210-DS ring crane performs efficient A-Frame lift for Van Oord's heavy-lift installation vessel Svanen in the offshore wind energy sector.


Oord

As offshore wind turbines continue to grow to achieve greater efficiency, so too do their components. This means that the vessels used for their installation and maintenance must undergo upgrades to handle these larger components.

When the Van Oord-owned vessel *Svanen* received a major upgrade, a key element was the fitting of a bigger A-Frame. This would enable it to install larger, next generation monopile foundations for offshore wind turbines at sea.

Weighing 960 tonnes and measuring 26m wide and 30m high, the new A-Frame would increase the total height of the *Svanen* to an impressive 125m.

With few cranes in the world capable of the lifting to 65m to clear the vessel's deck, the PTC ring crane was perfect for the job as it allowed the frame to be prefabricated and lifted as a complete unit.

This not only allowed for safer assembly of the A-Frame, but dramatically reduced the downtime of the offshore wind vessel. A project that could take a year was completed in a few months and the heavy lift was executed in just one week, thanks to close collaboration between Mammoet and Van Oord.

Heavy lifting and site transport

Mammoet was approached for support with two elements of the project. The first was the transportation and lifting of the three key components that made up the A-Frame.

These were fabricated by Holland Shipyards at two separate warehouses near Rotterdam, before being shipped by inland vessels to Mammoet's quayside headquarters in Schiedam.

Once in Schiedam, the A-Frame was offloaded onto Mammoet Self-Propelled Modular Transporters (SPMTs) and moved to a laydown area.

For this whole phase, a combination of gantry masts, crawler cranes, a 250-tonne harbour crane and floating sheerlegs were utilised.

The second stage was the main PTC hoist. This saw the assembled A-Frame driven 66m using 64 axle lines of SPMT trailer and parked on a temporary support, ready for the PTC to perform the hoist.

The configuration of the PTC ring crane to perform the lift was 107m of main boom, 67m of luffing jib and more than 4,000 tonnes of counterweight.

Weighing up the challenge

The biggest challenge for the engineering team was establishing how different parts fabricated at two separate locations would behave as an integrated component.

It wasn't possible to precisely know its final weight, nor its exact centre of gravity. As Julian Alkemade, Project Manager at Mammoet, explains: "We were able to estimate a certain weight before putting it on a vessel and shipping it to Schiedam for final assembly, but you always have the issue that if you combine those parts together, weld them together, bolt them together, you are unsure of what the exact weight will be. There is always deviation within a certain percentage."

Because of this, the team performed a weighing operation on the A-Frame once it was assembled. They also planned two separate rigging configurations, with the direction to be taken resting on the results of the weighing.

"Between the hook of the crane and the A-Frame itself there is a lot of steel, shackles and grommets, so we had two plans," adds Alkemade. "The weighing campaign was a very important, and integral, part of the process. It determined whether we used longer/shorter grommets, larger/smaller shackles, or changed the lifting eyes."

Right ring crane, right place

Installation of the A-Frame took just one week. The efficiency of this offshore wind energy project was due to Mammoet's close relationship with the customer facilitating easy access to the crane, and the fact that the PTC ring crane made it possible for the frame to be installed in a single heavy lift. It enabled a safer and more efficient plug-and-play solution.

"We are currently supporting Van Oord with a number of developments in the offshore wind power sector to support the efficient handling of monopiles," says Remco Zandstra, Commercial Manager at Mammoet.

"By engaging early during the project, we were able to ensure the right equipment was reserved for this unique project. We are proud to support Van Oord's impressive ambitions within the wider energy transition."


MAMMOET

Spotlight on Cruise & Ferry

SMM will support sustainability in the cruise industry ©Hamburg Messe und Congress / Michael Zapf

CRUISE & FERRY EFFICIENCY UPGRADES

Sustainability at SMM, AIDA Cruises continues to modernise its fleet, ABB modernises Amera and works with Arkitech to bring efficiency gains to MSC Magnifica, and GIT pioneers a sustainable coating solution.

Marine Interiors will show SMM is the foremost event for cruise and ferry operators ©Hamburg Messe und Congress / Michael Zapf

The cruise industry is under enormous pressure to improve its sustainability fast. SMM will deliver key input to support these efforts. Sustainability is a criterion in selecting ship interiors as well, as the exhibitors Marine Interiors will show. SMM is the foremost event for this segment of the European passenger shipping industry, and the only one that includes ferry interiors.

The Cruise Lines International Association's latest statistic counted over 31 million passengers, nearly 7% more than during the pre-Covid year 2019. But with these numbers comes increased responsibility: The cruise industry is faced with the challenge to reduce its emissions radically. Marie-Caroline Laurent, Director General of CLIA Europe, considers SMM as the perfect platform to drive the industry's sustainability goals. "CLIA is pleased to partner with SMM for the first time. This will be a key opportunity to network, share views about policy areas of common interest, and showcase the latest environmental advances in our industry that can benefit the entire sector," says Laurent. With this in mind, CLIA will present an investment plan for decarbonising the entire cruise industry at the flagship fair, along with energy efficiency enhancement solutions that are already used by cruise vessels. Sustainability and cruising are compatible – attendees at the new interactive CLIA exhibition 'The Voyage' are welcome to see for themselves (Central entrance, upper level).

"SMM showcases everything companies need to build state-of-the-art passenger ships, from engines and bridge technologies to water treatment systems, and through to interior outfitting," says Claus Ulrich Selbach, Business Unit Director Maritime and Technology Fairs at Hamburg Messe und Congress. "Our trade fair shows the full breadth and depth of the industry's know-how, lending fresh impetus to the discussion about forward-looking developments – you won't find this anywhere else."

Sustainable refitting

A cruiseship's operating life typically exceeds 20 years. Refitting these vessels at regular intervals allows owners to ensure the ships comply with the latest standards in terms of safety, efficiency and environmental compatibility. According to the supplier association VDMA, demand for ship upgrades is increasing: "The IMO carbon neutrality goal is certainly a strong driver of this trend," says Martin Johannsmann, CEO of SKF Marine, and Chairman of the Board of VDMA Marine Equipment and Systems. Ship interiors are renovated regularly, as well. The Italian De Wave Group is one of the experts in this field. It recently gave a new look to the Arabian cruise ship *Aroya* and will showcase other projects in the MARINE INTERIORS @SMM area.

In early 2024, the Danish owner DFDS invested €10m in refitting its ferries *King Seaways* and *Princess Seaways*. "What I love most about refitting projects such as these is to see the metamorphosis of the ship," says Teun-Wim Leene, Route Director at DFDS. "We begin with the product our customers have known for years – we take it apart, go back to the beginnings, and develop a new experience from it." DFDS will also be featured on one of the SMM Ferry Panels. Its title: *Introducing eco-friendly fuels on passenger ships – retrofits and newbuilds*. Other members on the panel will include representatives of Stena Line, DNV and the German nature conservation society NABU.

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AIDA Cruises is continuing to modernise its fleet with *AIDAluna* going into Chantier Naval shipyard in Marseille from October 22 to December 10, 2025 – followed by *AIDAbella* (inset) from January 21 to March 11, 2026

SPHINX SHIPS MODERNISATION

AIDA Cruises is continuing to modernise its fleet: After *AIDAdiva*, the shipyard times for the next two ships of the Sphinx class have now been set.

As part of AIDA Evolution, the largest fleet modernisation programme in the company's history, the first three ships in the Sphinx series will be extensively modernised by 2026. The first to go is *AIDAdiva*, which will go to the Chantier Naval shipyard in Marseille, France, from February 3 to March 22, 2025. The shipyard times for the next two ships have now also been set: *AIDAluna* will complete its shipyard period from October 22 to December 10, 2025 and *AIDAbella* will follow from January 21 to March 11, 2026.

New interior design and services

The focus of the modernisation during the seven-week shipyard period is on improved ship technology and even more variety of experiences, service and comfort. Popular concepts from the latest AIDA generation will also be brought on board. All guest cabins will have a new look. In addition, the range of suites will be expanded. For the first time in this ship class, exclusive areas and services will be created. The Theatrium will also be refurbished and new activity areas will be created especially for families with children.

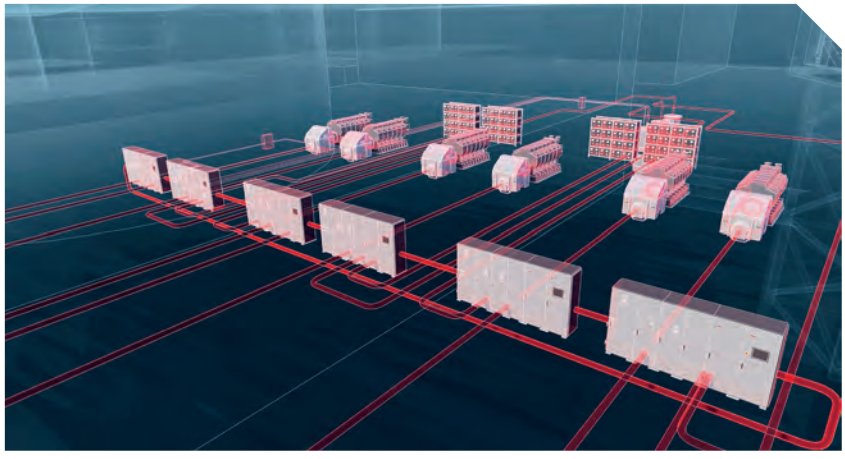
ABB's shore connection system will help reduce emissions during port calls

ABB MODERNISES AMERA WITH DC TECHNOLOGY

To further improve the efficiency and sustainability of its fleet, Germany-based cruise operator Phoenix Reisen has modernised its 205m, 835-passenger capacity ship *Amera*. The vessel is now equipped with ABB's Onboard DC Grid power system platform and shore connection for improved efficiency and safety, as well as lower emissions. Following successful commissioning and sea trials, *Amera* has become the first cruiseship retrofitted with Onboard DC Grid.

The turnkey project involved the replacement of the vessel's AC system with modern DC technology. As a DC-based power distribution system, Onboard DC Grid allows the simple and cost-effective integration of energy sources and loads in a compact, lightweight and functional setup. The key benefits include safer and more efficient vessel operations thanks to the system's high fault tolerance. In addition, the vessel is future-proofed as it can be equipped to allow efficient integration of new, low-carbon energy sources such as batteries and fuel cells. This will also support operations in emission control areas such as the Norwegian fjords.

"Our aim is to be a leader in sustainable cruising, providing unforgettable travel experiences in some of the world's most beautiful locations while protecting fragile local ecosystems," said Johannes Zurnieden, Founder and CEO, Phoenix



Above: *Amera* is the first cruise ship to be retrofitted with Onboard DC Grid

Below: The *Amera* at Remontowa in early 2024

Reisen. "We are working towards more efficient and environmentally-friendly operations across our fleet, and having completed the modernisation of *Amera* together with ABB, we are confident we are on the right track to achieve this objective."

ABB's shore connection system will help *Amera* reduce emissions during port calls. Typically, shore connection can help to reduce cruiseships' daily emissions by 35% when they are docked eight hours per day. Meanwhile, the onboard power setup will be managed by ABB's integrated PEMS power and energy management system, which will ensure optimal use of the vessel's power resources.

"At ABB, we are fully committed to working with customers toward electrification," said Tomas Arhippainen, Head of Marine Service and Digital, ABB Marine & Ports. "Modernisation projects, in this case converting the complete power plant from AC to DC and integrating shore connection technology, play a significant part in those efforts. *Amera* is the first cruiseship to be retrofitted with Onboard DC Grid, making this a milestone project for us, Phoenix Reisen and indeed the cruise industry as a whole," he added. "This project proves that the benefits of increased efficiency and safety are available not only for newbuild, but also for existing vessels."

ABB's full scope of supply comprises drives, motors and generators, transformer, PEMS, automation technology and shore connection.

"OUR AIM IS TO BE A LEADER IN SUSTAINABLE CRUISING."

A collaboration between ABB and Arkitech has brought significant efficiency gains for *MSC Magnifica*

COOL EFFICIENCY GAINS FOR *MSC MAGNIFICA*

A collaboration between ABB and Arkitech has brought significant efficiency gains for the heating, ventilation and air conditioning (HVAC) system on board *MSC Magnifica*. Using artificial intelligence and machine learning to analyse data from over 1,500 sensors on the MSC Cruises ship, this technology enables up to a 12% increase in chiller efficiency to achieve monthly energy savings of 100MW by the 15-year-old ship while maintaining optimal air-handling unit performance.

The HVAC systems onboard cruiseships and ferries are often one of the largest energy consumers after propulsion, making energy efficiency a priority. The ABB solution based on ARK-M20 is designed to minimise the cost and environmental impact of this system. It works by continuously optimising the HVAC system's temperature set point in response to variable conditions including weather, seawater temperature, mobility, proportion of passenger capacity filled, time of day and position in port or at sea.

"Controlling the most energy-demanding processes onboard – propulsion, hotel operations and HVAC – is increasingly important," said Ivana Melillo, Head of Energy Efficiency, MSC Cruise Management (UK). "Reducing energy needs can decrease fuel consumption and emissions. Thanks to the project, we expect to save 10-12% of HVAC energy consumption, equating to nearly one ton of fuel saved daily. The greatest emissions savings come from the fuel we don't use."

"As maritime organisations seek to enhance operational efficiency and reduce their carbon footprint, innovative technologies like ARK-M20 are well positioned to support this growing demand," said Alessandro De Santis, Manager – Service Area South Europe, ABB Marine & Ports. "Our collaboration with Arkitech and MSC Cruises emphasises our commitment to delivering measurable energy savings and operational improvements through technology. The project's success is yet another testament to our leadership in advancing efficiency and sustainability in the maritime industry."

> "THE RESULTS ACHIEVED BY OUR ARK-M20 SYSTEM ONBOARD *MSC MAGNIFICA* EXCEEDED OUR INITIAL TARGET, EQUATING TO ENERGY SAVINGS OF 100MW PER MONTH AND AN ANTICIPATED 1,600-2,000MW PER YEAR."

Plug-and-play

Supplied in a modular plug-and-play configuration, the ARK-M20 system can be installed seamlessly during normal vessel operations to offer a platform to monitor vessel air quality. As well as providing a safe and comfortable environment for passengers and crew, optimising HVAC performance contributes towards compliance with regulations such as the International Maritime Organization's Carbon Intensity Indicator.

"The results achieved by our ARK-M20 system onboard *MSC Magnifica* exceeded our initial target, equating to energy savings of 100MW per month and an anticipated 1,600-2,000MW per year," said Sander Huijer, CEO Arkitech. "We are grateful to ABB for its support in a project which demonstrates the efficiency gains, cost savings and emissions reduction that can be achieved without compromising performance or guest and crew comfort."

PIONEERING SUSTAINABLE INNOVATION

Graphene-based coatings manufacturer GIT Coatings (Graphite Innovations & Technologies Inc) and Australian cruise line Coral Expeditions have entered an official agreement to use a combination of robotic hull grooming and graphene-based hard foul release coatings on the 120-passenger vessel *Coral Adventurer*, marking a first for the global cruise industry.

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In April, Coral Expeditions' *Coral Adventurer* was initially coated with GIT's graphene-based hard foul release coating. Its hull was coated with XGIT-FUEL and its propellers with XGIT-PROP.

XGIT-FUEL is a graphene-based hard foul release hull coating that creates an ultra-low friction surface to increase vessel efficiency, and its patented XGIT technology secures a hydrated layer that deters the settlement and attachment of biofouling. It was also recently adopted by leading Finnish passenger shipping operator Finnlines across its ro-ro and ro-pax fleets.

XGIT-PROP is a highly durable graphene-based hard foul release propeller coating that helps to improve vessel performance by keeping the propeller smooth over time. It is the most efficient and simplest way to improve CII ratings. In March, leading dry bulk company Pacific Basin adopted the coating across its entire fleet.

During the application process, Coral Expeditions MD Mark Fifield emphasised the extended lifespan of coating and resulting reduced maintenance intervals and consistent performance throughout prolonged operational periods due to an ultra-low friction surface out of dock.

He also registered the importance of the biocide-free aspect of GIT Coatings' sustainable foul release technology, which does not leach any toxins such as copper and silicone oils into the ocean. He further noted the reduction of carbon emissions due to the low friction provided by the mechanical makeup of the performance paint.

"These advancements exemplify Coral Expeditions' dedication to pioneering sustainable practices within the expedition cruising sector," says Fifield. "*Coral Adventurer* is leading the charge towards a brighter future for marine technology."

Pioneering shift

Coral Expeditions was looking to use a biocide-free coating, paired with a grooming solution, to keep the hull free of fouling over time while adhering to biofouling regulations. Implementing this process resulted in *Coral Adventurer* spending less time in drydock, ensuring it remained on schedule for cruise passengers. Working in collaboration, GIT and Coral Expeditions devised a grooming schedule that was easy to maintain and aligned with the company's operations.

"This represents the future of marine coatings," says Mo AlGermozi, CEO of GIT Coatings. "We are pioneering a shift towards more sustainable

***Coral Adventure* was initially coated with GIT's graphene-based hard foul release coating in April this year**

operations, eliminating toxic biocides and silicone oils, while maintaining peak performance. Additionally, we are overcoming the durability limitations of traditional silicone technologies. Our partnership with Coral Expeditions will showcase the transformative potential of the real sustainable coatings industry."

The Australian Hull Biofouling Management Regulation now in effect has established new requirements for managing biofouling on international vessels arriving in Australia. Operators of all vessels subject to biosecurity control will be required to provide information on how biofouling has been proactively managed prior to arriving in Australian territorial seas. The aim is to minimise the transfer of invasive species via ship hulls.

As the project marks three months since the application of the hard coating to *Coral Adventurer*, Coral Expeditions has confirmed that it will be proceeding with a grooming robot to keep the vessel clean.

SMM: #1 for innovation

The maritime economy is in the midst of the green transition, and advanced technologies are the enablers of this sweeping transformation. At SMM, international exhibitors will showcase the latest products and ideas paving the way into the future of shipping.

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SMN

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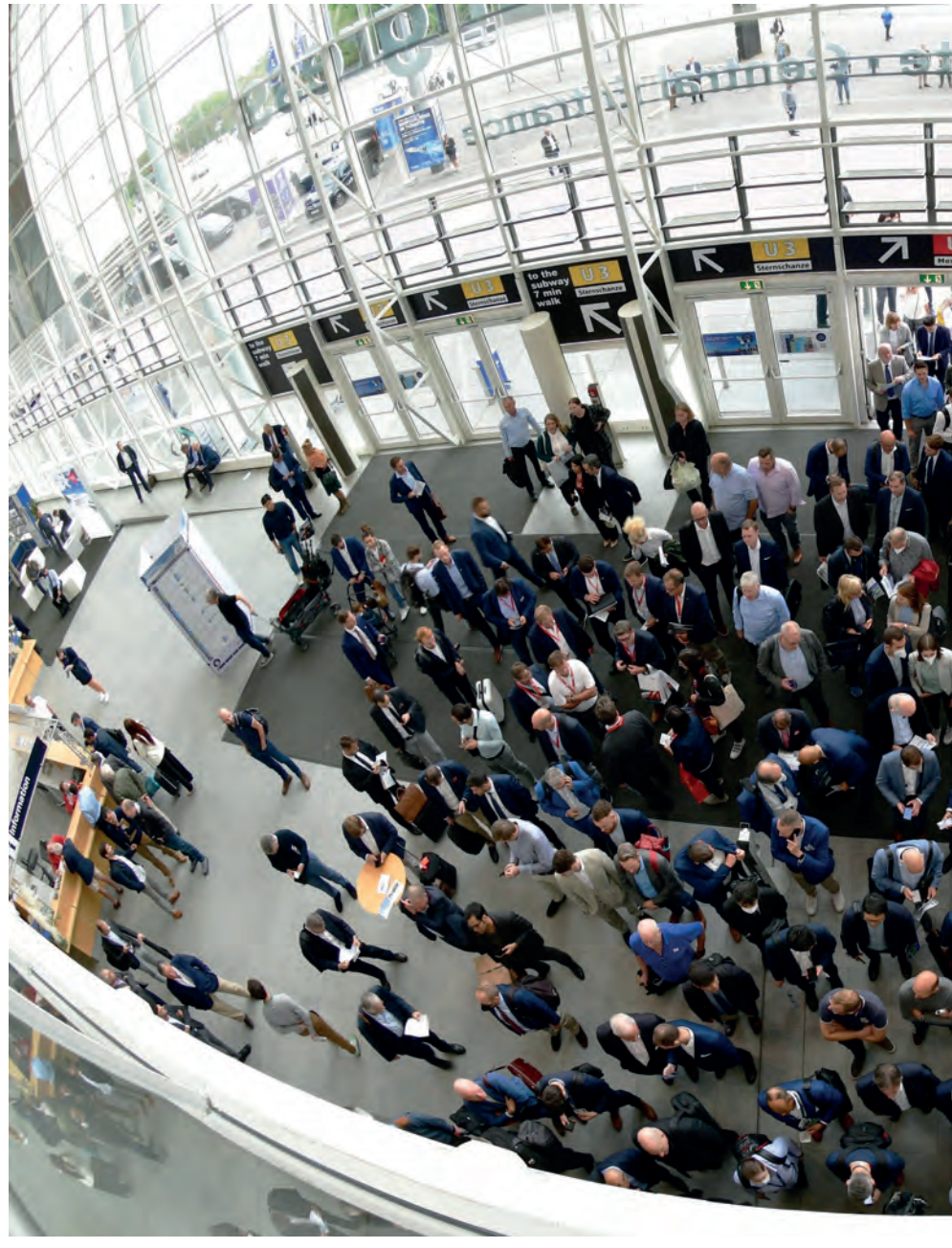

From windjammers to steamships, and then to diesel engines – the maritime industry has had to re-invent itself at several instances in its history – but never has it seen change as radical as today. "Decarbonisation offers the industry the historic opportunity to take a leading role in the global efforts to combat climate change. It is an unbelievable innovation driver," says Claus Ulrich Selbach, Business Unit Director Maritime and Technology Fairs at Hamburg Messe und Congress. At SMM, from 3 to 6 September, exhibiting companies will demonstrate in a compelling way how innovative solutions can increase efficiency, cut emissions and improve safety and security at sea. "Through new formats and exhibition sections, such as the Future Fuels Area, we want to give a boost to the innovative capabilities of our industry while establishing SMM as the key platform for sustainable maritime technologies," says SMM Director Christoph Lücke.

Future fuels: not an option but a must

In the new Future Fuels Area, Genevos, the award-winning French developer of hydrogen-based energy systems, will

highlight its recently-certified 250kW H2 fuel cell module (HPM-250) for maritime applications. “Our modular drop-in solution offers high scalability and redundancy, whilst operating with no vibration, reducing maintenance requirements and conforming to zero emission regulations,” says Phil Sharp, CTO and co-founder of Genevos.

The Norwegian manufacturer Bergen Engines will promote its new engine generation. “The ready-to-sell offering of a 25% hydrogen blend engine is a testament to our dedication to providing cleaner and more efficient energy solutions. We are proud to offer our customers engines that not only meet their performance needs but also contribute to a greener future for our industry,” says Jon Erik Røv, Managing Director. Roughly 20 companies are participating in the Future Fuels Area.

Refitting: upgrading the fleet in service

Demand for eco-friendly and energy-efficient ships is increasing steadily, and refitting the fleet in service is a major topic for shipowners. It also harbours substantial business opportunities

> THERE ARE INTRIGUING RETROFITTING OPTIONS, INCLUDING INVENTIONS LIKE THE ESAILS OFFERED BY THE SPANISH START-UP BOUND4BLUE.

for shipyards and component manufacturers. There are intriguing retrofitting options, including inventions like the eSails offered by the Spanish start-up Bound4Blue. "Our solution enables shipowners and operators to reduce their environmental footprint while cutting fuel costs. Because 'good for the planet' can also mean 'good for your business'," says co-founder and COO Cristina Aleixendri. Her company's wind-assisted propulsion solution can reduce fuel consumption by up to 10%.

The rotor sail, also called Flettner rotor, could be called the mother of all wind propulsion technologies. The Finnish company Norsepower has developed a radically modernised version of a concept originally invented in Germany roughly 100 years ago. "Thanks to high-tech materials and sophisticated automation, our Norsepower Rotor Sails have become a key technology for decarbonising global shipping. They are both powerful and reliable," says CEO Heikki Pöntynen. For example, during their first year of operation on board tanker *Maersk Pelican*, these rotor sails reduced fuel consumption by 8.2%.

Digitalisation: heading for autonomous shipping

Integrating digital technologies is the second big item on the maritime industry's agenda. Innovation is advancing at breathtaking speed. "From automation of wind-assisted propulsion devices to rapid, error-free energy management, we want to discuss at SMM how standardisation can support increased safety and fair competition, and we are looking forward to receiving feedback on our autonomous shipping technology," says Ronald Epskamp, Maritime Business Unit Manager at automation specialist Bachmann electronic.

Autonomous shipping is on the menu of Avikus too: The classification society Korean Register has confirmed that the solution sold by the Korean software house does save fuel. "This certification is significant in that it proves that it is possible to actively respond to carbon emissions regulation through the use of autonomous navigation technology," says Avikus CEO Lim Do-hyeong. "Autonomous ships represent

Demand for eco-friendly and energy-efficient ships is increasing steadily
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Artificial Intelligence

Artificial Intelligence (AI) is definitely a game-changer for the industry. This is why SMM is putting this technology front and centre this year. The new AI CENTER will be an all-embracing showcase of advanced AI technologies and their potential for maritime applications. Numerous established and start-up companies will present their AI solutions addressing a variety of challenges, from optimising fuel consumption to improving operational efficiency. One of them is Bearing AI, a Silicon Valley company established in 2019. "Our vision is to not only ease the industry's transition towards green shipping but also enable it to harness AI to make confident decisions that support commercial and sustainability goals," says Kristofer Maanum, Senior Product Leader at Bearing AI. Global players such as Hapag-Lloyd and K Line are already using this software.

But their economic success also depends on efficient port logistics. This is where Conbo.ai wants to start a revolution of its own. To avoid backups at terminals and in their immediate surroundings, the American-Israeli company offers a traffic analysis system that can significantly increase the operational performance of these key nodes of the global supply chains. "Our innovative solution delivers meaningful insights that help rationalise processes, reduce costs, increase revenues, improve safety and cut emissions," says Eran Pereg, CEO and co-founder of the start-up. As an added benefit, Conbo.ai uses existing camera systems at terminals. "Implementing our platform solution takes only a few days," explains Pereg.

"SMM addresses everything that matters for the future of the industry by highlighting a wide range of forward-looking innovations," says Claus Ulrich Selbach. "I am convinced that SMM 2024 will deliver a strong impetus for the transformation of the shipping sector."

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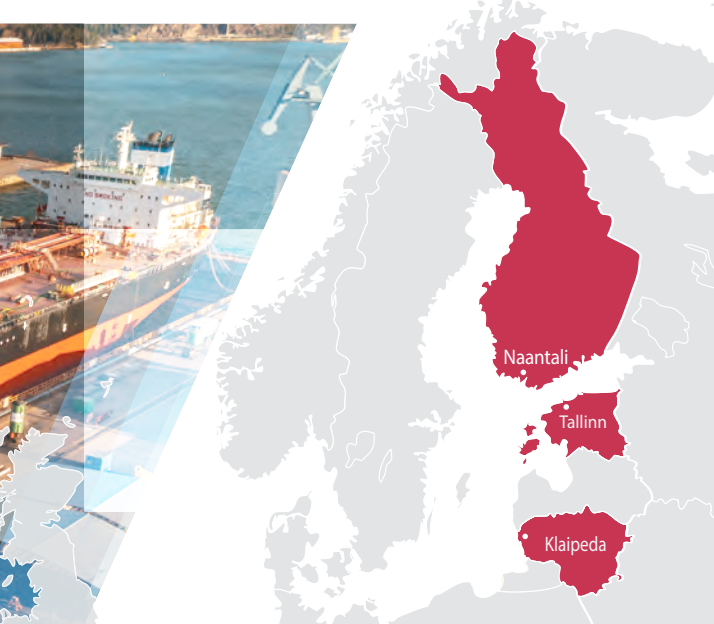


EVERY DETAIL MATTERS

Northern Europe in focus

BWTS installations at Remontowa, a mixed bag at Damen, a plug-in hybrid conversion by Wärtsilä, Schottel expands its thruster factory in Dörth, Germany and eCap Marine showcases its sustainable power generation technology.

Vaitere 2 left Remontowa Shiprepair Yard in Gdansk, Poland after conversion in May

The ro-ro general cargo vessel *Vaitere 2* left Remontowa Shiprepair Yard in Gdansk, Poland after conversion in May. The yard lengthened the ship by 15m, cutting the hull and inserting a 12m-wide, 180-tonne in-house-fabricated block.

The vessel was also fitted with many new systems: BWTS, ventilation, CO_2 gas extinguishing, pneumatic remote tank sounding system, and a manual sounding system installed in all the vessel's structural tanks, amongst others. The entire bridge navigation system was also upgraded.

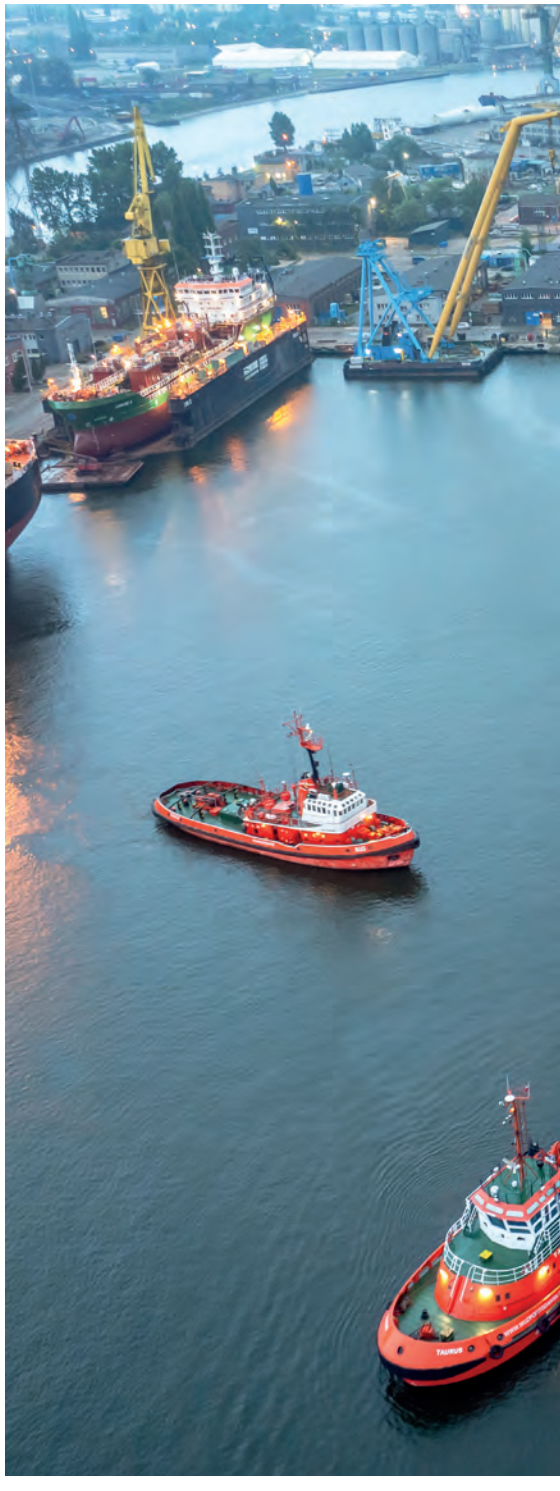
Remontowa also fabricated and installed new fuel tanks and a bunkering station so that the ship could transport, and discharge fuel to other ships and ashore. A new side ramp and its lifting and lowering system was also fitted.

After conversion, the *Vaitere 2* is a versatile and multi-purpose vessel capable of transporting containers, cars, fuel, and pallets of goods at a service speed of 12kt. On July 11, it called at Papeete, on the island of Tahiti, ready for service in French Polynesia.

Survey work

The *Ameland* general cargo ship underwent its third special survey at Remontowa. In addition, the ship was fitted with a pre-swirl stator in the propeller area. A major challenge was fulfilling all the technical welding recommendations and reconstructing the stern tube plating elements. The refurbishment project also included preserving two cargo holds, the surfaces of which after UHP water jetting were painted with two coats of protective paint. The hull underwent standard maintenance, including painting of the holds, which was preceded by renewal of steel in the tank tops and necessary work on the hatchcover hydraulics.

The containership *BF Caroda* entered Remontowa for class renewal. In addition, the yard applied an energy-saving solution on the CP propeller, covering all its blades with a silicone-based paint supplied by International Marine Coatings. The product keeps



the propeller free of all macro-fouling throughout the year, improving its efficiency and environmental profile since the paint does not use biocides, reducing fuel and maintenance costs. The ship's bow thruster, propeller hub and the OD-box were also overhauled. The bow mooring anchor windlass was completely stripped for machining, after which it was fitted with bronze bushes

Fionia Sea was retrofitted with new equipment and systems at Remontowa

and other improvements. Steel was also renewed in several places.

BWT retrofits

The LPG tanker *Gas Arjuna* was fitted with Alfa Laval's BWT system. Remontowa performed the full installation service, arranging the ship's space, prefabricating the pipelines, making and mounting the foundations, and installing all the system equipment and electrical connections. The second largest job was a comprehensive overhaul of the main engine, which included dismantling, inspections, repairs, and reassembly of key engine systems. Steel was also replaced in the ballast, fuel tanks and engine room, with over 15 steel inserts being applied in total.

The Italian-flagged chemical tanker *Barbarica* entered Remontowa for repairs to two shaftline bearings

Remontowa also completed the BWT system installation on the bulk carrier *AM Annaba*, which another shipyard had not finished. The ship was finally retrofitted with Ecochlor's EcoOne BWMS. It uses chlorine dioxide (ClO_2) treatment technology, which stands out for its low energy requirements. The main system equipment was installed in the deckhouse next to the ship's superstructure.

The ro-ro/cargo vessel *Fionia Sea* was retrofitted at Remontowa with new equipment and systems. The refurbishment, which lasted just one month, included a special survey, installation of a BWT system, prefabrication and mounting of new fenders, steel repairs to the stern ramp and decks, silicone application, and propulsion system overhaul.

The hull underwent a comprehensive recovery process, refreshed by new steel in many places. The stern ramp also gained new steel, which entailed removing, repairing and replacing the hinges. Steelwork was also required in the decks and funnel tops.

Remontowa comprehensively overhauled two rudder systems including blade removal, two steering gears and two propellers with hubs. An additional task was the overhaul of the stern thruster and replacement of the seals of the ship's stabilisers. The seals were also replaced in the two main engines' gearboxes.

Tanker winterisation

Altera's *Aurora Spirit* and *Rainbow Spirit* E-shuttle tankers underwent winterisation at Remontowa, enabling them to operate in icy conditions. The yard installed steam pipelines in the pump room, bow thruster room, steering gear room, engine room and VOC modules. The scope involved extensive electrical work, including laying new cables, installing switchboards and transformers, and mounting a new pressure-vacuum valve heating system. Doors and air chambers have also been adapted by fitting them with additional insulation and heating systems. In total, several kilometres of cables and piping were installed.

The Italian-flagged chemical tanker *Barbarica* entered Remontowa for repairs to two shaftline bearings. Once the shafts had been dismantled and their condition verified, it became apparent that the bow and stern bearings needed to be replaced. Remontowa machined the shaftlines, fitted new bearings and an air chamber seal lubrication system and reassembled them inside the vessel.

Two propeller hubs, shaft generators, and alternators were also overhauled, and the cargo tanks were preserved with special MarineLine paint. The anchor and mooring winches underwent extensive work with the chains being dismantled and renewed. The free-fall lifeboat davits and provision davits, including the hydraulic cylinders, underwent repairs on deck. Remontowa renewed the box cooler covers and installed an innovative system that sprays special chemicals on them to prevent the hull from becoming overgrown with algae. The accommodation spaces were also renovated. Whilst in dock, the ship underwent maintenance and was protected by the application of a new antifouling coating.

The Italian tanker *Ottomana* also entered Remontowa for repairs to its main engine and auxiliary units. The

yard tuned up the main engine's speed governor whilst also overhauling the fuel system and injectors on the auxiliary units. Other tasks included removing the lifeboats for maintenance, repainting the port name on the transom due to a home port change, and repairing the lining on the incinerator.

VARIETY AT DAMEN SHIPREPAIR

The seagoing tug *En Avant 30* was a recent visitor to Damen Shiprepair Oranjewerf. The main activities included the dismantling of the Schottel thrusters (both the upper and lower parts). These were lifted out of the dock using a mobile crane and transported to Schottel's workshop. After being overhauled, the thrusters were transported back to the yard and installed back into the ship.

The hopper dredger *Rio* also recently underwent an intermediate survey at the yard. Various work was carried out during this inspection docking, including steelwork, painting, dredging pipework, valves and thruster maintenance. One of these tasks was lifting of the hatchcover crane from the ship. After thorough cleaning and painting, it was replaced back on board.

In May this year, Damen's Harlingen yard welcomed Global Seatrade's cargo vessel *Atlantic* for a survey. The focus of

The seagoing tug *En Avant 30* was a recent visitor to Damen Shiprepair Oranjewerf

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the work was on boosting sustainability, so the *Atlantic* was hydrojetted and the hull coated with silicone antifouling and the propeller with Propspeed.

The resultant increase in efficiency is anticipated to deliver fuel savings of 8-10%.

Global Seatrade also chose to overhaul the entire controllable pitch propeller system – paving the way for the vessel to sail trouble-free for another 10 years.

Damen's Vlissingen repair yard recently played host to a regular visitor in the form of IT International Telecom's cable-laying vessel, the *IT Intrepid*, which docked at the yard for its seventh special survey.

The vessel was built by UK shipyard Swan Hunter back in 1989, and having been well cared for by its owners, is still going strong 35 years later.

"It's always nice to welcome a returning customer," says Damen Shiprepair Vlissingen Commercial Manager Jeroen Schotel. "It gives me the confidence we have understood their needs correctly and delivered a service to their satisfaction."

Tall ship renovation

The group's Dunkirk yard recently welcomed Communauté urbaine de Dunkerque's elegant *Duchesse Anne* for a five-month docking.

This graceful lady is a symbol of the city and the largest museum sailing ship in France. During its docking, 300 tons of concrete ballast will be removed, steelworks and a full sandblasting carried out along with repainting.

This comprehensive renovation programme is scheduled for completion in time for the Tall Ships Race 2025, which will take place in Dunkirk next summer.

Damen Shiprepair Rotterdam has recently welcomed two cruiseships. On June 19, the *Manara* – soon to be renamed *Aroya* – arrived. The vessel is owned by the first Arabian cruise line, Aroya Cruises, and is being refitted and upgraded for its inaugural voyage in December. After this, the vessel will provide an Arabian experience for its 3,400 passengers.

It was followed into dock by Oceania Cruises' *Nautica*. During an intensive nine-day period, the vessel underwent extensive upgrades and maintenance work to prepare it for the coming season.

Damen Shiprepair Brest has also seen its share of cruiseships and LNG carriers from major players for maintenance and refit work.

Damen's Dunkirk yard recently welcomed the *Duchesse Anne* for a five-month docking

The hopper dredger *Rio* recently underwent an intermediate survey at Damen Shiprepair Oranjewerf

PLUG-IN HYBRID OPERATION CONVERSION

Technology group Wärtsilä will supply the electrical systems needed to convert two Scandlines ferries to a plug-in hybrid solution. The ferries operate on the Puttgarden, Germany – Rödby, Denmark route, and the conversion represents a key element in Scandlines' target to achieve emission-free operations on the route by 2030. The company's overall vision is to realise zero emissions on all operations by 2040.

The project involves replacing an engine and existing systems with a new shore-charged electrical system, including a large energy storage system. This will allow electricity to contribute approximately 80% of the energy needed for each crossing.

"We are so pleased to have the most important supplier in place, and we are very much looking forward to working with Wärtsilä and getting started with the conversion," says Scandlines' CEO Michael Guldmann Petersen. "With the plug-in hybrid ferries, we can get even closer to our goal of operating the Puttgarden-Rødby route emission-free by 2030."

Wärtsilä will engineer and deliver the hybrid converters, the energy storage system (ESS) and the energy management system (EMS), as well as the switchgears, transformers, the onboard port charger, and replacement components in the existing switchboard equipment. In addition, Wärtsilä will supervise the installations, carry out the commissioning, and provide preventive maintenance support services. The equipment is scheduled for delivery in summer 2025.

"We are excited to support Scandlines with their vision towards delivering environmentally sustainable transport options for the region," comments Roger Holm, President of Wärtsilä Marine and Executive Vice President at Wärtsilä Corporation. "Ship electrification is one of the solutions for marine decarbonisation and as the world's biggest conversion project of its kind, we can help Scandlines move closer to meeting their goal of making the route emission-free by 2030."

The two Scandlines Ro-Ro ferries selected for conversion to plug-in hybrid operation are the 142m-long *Deutschland* and *Schleswig-Holstein*.

Wärtsilä will supply the electrical systems needed to convert two Scandlines ferries to a plug-in hybrid solution

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THRUSTER FACTORY EXPANSION

Schottel GmbH is to expand its thruster factory in Dörth, Germany, to include a logistics centre with a capacity of around 4,000 square metres. Following several years of planning, a contract has now been signed with general contractor Goldbeck from Koblenz. The new building will be annexed to the existing facility and will provide 2,634 square metres of industrial floor space and 1,326 square metres of offices. The groundbreaking ceremony for the €7.5m structure is to take place at the end of this year, with Schottel moving into the new edifice at the start of 2025. Further company investments to the sum of €2m have been budgeted for the equipment that includes crane systems and a fully automated warehouse.

To date, goods for the construction of new ship propulsion systems and the spare parts business are handled in parallel in both Dörth and Spay, which are about 30km apart. "By getting rid of this double warehousing system we can vastly reduce the number of interfaces in internal logistics. The processing of incoming goods, order picking and the storage of supplies will become much more efficient," says Schottel's CEO Stefan Kaul, naming the immediate benefits. The timing was also perfect from another aspect. "Our service business and thus the need for spare parts are constantly growing. In the future, our international customers will profit from a noticeably higher availability of parts, also with unstable supply chains elsewhere," he adds.

Schottel GmbH is expanding its thruster factory in Dörth, Germany

ALTERNATIVE POWER SOLUTION

eCap Marine, a pioneer in sustainable maritime power generation technologies, is set to showcase its emission-free Hydrogen Power Generator H2PowerPac, at this year's SMM in Hamburg. The retrofit and hybridisation of one offshore supply vessel with eCap Marine's innovative H2PowerPac and H2Tank Systems successfully received the DNV Case-by-Case Approval in February 2024, highlighting much of the company's comprehensive engineering expertise.

The H2PowerPac, assembled in a 20ft container-shaped module, serves as an emission-free energy source for the vessel's extended propulsion, enabling it to navigate through the delicate environment of the Wadden Sea Nature Park in the North Sea. The delivered system comprises fuel cell systems, fuel control unit and a battery system for load levelling, along with swappable hydrogen tank systems, ensuring a sustainable and eco-friendly operation.

Hamburg-based eCap Marine has designed and engineered this H2PowerPac by also integrating power management, cooling, and fire extinguishing systems alongside various control and safety mechanisms. These features emphasise the company's commitment to providing reliable, safe, emission-free power generation solutions.

eCap Marine offers turnkey power generation solutions for both maritime and land-based applications. Its comprehensive technical support spans feasibility studies and technical design to system development, 'Plug and Play' delivery, and after-sales services.

In addition to the complete systems, eCap Marine provides customised hydrogen technology engineering to meet the individual requirements of each maritime industry client. These solutions, whether for propulsion systems or hotel loads, can be integrated directly into ships or implemented in a mobile container form, with or without a battery system.

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Robust markets and a steady stream of ESTs

In its recent half-yearly Shipping Review and Outlook, Clarksons Research documented strong market conditions across most major shipping segments over the past six months, with Red Sea disruption having a clear impact. In this Analysis, *Steve Gordon, Global Head of Clarksons Research*, summarises this review along with an update of ship repair data points from Clarksons World Fleet Register.


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Chart 1.1 Repair Yard Activity by Location in 2023ytd & 2022

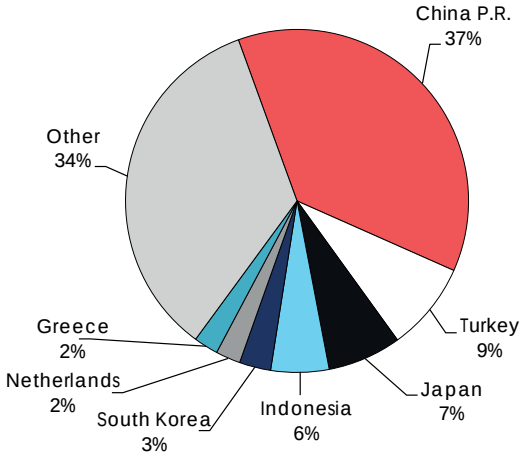


Chart 1.2 Total Refurbishment & Repair Events In 2023 By Repair Yard Country

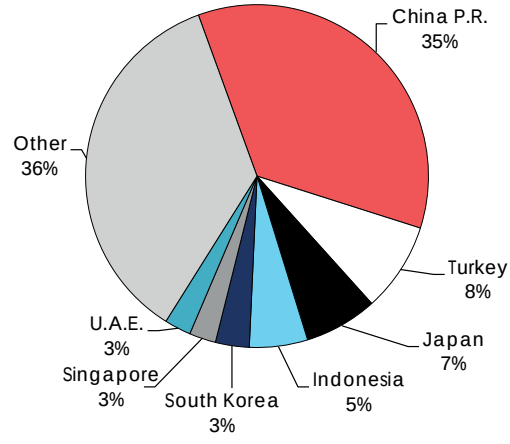


Chart 2 Refurbishment & Repair Events In 2024ytd In China By Province

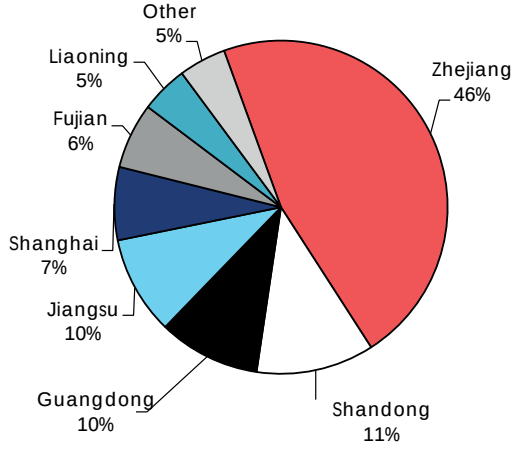


Chart 3.1 Refurbishment & Repair Events In 2024ytd By Country, N Europe, Med. & Black Sea Zones

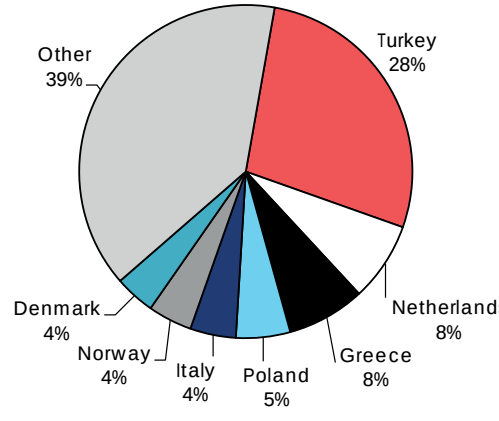


Chart 3.2 Refurbishment & Repair Events In 2024ytd By Country, N Europe Zone

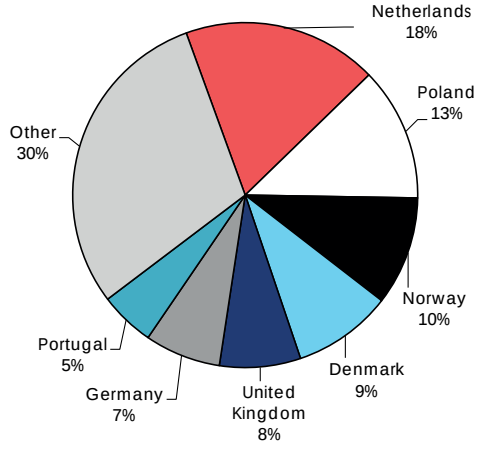
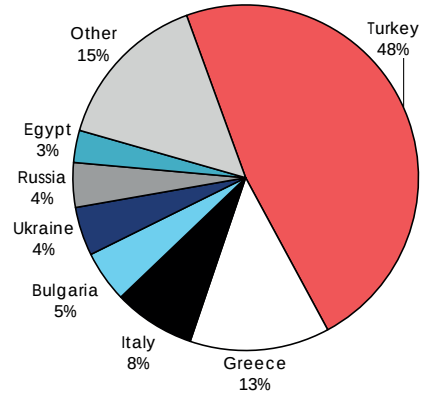


Chart 3.3 Refurbishment & Repair Events In 2024ytd By Country, Med./Black Sea Zone



Note: Includes special surveys, scrubber/BWMS retrofits, repairs, cruise refurbishments and other activity. Data as of July 2024.

It has been a half year of robust cross-market strength for the shipping industry, with our ClarkSea Index up 6% y-o-y ($25,498/day, 43% above the 10-year trend) and the bulk carrier and container sectors joining 'energy' shipping in positive territory. Underlying volume growth and major disruption to trade patterns have again been supportive, alongside supply constraints in some key markets.

Last year we gave top marks to 'energy' shipping, and the tanker market, supported by low fleet growth and redistribution of Russian oil flows, has again performed robustly, averaging $44,431/day (+98% on 10yr trend). Our chemical tanker index rose to an encouraging 43% above trend. In the gases, VLGC rates came off from record highs in 2023 (still a healthy $49,985/day), while our LNG short-term rate fell below trend amid softer gas prices and as the market absorbed tonnage while waiting for projects to come on line in the years ahead. Offshore oil and gas markets continued to strengthen (PSV +109% on trend), as did day rates in offshore wind markets. The bulker market increased 47% on 1H 2023, with our weighted average at $15,828/day, 25% above trend, after a surprisingly strong Q1.

But the biggest change in dynamic has come in containers, where a market that was expected to be oversupplied has tightened dramatically, first as Red Sea re-routing added to demand (+12% in TEU-miles) and then by improving volumes (~10% higher than at the start of the year), an earlier peak season and increasing congestion. Freight and charter rates are now the highest on record outside the Covid-19 era. Car carriers have eased slightly from all-time highs with concerns about tariffs.

After increasing by 2.4% last year, we are again seeing above-trend volume growth, and project trade will reach 12.6bn tonnes (+2.3%). China has been especially supportive, although inventories have grown in some bulk commodities. Significantly, we expect the strongest growth in tonne-miles (+5.1%) for >10 years and, while some of this is from underlying long-haul Atlantic exports, the majority of this distance 'kicker' is from geopolitically-driven disruption events.

Demolition volumes remain limited, with just 5.3m dwt of demolition reported in the first half of 2024. Combined with an uptick in shipyard output, the fleet has grown slightly above trend (+1.8% but with wide variations across segments) to 2.4bn dwt (1.6bn GT). Our newbuild price index increased 5% in 1H to the same levels as 2008 on a nominal basis, with investors looking closely at yard reactivations and expansions (China) and yard costs. Despite a good flow of newbuild orders, especially in tankers and gas and with interest in containerships picking up, the total orderbook grew only 4%. S&P activity has remained elevated ($26bn, >65m dwt, +3% y-o-y); asset prices are high in most segments.

We estimate that GHG emissions will tick up in 2024, heightening the pressures on regulators, while in the year so far newbuild orders with alternative fuels dipped to 41% of tonnage contracted. So despite the challenges and uncertainty of trade disruption, we are seeing cross-market strength in a hugely cash-generative period for the shipping markets.

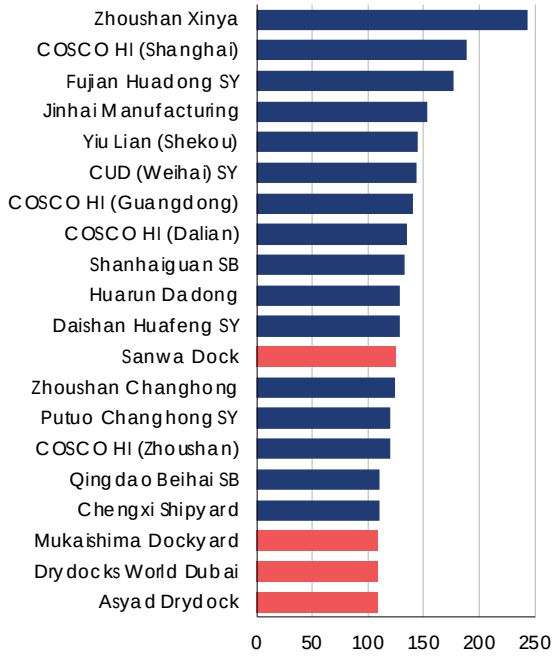
Ship repair review

China has continued to be the largest destination for ship repair work (see Charts 1.1-1.2), accounting for 37% of ship repair work carried out across Jan-Jul 2024 (full year 2023: 35%), followed by repair yards in Turkey with 9% and Japanese and Indonesian yards with 7% and 6% market share respectively.

Within China (see Chart 2), repair yards in Zhejiang province account for the largest share of work (2024ytd: 46%), followed by those in Shandong (11%), Guangdong (10%) and Jiangsu (10%).

Meanwhile, Turkey has a leading share of ship repair activity in the European region (see Charts 3.1-3.3), where it accounts for 28% of activity, while repair yards in the Netherlands and Greece both hold 8% market share, followed by Polish yards with 5%.

Chart 4.1 Repair Events By Repair Yard 2024ytd

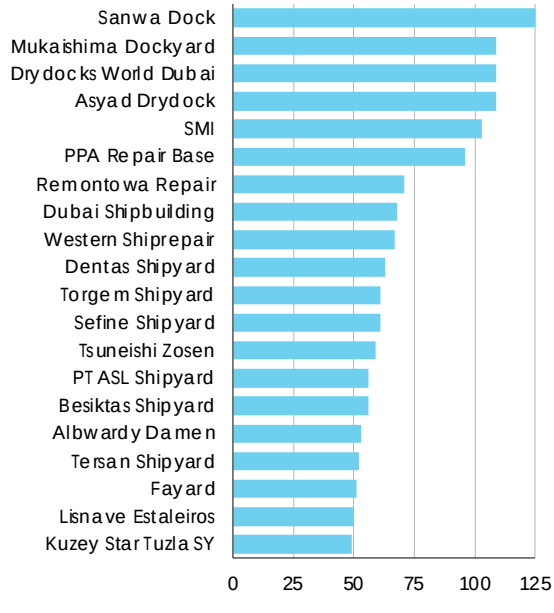


Total unique repair events in 2024ytd. Yards in red located outside of China. Data as of July 2024.

Chart 4.2 Repair Events By Repair Yard Group 2024ytd

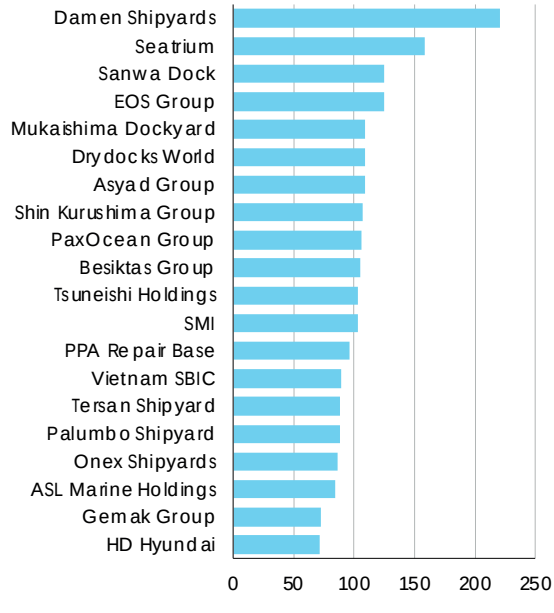
Total unique repair events in 2024ytd. Yard Groups in red based outside of China (total includes Chinese subsidiary yards). Data as of July 2024.

Chart 4.3 Repair Events By Repair Yard 2024ytd (Non-Chinese Yards)



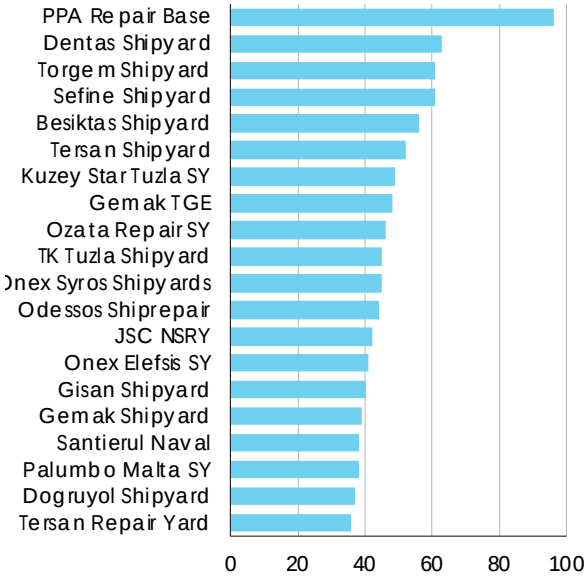
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 4.4 Repair Events By Repair Yard Group 2024ytd (Non-Chinese Yards)



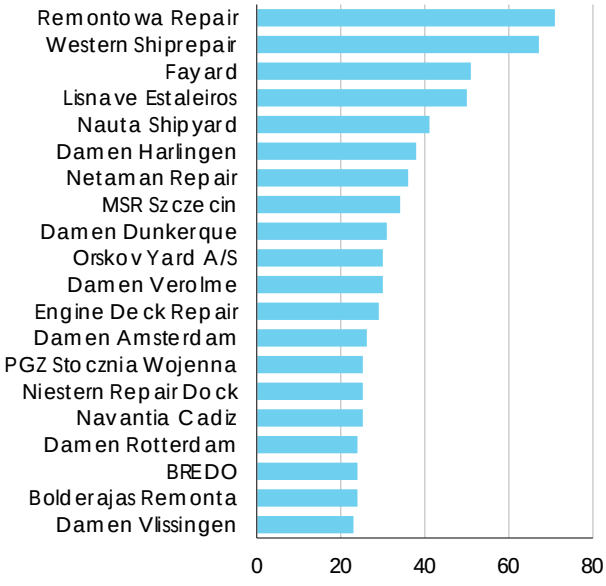
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 5.1 Repair Events By Repair Yard 2024ytd (Med./Black Sea Zone)



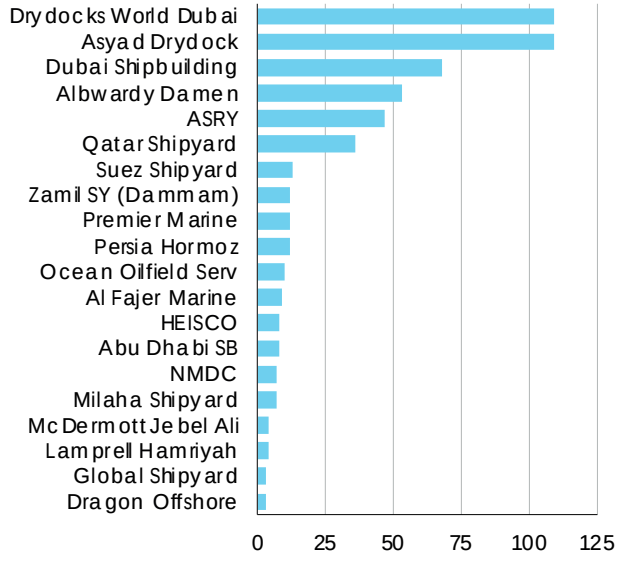
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 5.2 Repair Events By Repair Yard 2024ytd (Northern Europe Zone)



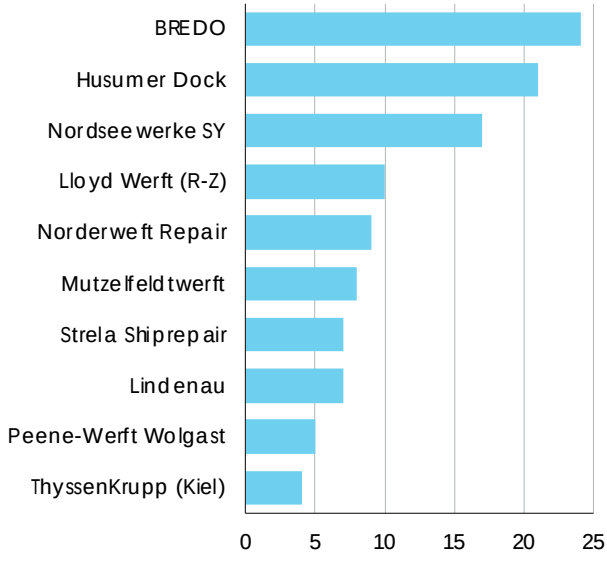
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 5.3 Repair Events By Repair Yard 2024ytd (Middle East Zone)



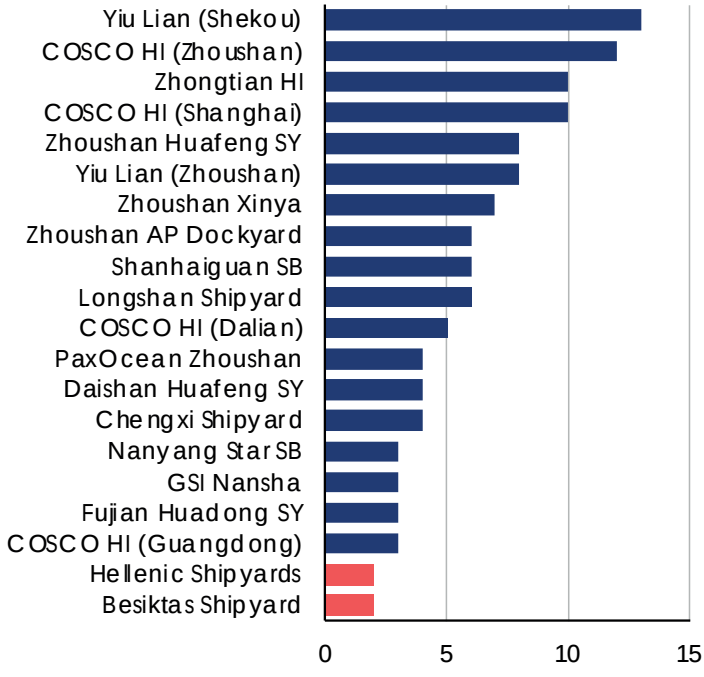
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 6 Repair Events By Repair Yard 2024ytd (Germany)



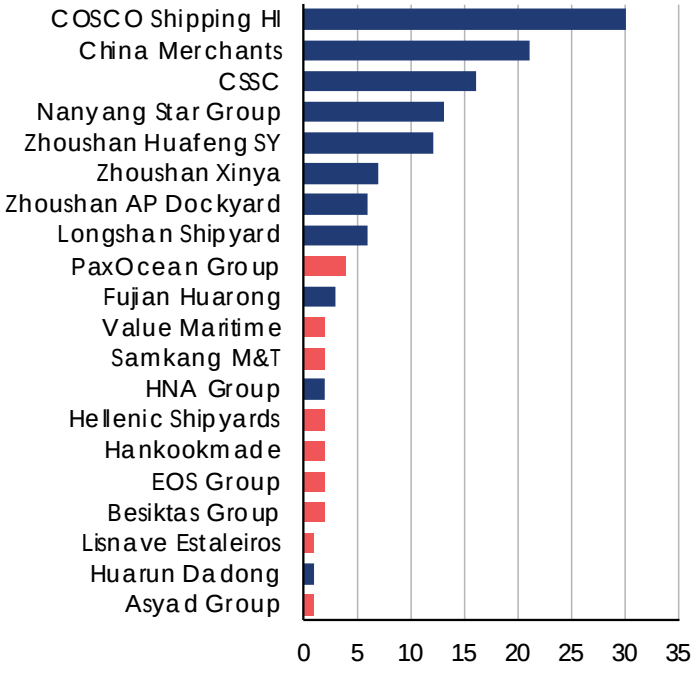
Total unique repair events in 2024ytd. Data as of July 2024.

Chart 9.1 Scrubber Retrofits By Repair Yard



Total scrubber retrofits in 2024ytd. Data as of July 2024. Yards in red located outside of China.

Chart 9.2 Scrubber Retrofits By Repair Yard Group



Total scrubber retrofits in 2024ytd. Data as of July 2024. Groups in red based outside of China (total includes work at Chinese subsidiary yards)

Charts 4.1-4.4 show a breakdown of ship repair activity at the most active yards and yard groups in 2024 so far, both globally and excluding China. Meanwhile, Charts 5.1-5.3 show ship repair activity in select areas of the world. Finally Chart 6 shows the 10 most active repair yards in Germany since start-2024.

Scrubber Retrofits

In 1H 2024, ~25 SOx scrubber retrofits were reported each month (see Chart 7), representing an easing in activity compared to 2023 (~40 month on average) and well below the peak pace of retrofit activity seen in late 2019 (>200 month) ahead of the IMO 2020 deadline. The slowdown in SOx scrubber retrofits comes despite a relatively consistent price differential between HFO and LSFO, averaging ~$100/tonne in 2023 and 2024 so far at Rotterdam (now ~$60/tonne), though generally firm market conditions across a range of shipping markets are likely encouraging owners to keep vessels trading rather than spending time at repair yards undergoing retrofits. Meanwhile, 25% of the orderbook in GT terms is set to be delivered with an SOx scrubber fitted, down from a peak of 48% in Sep-2019, reflecting the increased uptake of 'cleaner'-burning alternative fuels on newbuilds (~50% of the orderbook set to be alternative fuel capable).

Charts 9.1-9.2 show the breakdown of SOx scrubber retrofit events across the most active repair yards and repair yard groups in 2024 so far.

BWMS

The pace of Ballast Water Management System (BWMS) retrofits has continued to ease (see Chart 10) as the retrofit programme nears completion (~90% of fleet dwt now BWMS-fitted). Meanwhile, with shipping's 'Fuelling Transition' in focus, there continues to be a steady stream of EST (Energy Saving Technology) retrofits (>30 month in 2024 so far, similar to 2023). Overall, increased adoption of ESTs on newbuilds and the ongoing retrofit programme (see Chart 11) have brought EST uptake

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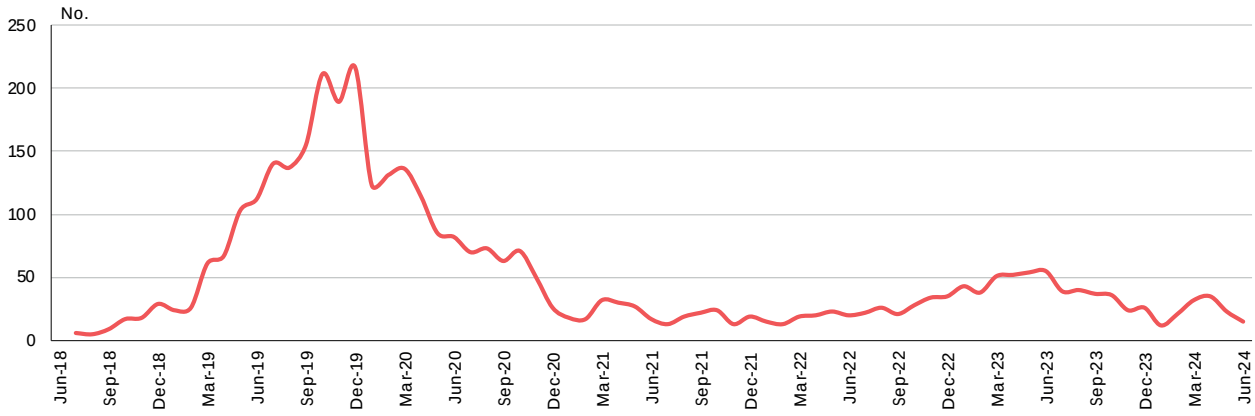
to over a third of the fleet by GT, with owners choosing from a variety of different ESTs (see Table 1). Meanwhile, the nascent ship fuel conversion programme has taken some early steps this year with the first containership methanol retrofits, while >20 ships are pending a fuel conversion. ■

Chart 7 Completed Scrubber Retrofits: Monthly Run-Rate



Total unique repair events in 2024ytd. Data as of July 2024.

Table 1

Equipment Group	Technologies	Example Projects	Vessels Equipped (Fleet & Orderbook)
Engine Room	Waste Heat Recovery Generator	Climeon, Alfa Laval, ABB, Hanwha, Calnetix Hydrocurrent	>145
	Fuel Emulsifier	FOWE, IPCO, Kawasaki	>175
Propeller	Propeller Duct	Becker Mewis Duct, Kawasaki, other in-house shipyard designs	>2,770
	Pre-Swirl Stator	DSME Pre-Swirl, CMES-Tech, SDARI, Wartsila EnergoFlow	>2,639
	Rudder Bulb	Kongsberg Promas, SDARI, Wartsila Energopac, other in-house shipyard designs	>3,492
	Propeller Boss Cap Fin	Imabari Shipbuilding Hybrid-Fin™, MMG escap, CMES-Tech, SDARI	>1,736
	Wake Equalizing Duct	Schneekluth WED, CMES-WID	>455
Deck Equipment	Flettner Rotors	Norsepower Rotor Sail, Anemoi Wind Engine	>40
	Suction Wing	Econowind, Bound4blue, Oceanbird	>43
	Rigid Sail	BAR Technologies, DSIC, AYRO, Oshima Shipbuilding	>18
	Wind Kite	Airseas Seawing	>4
Hull	Air Lubrication System	Silverstream, DSM ALS, Samsung SAVER Air, Alfa Laval, Mitsubishi MALS, Armada	>468
	Bow Enhancement (including Windshield)	Ulstein X-Bow, Damen Sea Axe, Kawasaki SEA-Arrow, other in-house shipyard designs	>2,443
	Elogrid	Elomatic	>7
	Hull Fin	Oshima Advanced Flipper fin, Namura NCF™ , Sanoyas Tandem Fin™, Japan Marine United A.L.V Fin	>819

Chart 10 Repair Yard Activity By Event Type

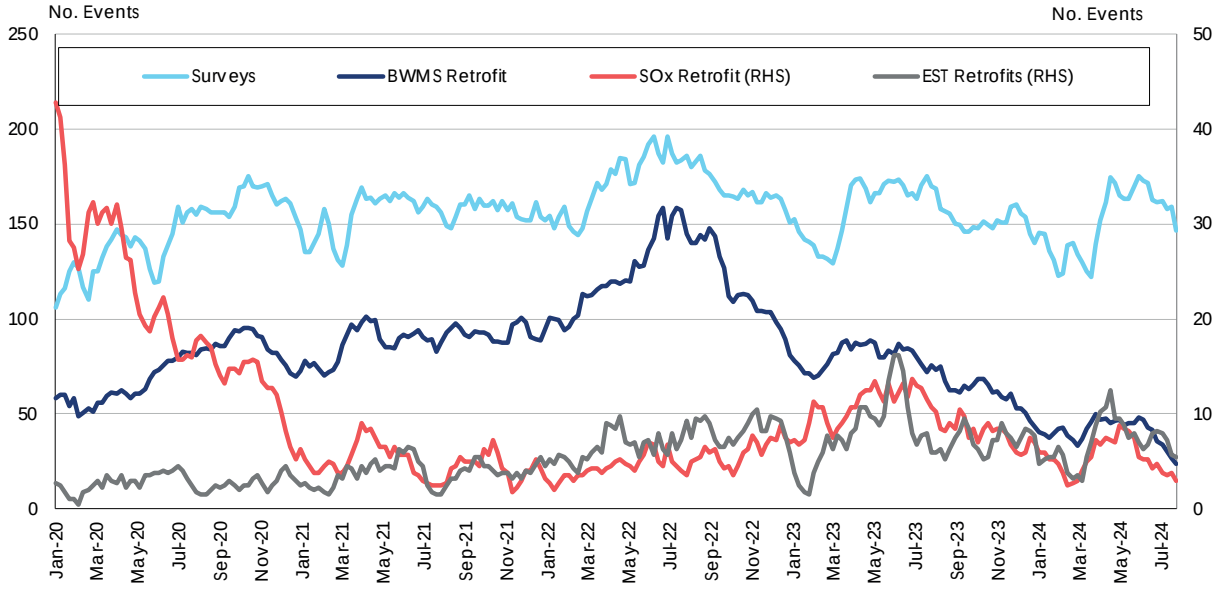
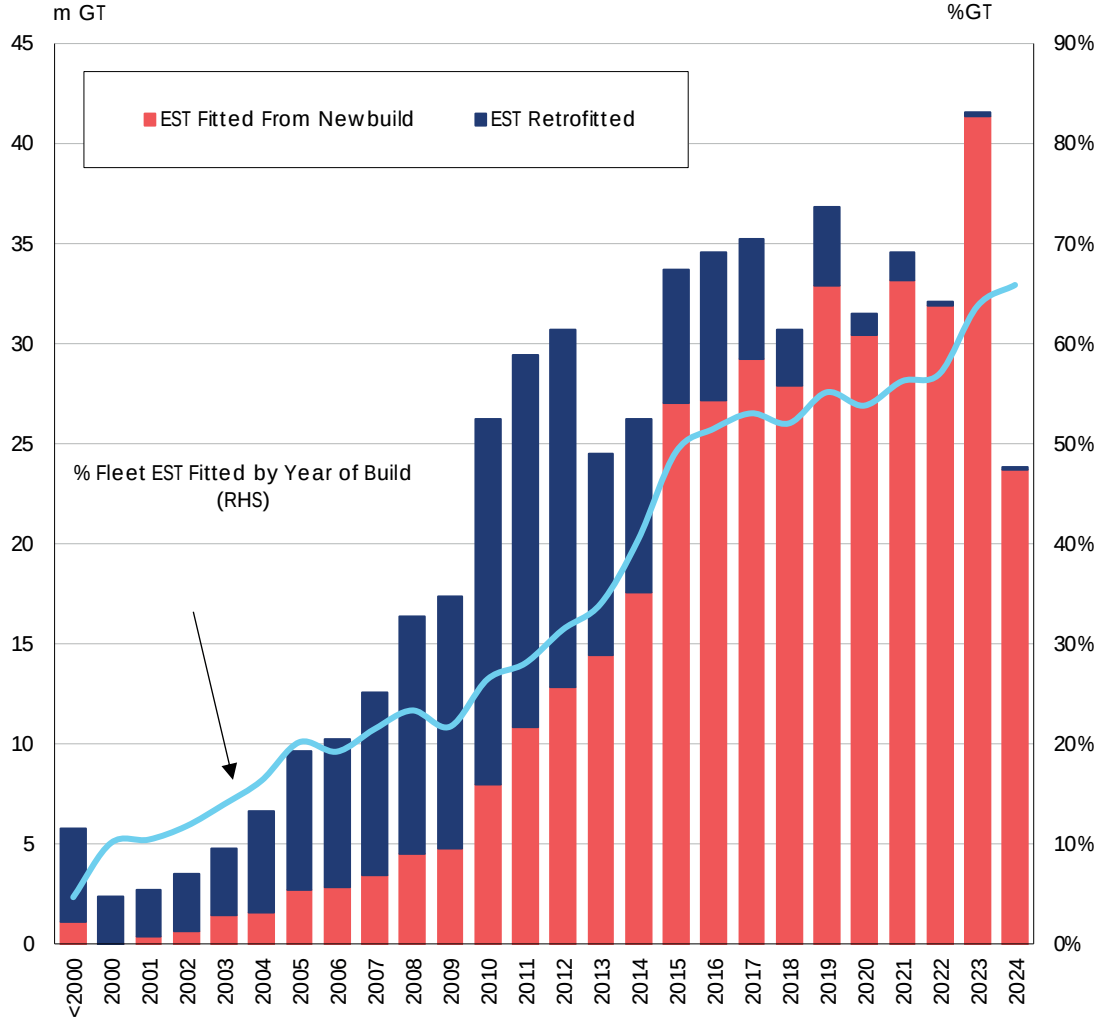


Chart 11



THE TRUE PRICE OF A BAD SEPARATION

Tests by water treatment specialists at RWO indicate how shipowners waste money when they are persuaded to use non-OEM filters in their oily water separator systems.

The International Convention for the Prevention of Pollution from Ships (MARPOL) sets specific demands for the water treatment equipment fitted on board ships of 400gt and above, including oily water separators (OWS).

The International Maritime Organization instrument limits effluent levels of water discharged into the marine environment to 15 parts per million, with specific classification notations applying a tighter 5ppm limit. To demonstrate their compliance, OWS systems must be tested and installed in line with the IMO's Marine Environment Protection Committee resolution MEPC 107(49).

For several original equipment manufacturers (OEMs), the OWS operation comprises two stages: the coalescence stage and the filter stage, which relies on active carbon filter cartridges.

In common with other areas of marine equipment, filter cartridges for OWS are available from OEM and non-OEM suppliers. The non-OEM parts are frequently cheaper, and as a result, many operators with challenging maintenance/OPEX budgets choose the non-OEM option in the belief that they are ensuring compliance with a similar-quality product for a lower cost.

However, while seeming to be equivalent, non-OEM parts will not have been subject to rigorous type approval performance testing. By choosing non-OEM filters, an operator is not only invalidating the guarantee but also the certification of the OWS, leading to a significant compliance issue. Non-compliance caused by using non-OEM spares may result, in certain circumstances, in hefty fines by administrations in the event of a pollution incident.

Beyond superficial similarities such as shape and colour, a close physical comparison of OEM and non-OEM filter cartridges can reveal key differences between the two. For example, OEM cartridges are heavier and more robust, with their smaller pores creating a smoother surface structure which offers superior oil capture.

Beyond the visual clues, tests show that OEM filters contain more active carbon, which ensures better performance and durability.

Test comparison

RWO conducted a performance test to compare its own cartridges with those offered by two non-OEM traders. The tests were carried out under the IMO type approval testing regime, with the effluent water analysed by an independent water laboratory to ensure impartiality.

With filter cartridge 1, the OWS reached the 15ppm effluent limit within 10 minutes of operation. A vessel operator might need to exchange the filter set more than 15 times to meet RWO filter performance. Filter cartridge 2, meanwhile, initially appeared to perform adequately, but here too effluent levels reached the 15ppm limit before the type approval requirement. In this case, the owner would need to exchange the filter set at least twice to meet RWO filter performance.

Even if non-OEM spares cost the operator half the price of those supplied by the OEM, RWO's test data indicates that the lifecycle cost of using non-OEM spares may end up being higher due to more frequent replacement – depending on bilgewater composition.

There are reports that several unauthorised distributors provide non-OEM spares that they claim are original, but where RWO cartridge filters are concerned, the real thing will always be recognisable by the RWO stamp on it as well as by its performance.

Those requiring replacements can be assured that genuine RWO cartridge filters are available worldwide. Furthermore, as well as ensuring that regulatory compliance is upheld, their efficiency protects the business interests of the user by minimising running costs, labour hours and downtime throughout the OWS lifecycle.

Sectional view of RWO and non-OEM filter cartridges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NATIONAL GEOGRAPHIC EXPLORER

Swift work from **MarineShaft**

Shaft repairs for the National Geographic Explorer and Stolt Bobcat.

MarineShaft recently completed a repair on the *National Geographic Explorer*, a vessel that sails in the waters of Antarctica during winter and the Arctic in summer. While in drydock in Denmark, onsite run-out measurements revealed deflections in both the propeller and intermediate push rods, each measuring about 12m long and 90mm in diameter.

The push rods were sent to MarineShaft's workshop in Hirtshals for cold straightening, a specialised process that restores bent shafts to their original condition without the need for heat.

This repair case also included the manufacturing of new push rod assembly flanges. MarineShaft's in-house facilities in combination with a large stock of raw materials ensured rapid manufacturing. The intermediate push rod was also modified with bronze liners, which were delivered from the manufacturer.

It took just four days for the work to be completed and receive class approval from DNV.

Propeller shaft liner replacement

Another recent repair case involved the manufacturing of a new bronze liner for the chemical tanker *Stolt Bobcat* in dock in Bulgaria. The owner had experienced some problems and started preparations prior to docking to ensure the delivery of the new liner would be completed within schedule.

As MarineShaft also carries a large stock of bronze liner materials, it was able to offer immediate manufacturing, providing its client with a beneficial delivery time.

It was decided that MarineShaft should remove the old liner, so the propeller shaft was sent to its workshop. After machining out the old liner, magnetic particle inspection was carried out to ensure the integrity of the tail shaft.

The new bronze liner, with a diameter of 455mm and a length of 3.315m, was shrink-fitted to the tail shaft and followed up by final machining of the bronze liner outside diameter to meet the control measurement.

The bronze liner being manufactured by MarineShaft

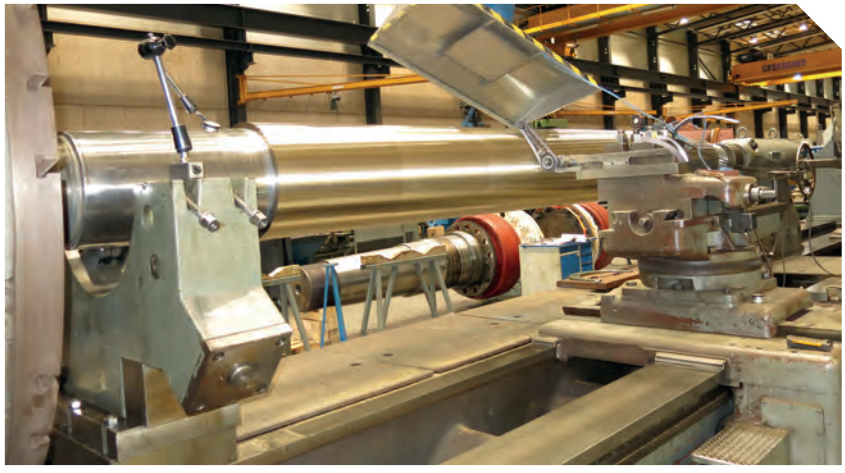
MarineShaft completed the replacement, which was fully class-approved by the LR surveyor, in only 11 days.

Cold straightening repair

Cold straightening of bent shafts is a significant cost- and time-saving repair option in the maritime industry. MarineShaft recently received two propeller shafts for cold straightening after run-out tests at the shipyard discovered a 0.30mm bend in the coupling end of both shafts.

The shafts had a diameter of 470mm and a length of 9.712m, with a flange diameter of 1.012m. Before and after the straightening process, non-destructive testing was performed to ensure the integrity of the shafts. The job was approved by RINA.

MarineShaft efficiently straightened both propeller shafts within just three days. The shafts were then corrosion protected, packed with an anti-rust film and wrapped before being loaded onto the truck for safe transport back to the ship.



The bronze liner being machined

Cold straightening process

MarineShaft is an expert in the field of cold straightening, which is a specialised process that restores bent shafts to their original condition without needing heat. It is a technique that is fully approved by all major classification societies. The process involves a hydraulic press capable of exerting up to 8,000 tonnes of force, allowing shafts ranging from 20mm to 1.5m in diameter to be straightened, regardless of length. This work requires significant craftsmanship and years of training.

The bent shafts were straightened, corrosion protected, packed with an anti-rust film and wrapped before being loaded onto the truck for safe transport back to the ship

The application of PPG SigmaGlide 2390 to the *Trito Navigator* took place at the Odessos shipyard in Varna, Bulgaria

In an era in which environmental responsibility is paramount, the shipping industry faces increasing pressure to reduce its carbon footprint.

Enhancing sustainability through **electrostatic coatings**

PPG SigmaPrime is applied as a base coat, followed by PPG SigmaGlide 790 as a tie coat, and finally the SigmaGlide 2390 as the top coat

ForestWave Navigation, a progressive shipping company established in 2011, recently embarked on a project that showcases the potential of innovative coating technologies and application methods to significantly enhance vessel sustainability. This case study focuses on the application of PPG SigmaGlide 2390 to the *Trito Navigator*, a general cargo vessel, using electrostatic application techniques.

ForestWave has rapidly grown to manage a fleet of 35 ships, primarily operating in European waters and the Atlantic Basin. The company's commitment to environmental stewardship led it to seek a hull coating solution that would reduce power consumption and carbon emissions, without the release of biocides into marine ecosystems.

The challenge was multifaceted: find a coating that could deliver superior performance in terms of power savings, fuel efficiency and emissions reduction, while also utilising an application method that minimised environmental impact during the coating process itself. This is where the PPG SigmaGlide 2390 system, applied via electrostatic spraying, proved to be the ideal solution.

PPG SigmaGlide 2390 is a silicone-based, biocide-free fouling release coating that incorporates PPG's innovative HydroReset technology. This technology creates an ultra-smooth hull surface with lower friction resistance, potentially reducing carbon emissions by up to 35%. The coating's ability to maintain its performance over time, with up to 150 days of idle time protection, addresses the growing need for solutions that can adapt to changing shipping patterns and increased port times.

However, the environmental benefits of PPG SigmaGlide 2390 extend beyond its in-service performance. The coating is designed to be compatible with electrostatic application methods, which represent a significant leap forward in sustainable coating practices. Electrostatic application works by negatively charging paint particles as they are sprayed, and are then attracted to the positive (grounded) hull surface.

The sustainability advantages of electrostatic application in comparison to traditional airless application are numerous and impactful:

- Increased transfer efficiency: Electrostatic spraying substantially improves the transfer efficiency of the coating process. Traditional airless spraying methods can result in significant overspray, with a considerable percentage of the coating not reaching the intended surface. Electrostatic application can achieve much higher transfer efficiencies, meaning more of the coating ends up on the hull where it's needed.
- Reduced material consumption: The higher transfer efficiency directly translates to reduced paint consumption. In the case of the *Trito Navigator*, ForestWave reported a noticeable15-20% reduction in material consumed.
- Improved worker safety: The reduction in overspray combined with the low VOC emissions of PPG SigmaGlide provide a much cleaner operation and an improved work environment for the applicators.
- Waste reduction: Less overspray means less waste generated during the coating process. You only have to look at the dock floors at the end of the project to see how much paint has been saved from disappearing into the environment. This reduces the environmental impact associated with waste disposal and cleaning processes in the shipyard.
- Saving time and costs: Electrostatic application can often be completed more efficiently than traditional methods. Due to the reduction in overspray and a cleaner operation, shipyards spend less time masking the vessel and covering the dock, saving valuable time and costs.
- Enhanced coating performance: The paint particles are precisely guided towards the grounded surface of the vessel, leading to an exceptionally

Electrostatic application of PPG SigmaGlide not only enhances the coating's inherent environmental advantages but also introduces a new level of sustainability to the application process itself

even particle distribution and the formation of a uniform and smooth film. This improved coverage and smoothness can enhance the longevity and performance of the coating.

The application of PPG SigmaGlide 2390 to the *Trito Navigator* took place at the Odessos shipyard in Varna, Bulgaria. The process involved blasting the hull to prepare the surface, applying PPG SigmaPrime as a base coat, followed by PPG SigmaGlide 790 as a tie coat, and finally the SigmaGlide 2390 as the top coat. The use of electrostatic application for the SigmaGlide layers ensured that the environmental benefits began right from the application stage.

The results of this innovative coating and application approach are expected to be significant. ForestWave anticipates that with PPG SigmaPrime on its hull, the *Trito Navigator* will be able to operate at an average of one knot higher speed, while remaining with a compliant Carbon Intensity Indicator (CII) rating. This improved performance is projected to contribute substantially to ForestWave's plans for meeting IMO greenhouse gas emission reduction targets over the next decade.

In conclusion, the case of the *Trito Navigator* illustrates how the combination of advanced coating technology and innovative application methods can yield substantial sustainability benefits. Electrostatic application of PPG SigmaGlide not only enhances the coating's inherent environmental advantages but also introduces a new level of sustainability to the application process itself. As the shipping industry continues to navigate the challenges of environmental regulation and sustainability expectations, PPG SigmaGlide will likely play an increasingly crucial role in shaping the future of marine coatings and vessel maintenance.

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MACGREGOR

Eduardo Prat, Head of Service Projects

With a core commitment to maintaining the operational safety and performance of its market-leading cargo- and load-handling solutions, MacGregor closely supports its customers from the design phase to the end of the vessel lifecycle.

However, when ships are confronted with the real-world challenges of maritime operations, regular maintenance is not always enough to keep them functioning optimally or in compliance with regulations, while certain systems may become obsolete during the vessel's normal lifespan. In such cases, MacGregor can offer a comprehensive range of service projects covering upgrade, conversion, modernisation, replacement, retrofit, refurbishment, and steel repair.

Enhancing safety, sustainability, and cost efficiency

Applicable to merchant and offshore vessels and systems including deck machinery, cranes, ro-ro equipmentand hatchcovers, MacGregor service projects aim to maximise the performance and lifespan of existing vessels. Projects range from minor modifications to major overhauls and include a turn-key service encompassing design, delivery, installation, and commissioning. Depending on requirements, they can be delivered as a standard package or a tailored solution.

"Shipowners today are always looking for ways to improve safety and sustainability in line with regulations while cutting costs," says Eduardo Prat, Head of Service Projects. "By upgrading a system or replacing it with the latest version, we help to make ships safer and more fuel efficient, with benefits for the environment as well as the owner's bottom line."

As an example of how service projects can enhance safety, Prat refers to the electrical interconnection of anchor windlasses – a project MacGregor is currently discussing with a major shipping company. "In a traditional set-up with the windlasses operated separately on opposite sides of the ship, if the windlass carrying the anchor fails after the anchor is dropped, the safety impact can be significant," he explains. "With the windlasses electrically interconnected at the bow, one acts as a back-up for the other, reducing the risk of an incident."

Other safety-oriented services provided by MacGregor include a mooring drum upgrade in which deteriorating brake rims are renewed with stainless steel to improve their performance and extend their service life. Prat also points to the upgrade of deck cranes into personnel-handling systems, which allows seafarers to be transferred safely from an auxiliary vessel to a tanker, for instance, with safety measures implemented based on class specifications.

In some cases, MacGregor's services directly address a specific regulation. For example, its Brake Test Kit service is a response to updated requirements for testing the load capacity of drum-band brakes following modification or repair. It applies to mooring systems from MacGregor brands – such as Hatlapa, TTS Kocks, and Pusnes – and requires only a minor modification.

Simple upgrade

Another relatively simple upgrade is the installation of MacGregor Soft Flaps on board ro-ro and ro-pax vessels. Applied to the end of the ro-ro ramp, Soft Flaps significantly reduce noise from embarking and disembarking vehicles, benefitting crew, passengers, port staff, and residents of port-adjacent communities. They are also easier to maintain and replace, and better able to withstand the impact of heavy vehicles than steel flaps, thus reducing total cost of ownership.

One of MacGregor's most effective services, Prat continues, is its variable frequency drive (VFD) upgrade for Porsgrunn steering gears. "In many cases, a vessel's steering gear is constantly in operation and therefore constantly consuming energy, but with MacGregor's VFD upgrade, it only works when needed to turn the rudder," he

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SAVING LIVES

Matty Harders, Manager Deck Machinery, Steering Gear & Compressors, Global Services

Geir Roland, Director of Service Projects

says. "In this way, the service enhances energy efficiency to cut both carbon dioxide emissions and operating costs."

According to Matty Harders, Manager Deck Machinery, Steering Gear & Compressors, Global Services, MacGregor's VFD upgrade exemplifies the company's more 'proactive' services. "We generally carry out service projects in response to a request from a customer to resolve a specific, often critical, challenge they are facing," he says. "The VFD upgrade isn't necessarily something a customer needs; rather, it's a practical and proactive measure they can take to reduce their environmental impact while saving money – a classic 'win-win' situation."

Harders adds that the service can cut annual vessel CO_2 emissions by 50 tonnes and yield a return on investment within 14-20 months.

Skilled and experienced global workforce

Since MacGregor exclusively offers service projects for its own equipment and that of its brands, customers can rely on engineers' in-depth knowledge of the system being serviced. With almost 50 international brands operating under the MacGregor umbrella, its equipment is on board around 40,000 vessels worldwide, meaning that approximately every second ship at sea may benefit from a MacGregor service project.

Geir Roland, Director of Service Projects, says the company's multi-brand, multi-divisional structure ensures its combined workforce possesses a comprehensive and diverse skillset.

He also emphasises that with personnel from so many makers and departments, the service project team is strong, has significant expertise, and offers a variety of perspectives to help MacGregor customers with their challenges. This allows the company to plan and execute a broad range of complex projects with consistent enthusiasm, proficiency and know-how.

Roland adds that MacGregor employees are highly experienced, serving the company for an average of 17-18 years. In addition, thanks to MacGregor's global service network, which comprises approximately 900 service specialists at ~ 40 service centres in 31 major ship-owning countries, projects can be executed wherever a customer requires support.

"Through our service projects, we provide any service the shipowner needs, however big or small, to operate their vessels as safely, sustainably, and cost-efficiently as possible – for as long as possible," says Roland. "Ultimately, the goal is to extract maximum value from existing vessels by boosting their performance, facilitating their ongoing regulatory compliance, and extending their lifespan." ■

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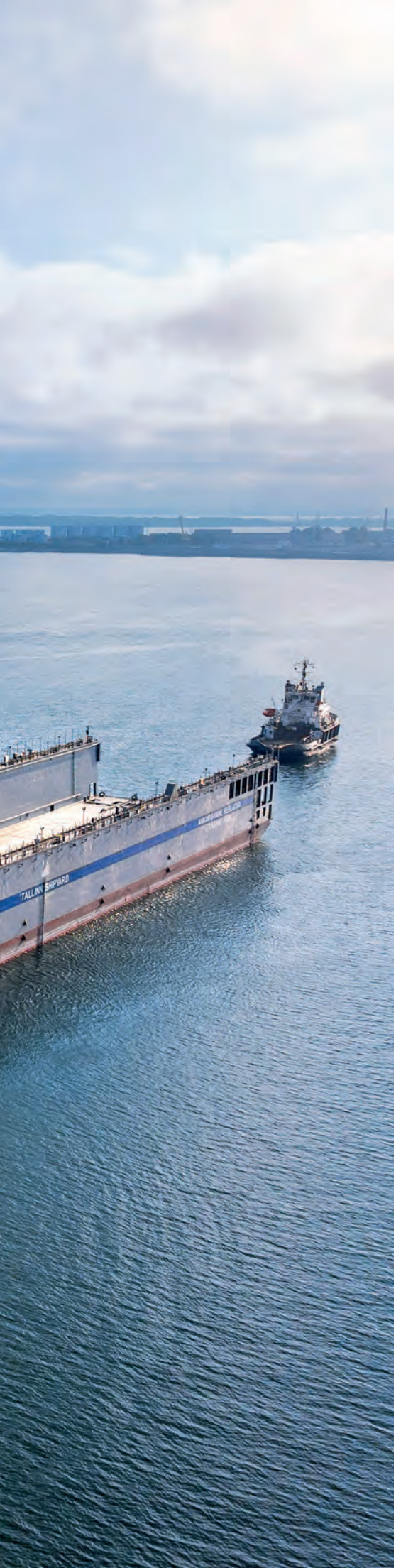
NEW FLOATING DOCK AT BLRT

An official ceremony held on August 8 at Tallinn Shipyard, a ship repair facility operated by BLRT Grupp, marked the commissioning of a new floating dock designed for vessel maintenance, repair and upgrade services.



BLRT Grupp, one of the largest industrial holdings in the Baltic region, operates Tallinn Shipyard in Estonia, Western Shiprepair in Lithuania and Turku Repair Yard in Finland, providing comprehensive 24/7 vessel repair and upgrade services. These three yards repair, upgrade and service around 300 vessels annually.

The 180m-long and 30m-wide floating dock, with a lifting capacity of 10,000 tonnes, was completed at the Hat-San Shipyard in Turkey at the end of May 2024. Once all the necessary infrastructure for the dock installation was complete, the dock itself was transported to Tallinn by the *Zeus of Finland* tug, owned by Alfons Håkans, and positioned in its designated location, previously occupied by the old 15m-long, 27m-wide dock.

"The construction of the new dock for Tallinn Shipyard is the next stage in the group's ship repair investment programme, through which we have invested €90m over the past five years," stated Fjodor Berman, Chairman of the BLRT Grupp Management Board. "This step propels the holding to a new level, offering shipowners new opportunities to maintain, repair, and upgrade larger vessels, including Handysize, vessels in Tallinn. This will considerably enhance the competitiveness of both Tallinn Shipyard and the entire ship repair division of BLRT Grupp."

"We tend to think of the maritime industry mainly in terms of ships and ports, but this sector has tremendous potential," commented Kristen Michal, Prime Minister of Estonia. "The commissioning of the new large floating dock at BLRT Grupp's ship repair yard marks a significant milestone for Estonia's industrial progress. This investment will substantially expand the yard's capabilities to service, repair, and upgrade large-capacity vessels. Simultaneously, it will support Estonia's strategy for developing a hub of environmentally safe and innovative maritime technologies and services. If we approach this wisely, we can transform Estonia into a nation as advanced in maritime technologies as we are today in digital technologies. Such investments make an essential contribution to the implementation of this ambitious plan."

"We were excited to transport the new floating dock for BLRT Grupp," says Deniss Lazarevs, a Management Board member of Alfons Håkans, the Finnish company providing towage services. "The challenging tow from Turkey to Estonia covered a distance of nearly 7,000km. Despite the tough economic conditions, we are pleased that BLRT Grupp continues to invest in equipment and expand its operations. We at Alfons Håkans hope that the new BLRT Grupp's dock will operate smoothly and successfully for a long time." ■

NEWS

NEW TRAINING PARTNERSHIP

The Maritime Training Academy (MTA) has announced its partnership with Pacific International Lines (PIL) in the launch of the new PIL Academy, a premier centre of excellence for learning and development. This initiative is designed to provide comprehensive training in maritime and transport logistics for all PIL employees, marking a significant step towards enhancing workforce capabilities and future-proofing careers within the industry.

The PIL Academy aims to elevate the skills and knowledge of its workforce by offering a curriculum developed in collaboration with various organisations and technology partners. The curriculum will feature accredited courses that not only benefit PIL but also contribute to the broader maritime and logistics sector.

As part of this strategic initiative, PIL has partnered with the Maritime Training Academy to deliver theoretical maritime training. This includes access to MTA's globally-recognised diplomas, ensuring that PIL employees receive top-tier education and training in maritime studies.

"We are hugely excited about this opportunity and privileged to be a part of it," said Andrew Deere, Managing Director of the Maritime Training Academy. "Our collaboration with PIL represents a significant milestone in our mission to advance maritime education and training standards globally."

Representatives from the MTA were present virtually for the launch of the PIL Academy and the signing of the Memorandums of Understanding between PIL and its partners. This event marks the beginning of a promising collaboration aimed at setting new benchmarks in the maritime training landscape.

Representatives from the Maritime Training Academy were present virtually for the launch of the PIL Academy and the signing of the Memorandums of Understanding (MoUs) between PIL and its partners

For more information about the Maritime Training Academy and its distance-learning diplomas, please visit www.maritimetrainingacademy.com.

ECHANDIA BEGINS PRODUCTION IN THE US

In response to the rapidly increasing demand in America's maritime electrification sector, Sweden's Echandia has chosen to set up a production facility in Washington State, where it will begin producing its advanced maritime battery system. The US government, shipowners, and operators are increasingly recognising the financial and environmental benefits of reducing or eliminating dependence on fossil fuels.

COMING UP

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DRYDOCK MAGAZINE

Gibdock has been supporting the Royal Navy (Top) with several high-profile vessel visits in recent months, while its ferry business continues to remain strong (Bottom)

"We are pleased to announce that we will establish a production facility in the State of Washington. The US market holds immense strategic importance for us, and this represents a pivotal step in our rapid expansion," says Fredrik Hellström, CEO of Echandia Marine AB. "We extend our sincere gratitude to the Washington State Governor's office and Washington Department of Commerce for their invaluable assistance and guidance. We look forward to being part of the thriving Washington business community for many years to come."

"Washington is leading the world's high-tech revolution, putting people to work on solutions that will change the world for the better," says Washington governor Jay Inslee. "And Echandia will continue that right here in Marysville, putting brilliant Washingtonians to work and accelerating the decarbonisation of maritime transport."

Washington's favourable business environment and proximity to key customers played central roles in the decision-making process regarding the location of Echandia's new facility. The company is excited to provide new jobs in Washington and to become a more prominent player in North America's expanding maritime electrification market.

BUILDING ON GROWTH

Gibdock continues to go from strength to strength under its new ownership, building on the growth of the past two

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Berge Bulk's *Berge Neblina*

years by focusing on both new and existing clients. Notably, Gibdock has been supporting the Royal Navy with several high-profile vessel visits in recent months. The ferry business remains strong, with owners already booking vessels for next year, and the offshore construction market is also robust.

Several clients are now seeking long-term agreements or multi-vessel/volume-based discounts for docking services.

Gibdock has signed two new agency agreements: an exclusive agreement with Naval EGT for Italy, Monaco and Malta, and an agreement with BWA Yachting to expand its superyacht market. These partnerships are expected to enhance Gibdock's market reach and offerings.

Enquiries have increased compared to last year, and Gibdock anticipates a busy second half of 2024 and start of 2025, with many regular customers booking dock slots early. The company is also experiencing growth in new markets, including semi-sub-accommodation platforms, drilling rig maintenance, cruiseship drydockings and heavy fabrication projects.

FUEL-SAVING PARTNERSHIP

Damen Shipyards Group has partnered with Atal Solutions and other parties to deliver a significant boost for the maritime green transition. For BAM Shipping, the project partners will undertake the retrofit of four bulk carriers by integrating eight different proven technologies. Damen's role is to provide the vessels with fuel-saving and emission reduction technologies. Following this, the bulk carriers are anticipated to consume at least 20% less fuel and reduce up to 99% of greenhouse gases.

The increased efficiency paves the way for these and other existing vessels to sail in compliance with recent regulations such as the Energy Efficiency Existing Ship Index (EEXI) and Carbon Intensity Indicator (CII). Additionally, the reduced OPEX of the vessels is expected to yield a rapid return on investment. As a further benefit, the overhaul is anticipated to increase the vessels' lifecycle by a further 10 years.

NEW ROTOR SAILS INSTALLATION

Berge Bulk's *Berge Neblina*, a 388,000dwt Valemax ore carrier, is currently completing its voyage to Brazil following the successful installation of four 5x35m Rotor Sails from Anemoi Marine Technologies Ltd.

The installation, which took place during the vessel's scheduled drydocking, was completed at Yiu Lian Dockyards (Shekou) Ltd in China. The selected Rotor Sails have been installed on Anemoi's bespoke

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folding deployment system, whereby the sails can be folded from the vertical to mitigate impact on air draught and cargo handling operations when in port.

"Leveraging the latest in wind technology to reduce our fleet's emissions is an important part of Berge Bulk's 'Maritime Marshall Plan' for decarbonisation," explains Paolo Tonon, Berge Bulk's Technical Director. "We are optimistic that these Rotor Sails can deliver up to 8% carbon reduction."

Kim Diederichsen, CEO of Anemoi, says: "Anemoi's collaboration with Berge Bulk demonstrates how we are both working in partnership to ultimately secure shipping's zero-emission future. Anemoi remains committed to maintaining its position as a leading provider of critical vessel decarbonisation technology."

OIL TANKER REPAIR

Metalock Brasil has recently completed a complex structural repair operation on a Suezmax oil tanker following damage it incurred during a cargo transfer operation in Gabon, Africa.

The incident occurred when a strong wave caused the rupture of the cargo transfer hose, the impact of which tore a gash in the vessel's bow and damaged the bulb plating. The vessel's crew carried out an emergency temporary repair with a cement box, allowing it to sail to Salvador, Brazil, for unloading.

Metalock Brasil's team boarded the vessel in the Bay of All Saints (Bahia)


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to carry out the permanent repairs. In a challenging logistical operation, plates, equipment, and materials were transported over 1,000 miles from Santos (São Paulo) to Salvador (Bahia), and subsequently by boat to the vessel. Due to the complex surface and various curvatures of the its structure, all the skills of Metalock Brasil's technicians were put to the test.

Repairs were conducted by teams working in alternating shifts, 24 hours a day over a period of 10 days. Upon completion of the structural repairs, non-destructive tests were carried out. This was followed by inspection by the classification society and resulting in successful repair.

CARBON CAPTURE RETROFIT

Value Maritime (VM) is collaborating with ForestWave, a prominent player active in the multipurpose shortsea segment, to retrofit two 10,600dwt general cargo vessels with VM's advanced emission-reducing Filtree EGCS system and integrated carbon capture unit.

This marks the first contract between VM and ForestWave. The Filtree system with carbon capture and storage technology, capable of capturing up to 10% of CO_2 emissions, will be installed on the *FWN Sea* and *FWN Sun* at the Value Maritime quay in Rotterdam, the Netherlands. The plug-and-play Filtree unit, which includes the carbon capture feature, is based on unique and patented technology. Its compact design differentiates it from other exhaust gas cleaning systems, allowing for easy installation on this type of vessel.

ForestWave has opted for a next generation 3MW Filtree with a 10% carbon capture rate and the option to upgrade to a 30% carbon capture rate. The CO_2 will be collected in a dedicated tank onboard. The installations are scheduled for late 2024, with close collaboration between the two companies ensuring a seamless process.

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