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Ship and Offshore Repair Journal included

Ship&Offshore

THE INTERNATIONAL PUBLICATION FOR OFFSHORE & MARINE TECHNOLOGY

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Under pressure

These days, the world's busiest sea routes traverse politically sensitive regions: the South China Sea, the Strait of Hormuz, the Malacca Strait, and the Suez Canal, for example. Increasingly aggressive territorial claims, military posturing, and blockades threaten to disrupt the steady flow of goods.

Tensions between China and its neighbours over the South China Sea not only risk direct conflict but also endanger the passage of billions of dollars' worth of maritime trade daily. Similarly, instability in the Gulf region keeps energy shipments under constant threat, affecting global fuel prices and shipping costs.

The ongoing crisis in the Red Sea and the re-routing of vessels south of Africa due to Houthi attacks, has led to a staggering 45% increase in CO_2 emissions from container shipping in the European Union in 2024, according to mandatory EU emissions data under the EU Monitoring, Reporting, and Verification (MRV) regulations. This reduces years of progress in cutting the industry's carbon footprint.

Denmark's Sea-Intelligence analysis found a stark contrast between the consistent decline in CO_2 emissions from 2018 to 2023 and the unprecedented spike in 2024. Despite an increase in cargo volumes, container vessels successfully brought down their emissions by an average of 4.4% annually from 2018 to 2023. Emissions from container shipping reached 52.7 million tonnes in 2024, compared with a hypothetical 34.7 million tonnes had the crisis not occurred.

The Houthi attacks on ships began in November 2023, just over a month after the start of the Gaza war. There are varying reports on how many ships have already been attacked. In May 2024, the International Maritime Organization (IMO) reported around 50 cases. International media are now suggesting significantly higher numbers. A tragic low point was the recent attacks on the two Greek bulk carriers, *Magic Seas* and *Eternity C*.

Adding to this are the ramifications of protectionism and sanction regimes. Western sanctions on Russia, for instance, have upended maritime logistics in Europe and Asia, forcing re-routing and causing delays. Meanwhile, trade disputes have introduced unpredictability in port operations, customs procedures, and cargo flows, complicating planning for shipping companies and their clients.

The current challenges facing global shipping highlight the sector's growing exposure to geopolitical conflict, regulatory complexity, and environmental impact. What was once a stable and largely predictable system is now increasingly marked by uncertainty and disruption.

In response, shipping companies, policymakers, and international organisations must develop more adaptive strategies – whether through diversified routes, improved risk assessments, or investment in cleaner technologies. Ensuring the resilience of global supply chains in this evolving context will require coordinated, forward-looking strategies.

Shipbuilding & Equipment

Offshore & Marine Technology

Ship Operation

Ship and Offshore Repair Journal

The August issue of Ship&Offshore provides another in-depth insight into the vibrant retrofit and repair business, focusing, among other things, on shipyards in Eastern Europe and the dry and liquid bulker market

The Ship and Offshore Repair Journal starts on page 19

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Regulars

Source: Deltamarin

Deltamarin has released details of a 3,500 TEU container feeder design that will use ammonia as fuel

Ammonia-fuelled design unveiled

Container feeder | China Merchants Group subsidiary, Deltamarin, has released details of a study into a 3,500 TEU container feeder design that will use ammonia as fuel.

Key aspects of the development work have included issues such as tank capacity and safety systems. These include physical separation requirements for ammonia spaces, safe venting arrangements, physical barriers, drainage systems, water screens, and ammonia release management systems.

Deltamarin worked with Lloyd's Register and the American Bureau of Shipping on hazard identification, hazard and operability studies, and quantitative risk assessments. The classification societies subsequently issued Approvals in Principle.

Other partners in the project include Maersk, Everllence, Eltronic FuelTech, The Decarb Hub, and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (MMMCZCS).

Deltamarin's Peter Kondratjeff, project manager and naval architect, said: "The outstanding collaboration with all project partners resulted in a ship design that provides a high level of safety that was verified through multiple and extensive risk assessments."

Anemoi opens hub in China

Rotor sails | Anemoi Marine Technologies has inaugurated a new rotor sail manufacturing facility in Jingjiang, Jiangsu Province, significantly boosting production capacity as demand for wind-assisted propulsion accelerates. Strategically located within Daming Heavy Industry's base on the Yangtze River, the site provides direct access to port infrastructure, allowing efficient barge transport and streamlined installation at nearby shipyards.

Anemoi's local presence builds on years of engagement in China, including a strategic partnership with CRRC Qishuyan Institute, a subsidiary of CRRC. Composite rotor skins are manufactured using Anemoi's patented filament winding process by long-term partner Zhongfu, while Daming Heavy Industries supports steel fabrication and precision assembly.

The FPSO *P-78* sailing to *Buzios* field in Brazil Source: Seatrium

Seatrium delivers FPSO to Petrobras

P-78 | Singapore's Seatrium Limited will soon deliver the first in a series of purpose-built floating production storage and offloading (FPSO) vessel to the Brazilian national oil company, Petrobras. The sailaway ceremony of *Petrobras 78 (P-78)* took place early in July and the vessel is now on a voyage to Brazil where it will be deployed on what is claimed to be the world's largest deepwater oilfield, *Buzios*.

P-78 will have a production capacity of 180,000 barrels of oil and 7.2 million cubic metres of gas per day.

Partnership announced

Waste heat | Dubai-based ship repair, retrofit, and green marine engineering specialist, Goltens, and Munich-based Orcan Energy AG, a developer of waste heat recovery technology, have established a partnership that will see Goltens becoming a preferred and authorized engineering and installation firm for Orcan Marine's Organic Rankine Cycle systems.

These installations convert low-temperature waste heat from ship's engines into clean electrical power with potentially significant benefits in energy efficiency, fuel savings, and carbon reduction. The class-approved Orcan systems have scope to improve ships' energy efficiency in the context of the EU Emissions Trading System, FuelEU Maritime and, from 2027, the likely entry-into-force of the IMO's mid-term measures.

"Waste heat recovery is one of the most powerful and underutilised tools for improving energy efficiency," declared Orcan Energy's CEO, Andreas Sichert. "In shipping alone, over 100 TWH_{th} (terrawat-hours thermal) of waste heat could be harnessed.

"By combining Goltens' deep engineering and retrofit presence with our proven ORC systems, we're empowering shipowners to transform this untapped energy into clean, cost-effective power. Our partnership with Goltens marks a significant step in scaling up the deployment of our ORC technology in the marine industry," he added.

BSO takes delivery of *Windea Curie*

CSOV | Bernhard Schulte Offshore (BSO) has taken delivery of the commissioning service operation vessel (CSOV) *Windea Curie* from Ulstein Verft. The vessel, yard number 320, is based on the SX222 design by Ulstein Design & Solutions AS.

The *Windea Curie* is equipped with a motion-compensated walk-to-work gangway and elevator tower, a helideck, and a 3D-compensated crane. It features Twin X-Stern technology, advanced dynamic positioning systems, and highly efficient engines with a heat recovery system. The vessel has 111 cabins for up to 132 people.

The *Windea Curie* is the fourth ultra-modern vessel in the company's offshore fleet.

The CSOV *Windea Curie* is the fourth vessel in BSO's offshore fleet of ultra-modern vessels Source: Ulstein

Source: Vard

The multi-purpose vessel *Island Wellserver* was delivered in 2008

Upgrade of *Island Wellserver* completed

LWI | Norwegian shipbuilder Vard has completed a major upgrade and maintenance programme on the *Island Wellserver*, a 116m-long multi-purpose vessel owned by Island Offshore. Delivered in 2008, the vessel is designed for light well intervention (LWI), subsea installation, crane work, and inspection, maintenance and repair services.

The yard replaced the vessel's remotely operated vehicle (ROV) system, installed new winch systems and carried out general repairs. Vard said the work was carried out in close cooperation with the vessel owner. In May 2023, Island Offshore secured two years of light well intervention work on the Norwegian Continental Shelf for the *Island Wellserver*, with options for extension. The contract covers approximately 290 operational days per year in 2024 and 2025.

The vessel is now back in service and operating under the new contract. The upgrade is expected to enhance its performance in subsea intervention tasks across the shelf.

Island Offshore has long partnered with Vard for fleet maintenance and technical support, particularly as North Sea vessels face high utilisation rates and environmental demands.

Seatrium secures another FSRU conversion

Option | A new subsidiary of Turkey-based Karpowership, Kinetics, has confirmed an option for a fourth FSRU conversion to be carried out at Seatrium in Singapore. The project is an option attached to a three-conversion FSRU contract awarded by Karpowership. The Istanbul-based company operates a portfolio of power ships and land-based power plants and the latest deal brings the total number of company contracts at Seatrium to seven.

The conversion, due to begin during the third quarter of this year, involves the conversion of an LNG carrier into an FSRU to be named *LNGT Turkiye*. The project will involve the installation of a regasification module, a spread-mooring system, and integration of other plants, including cargo handling, offloading, utility, electrical and automation systems.

Seatrium executive vice president Repairs and Upgrades, Alvin Gan, commented: "We truly appreciate the trust from Kinetics in awarding us this important seventh FSRU project. This contract is a testament to the successful strategic partnership between our companies that includes four projects delivered to date: Karmol LNGT Powership Africa, Asia, Europe, and most recently, Antarctica.

"Presently, two more FSRU conversion projects for Kinetics are in progress at our yard," Gan continued, "with deliveries scheduled later this year and in the first quarter of 2026. These projects underscore Seatrium's unwavering commitment to excellence, innovation, and customer satisfaction, further cementing our position as a pioneer and market leader in the specialised FSRU conversion sector."

Seatrium has delivered the fourth FSRU *Karmol LNGT Powership Antarctica* for Kinetics Source: Seatrium

Outfitting of cable-laying vessel begins

The hull of the *Nexans Electra* was towed from Poland to Norway for final outfitting Source: Ulstein

Nexans Electra | The hull of the cable-laying vessel, *Nexans Electra*, has arrived at Ulstein Verft in Norway following a voyage from the Crist shipyard in Poland. The outfitting and completion of the complex vessel has now begun in the yard's under-cover dock hall in preparation for delivery next year.

Work will include outfitting, electrical installations, insulation, piping, and installation of key components such as the main generator set, power system, deck machinery, winches, and topside equipment. The *Nexans Electra* is to have a split turntable on deck capable of storing and releasing up to 10,000 tonnes of cable. It will also have an under-deck turntable with cable capacity of 3,500 tonnes, and a fibre optic tank with a 450-tonne capacity. The 155m-long vessel, with a beam of 31m, is designed to ship and lay large volumes of HVDC and HVAC cable systems. The cable layer is similar to the *Nexans Aurora* which was delivered by Ulstein in 2021.

Reducing supply chain emissions

EACS | Carboninsets has launched a new system to bring together cargo owners and freight forwarders with companies involved in transport supply chains. The company describes itself as 'a matchmaker service for verified Environmental Attribute Certificates (EACs)' which aims to decarbonise freight transport and business travel across all modalities and fuel types. The EACs will cover sea, air, road, rail, and inland waterway transport. It will include all major low-carbon technologies including biodiesel, hydrotreated vegetable oil, sustainable aviation fuel, bio-LNG, electrification, hydrogen, bio-methanol, and wind propulsion.

Integrated automation system unveiled

Process Control | Finland's Valmet Oyj, a process technology specialist, has launched a new integrated automation system, Valmet DNAe, a fully web-based marine control system designed to integrate with shipboard equipment to provide owners and operators with a single platform for efficient operations. It has been designed for different user groups: crew members can manage the integrated system from the engine room to the bridge with less effort, the company claims, turning real-time and historical data into 'actionable insights'.

The company claims that the Valmet DNAe system is the first web-based automation system to receive ISASecure SSO Level 1 certification. This indicates that it has been assessed and certified to meet the strict security requirements set out in the ISA-IEC 62443 standards.

The system provides step-by-step upgrade paths for a cost-effective system evolution, the company said. The new setup shares its web-based user interface, analytics tools, and common hardware with earlier Valmet DNA systems, ensuring compatibility and an easy transition for existing customers.

John Weierud, Valmet's director, Marine Automation, Automation Systems, said: "As the maritime industry evolves and ships become increasingly connected, our customers have a growing need to manage and analyse large volumes of data, taking cybersecurity into account. Therefore, in developing this system, we have focused on usability, performance, and cyber security, while ensuring efficient, safe, and reliable operations.

"The launch of Valmet DNAe in the marine industry marks a significant milestone in our journey to providing future-proof automation solutions," he added.

Illustration of the *Explora III*, which has been launched at Fincantieri's Sestri Ponente shipyard in Genoa Source: Explora Journeys

Fleet expansion continues

Explora Journey's | The construction of MSC Group's six-ship Explora Journeys' fleet is proceeding at pace with three key events marked simultaneously at Fincantieri's Sestri Ponente shipyard in Genoa. They were the launching of the *Explora III*, the third ship in the series, the coin ceremony for the *Explora IV*, and steel-cutting for *Explora V*.

Two of the Fincantieri-built vessels are already in service, and all six will be commissioned within the next three years. The last in the series, *Explora VI*, will start operating in 2028.

The ships have a range of sustainable features including cold-ironing and LNG propulsion. They also have selective catalytic reduction units and use fuel cells to convert LNG into hydrogen. Guests at the event included a range of local and regional dignitaries and representatives of Italy's civil and military authorities.

The vessel is equipped with 192 solar panels Source: Wattlab

World's first hybrid solar-powered inland vessel launched

Blue Marlin | HGK Shipping, in partnership with Dutch solar energy innovator Wattlab, has unveiled the *Blue Marlin* – the world's first inland cargo vessel capable of hybrid propulsion using solar power. The vessel's 192 solar panels can deliver up to 35 kW, supplying energy to both onboard systems and the vessel's high-voltage electric propulsion. The *Blue Marlin* follows HGK's *MS Helios*, which previously entered the Guinness Book of Records for having the largest solar array on an inland vessel. Unlike the *Helios*, whose system powers only low-voltage hotel loads, the *Blue Marlin* integrates solar power directly into its propulsion system. "The *Blue Marlin* now goes one step further by also using solar energy for the power train," explained Tim Gödde, director Ship Management at HGK Ship Management.

HAV Design delivers new live fish carrier design

Aquaculture | HAV Design has been selected as the design provider for a new live fish carrier for Norwegian aquaculture logistics operator North Salmon Service (NSS).

The vessel, featuring a fish well capacity of 5,000m^3, is based on the newly developed HAV 595 design – a versatile platform tailored to meet a wide range of operational requirements.

The HAV 595 design supports a wide range of live fish operations, including transport and sorting. It sets new benchmarks in biosecurity, fish welfare, cost-efficiency, and environmental performance, HAV Design said in a statement.

The vessel will be constructed at Fitjar Mekaniske Verksted in Norway, with delivery scheduled for 2027.

Impression of the live fish carrier design Source: HAV Design

Vard wins two-ship CSOV deal from international client

Hybrid propulsion | Norway's Fincantieri-owned Vard has won a contract for two commissioning service operation vessels (CSOVs), with an option for a third ship, from an unnamed international client.

The CSOVs' design has been developed by Vard Design in Ålesund and has been customised to meet the client's requirements. The vessels will have accommodation for up to 120 persons in 84 cabins. Hybrid propulsion systems will give the 87m-long DP2 ships transit speeds of up to 13 knots.

The vessels, intended for wind farm operations, will be based on the Vard 4 19 design with hulls optimised for low fuel consumption and the ability to operate for periods of zero emissions. The hybrid battery propulsion system will also provide additional peak power when required. The CSOVs will be methanol-ready.

Thirty-metre long electric-controlled motion-compensated walk-to-walk gangways from Vard subsidiary Seaonics will be installed. They will include an integrated tower and elevator enabling technicians to have stepless access to offshore installations located 15-30m above sea level. The vessels will also have seventonne ECMC C25 3D-compensated cranes capable of lifting up to five tonnes at a reach of 25m.

Other features of the vessels delivered by Vard Electro include the SeaQ integrated system portfolio comprising the SeaQ Bridge with a workstation that centralises all key functions. A SeaQ Green Pilot will provide a cloud-based system for monitoring fuel consumption, energy use, and emissions, providing real-time and remote performance optimisation.

Illustration of the customised CSOV design Source: Vard

Wasaline's *Aurora Botnia* is fitted with a dual-chemistry battery setup

Source: Wasaline

Electrification advances in maritime transport

TURNING POINT Battery-electric propulsion is gaining traction beyond road transport, with ferry and container operators now investing in large-scale maritime applications. The shift marks a potential turning point, writes freelance journalist Charlie Bartlett.

In 1888, German Andreas Flocken built what is generally considered to be the first practical electric car in history, the Flocken Elektrowagen. At the time, the development of electric motor-carriages had occurred very much in parallel with what is now thought of as conventional internal combustion engine (ICE)-powered cars, with Karl Benz's Benz-Patent Motorwagen having been developed just two years earlier. But this later decoupled with Henry Ford's introduction of the Model T, a fork in the road which would lead to more than a century of ICE research and development – and neglect of the electric vehicle (EV). This could almost have changed again in 1990s: the General Motors EV1, of which just over 1,000 were made, were wildly popular with their drivers, who loved their high acceleration, and the ability to charge their vehicles overnight. But in a rare display of spite, GM recalled the vehicles and crushed them – along with the billion dollars the EV1 had cost to develop.

In 2025, Pandora's Box is well and truly opened. Cheaper to run and with fewer moving parts, Chinese-developed EVs are taking over the global south. Besieged carmakers in Europe mount a rearguard action through tariffs, with a new 17.1-38.1% tariff having entered force on July 4th, on top of the 10% tariff already paid on Chinese car imports.

The European Parliament, meanwhile, begins to consider the benefits of electrification in other areas. It is noted, for example, that electric heat pumps can operate at 400% efficiency by moving warm air indoors, rather than generating it as boilers do. Electrical induction stovetops, de rigueur among culinary influencers, can transfer 90% of their heat to a pan, while gas ranges waste around 60%.

This equation is referred to as final energy consumption. Green energy sceptics point out that replacing all of today's fossil-fired energy with wind turbines and solar

panels would be almost impossible. Interestingly, however: there is no need to do so.

Electric cars require less than a third of the final energy of a petrol or diesel. This means that although there are certainly challenges getting that energy to the motor, where it needs to be, much less of it is ultimately used for the same volume of transport work.

The share of electricity in primary energy consumption measures the extent to which housing, transport, industrial and other processes are using electricity, rather than fossil fuels. It serves as a benchmark of how well countries are utilising the energy supplies they have.

In China, the share of primary energy consumption is around 30%, handily outstripping Europe's 23%. Over the past decade, China doubled its overall energy production. This has involved building new coal plants – something detractors cite as counterpoint to renewable energy developments in the west.

But in April this year, the share of solar and wind energy reached 26% of China's grid, a 572% increase since 2015, according to data from Ember, an energy analyst. Hydropower and nuclear provide a further 19%. In Europe, renewable energy generated 24.5%.

China, then, not only wildly outstrips Europe in green energy production; but makes better use of it. If Europe is to kick the habit of relying on foreign fossil fuels, it needs to electrify more; and reduce the share of clean energy that is wasted, or 'curtailed' at times of low demand – some 12 TWh in 2023.

In 2025, the conversation has finally come around to another promising avenue of electrification, which could help Europe in its quest to make effective use of its energy: shipping.

"The second wave of electrification"

An adage, often repeated, is that a ship powered by batteries would need to tow another ship-sized battery behind it. For cruise vessels, it is certainly true; but for ferries, it is quite a different matter.

A new 1,200-lane-metre ferry, *Futura,* is undergoing sea trials in Turkey, and will soon be ready for delivery to Scandlines. Plying the short route between Puttgarden, Germany, and Rødbyhavn, Denmark, the vessel will operate using a 10-MWh battery pack, fully recharging itself within twelve minutes at either end of its journey.

"We cannot wait to put her into operation," said Michael Guldmann Petersen, chief operating officer (COO) of Scandlines. "With our first emission-free ferry, we're taking a huge step toward meeting our goal of operating with zero direct emissions on the Puttgarden-Rødby route by 2030."

Two more Scandlines vessels, *Deutschland* and *Schleswig-Holstein*, are set to be converted in August and December, adding 5 MWh of battery capacity to each. Also set to be deployed on the route between Puttgarden and Rødby, the ferries' batteries are expected to reduce fuel consumption by as much as 80% and could serve as a substantial life extension for the two 1997-built ferries.

Another ferry, Wasaline's *Aurora Botnia*, is currently being retrofitted with an AYK dual-chemistry battery system to boost capacity from 2.2 MWh to 12.6 MWh. The vessel will switch between using LNG gensets in this high-efficiency mode, and operating on 100% stored battery power. ›

Source: Wikipediacommons

China now adds one UK grid's worth of renewable energy every six months

The system consists of lithium nickel manganese cobalt oxide (NMC) batteries designed to provide large amounts of energy in short bursts – 'power' batteries – and long-life lithium iron phosphate (LFP) 'energy' batteries designed to maximise energy density for onboard storage.

"To our knowledge, it is the first time this dual-battery approach has been realised in a maritime retrofit … [and] one of the most technically ambitious hybrid conversions yet attempted on a RoPax ferry," said Joonatan Haukilehto, head of New Technologies at Foreship.

This battery surge in the ferry segment has met with such enthusiasm that container operators are once again getting involved. Andreas Forsnes Jahn, Enova maritime senior advisor at Norwegian Innovation fund Enova, claims that shipping is now entering the 'second wave' of electrification.

"If the electrification of car ferries was the first wave, we hope that this will be the start of the second electrification wave in short sea shipping," he said. "These projects each show in their own way what is possible with battery electrification in shipping."

To kick things off, Eitzen Electric is developing a pair of all-battery container vessels, each equipped with a massive 100 MWh of energy storage. The two vessels will handily out-swing the current contenders, 6.7-MWh *Yara Birkeland* and Cosco's 50-MWh *Greenwater 01*. Enova has granted USD 20.2 million to Eitzen Avanti to support the project.

In the five years since *Yara Birkeland* was delivered, battery capacity has increased by around 20%, pointing to the fact that lithium ion, and other battery chemistries, still have some way to go before they reach the maturity of ICEs.

Incat's Hull 096, with dimensions similar to those of *Yara Birkeland*, features 40 MWh of battery capacity. When delivered from Incat's Tasmania shipyard, the vessel will operate on a route crossing the Río de la Plata between Buenos Aires and Uruguay for operator Buquebus, carrying 2,100 passengers and 225 vehicles.

Mærsk weighs in

A study by the Mærsk Mc-Kinney Møller Centre for Zero Carbon Shipping (MMMCFZCS), unveiled last year, made some interesting findings. Though the weight of batteries is understood universally as a disadvantage, researchers expect that a battery system, located at the bottom of the vessel, could act as ballast: a boon for a sector which often complains about having to carry water around. Could the bonuses of electrification even extend to the payload efficiency of ships?

"We could note that, for very heavy cargo and a stratified loading scenario (i.e., heavier containers at the bottom, lighter at the top), the amount of ballast water required is reduced and, at some point, the loss of cargo intake will approach the deadweight loss in the fully loaded condition," the paper found.

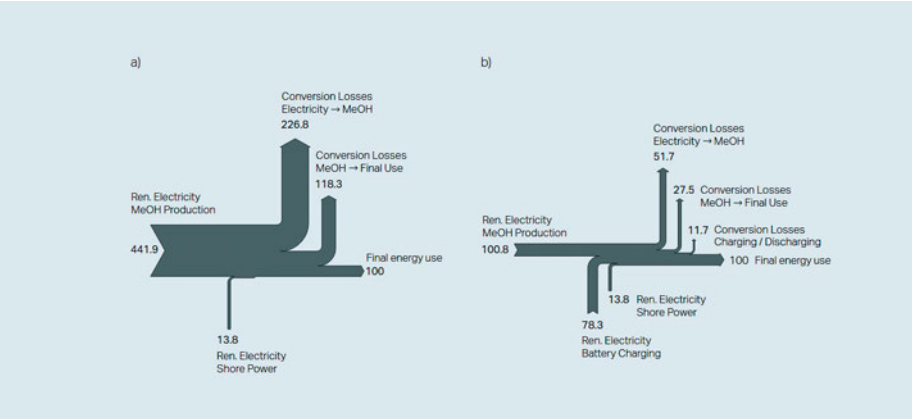
In pure economic terms, the study positions a theoretical 1,100-TEU battery-hybrid feeder vessel as on par with a methanol-fuelled ship in terms of cost. "While the energy expenditure is drastically reduced in the battery-powered vessel configuration due to the increased life-cycle energy efficiency, the capital expenditure (CapEx) increases enough to almost fully compensate for the reduced energy expenditure," the Centre calculated, using a baseline price level of USD 300 per kWh.

This is, however, an exceedingly high estimate; the reality might be somewhat more affordable. As noted in Clean Technica, record-low tender prices for Chinese utility-scale LFP battery systems plunged to USD 51 per kW in July 2025. While it is unreasonable to expect marine-hardened ship battery installations to be on par with this low cost, it does imply batteries will be available at lower than the Mærsk estimates.

But as UMAS director Tristan Smith pointed out in conversation with Ship&Offshore, cost incentives could extend even further. If battery-powered ships sail internationally, the sale of over-performance surplus units (SUs) could generate an additional revenue stream.

Battery powered ships, he added, "...should create added business case for shore power, especially where there is low carbon electricity supply. [Recent] discussions signal increased collaboration on electrification and harmonisation of UK/EU ETS, which is good news for electrifying some of the existing [UK-France] routes which are such obvious candidates."

In a world short on time, energy, and carbon budget, vessels equipped with batteries may be exactly the kind of overcorrection that is needed.



Mærsk comparison shows methanol vessel (left) and battery vessel with methanol backup (right)
Source: MMMCFZCS

A clean slate – the Eitzen Electric vessels
Source: Enova

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Supporting vessel electrification and hybrid power operations

UPSCALING Small is beautiful for fully electric vessels but the industry is also scaling up its ambitions for hybrid power, writes Gu Hai, VP, Technology (Pacific) at classification society ABS

The maritime industry is witnessing increased interest in fully electric- and hybrid-powered vessels as a means to reduce or eliminate carbon emissions. To date, most fully electric vessel projects have involved smaller ships, particularly those designed to operate within ports and harbours.

To facilitate the transition, ABS is supporting projects that seek to increase electrification in the maritime industry through the creation of common standards and the development of optimised approaches that measure the impact of electrification on assets and users.

ABS is also going further, supporting evaluations of the use of hybrid electrical systems on board much larger ships and enabling clients and shipyards to understand the implications on vessel design and operational performance.

Future ship and systems design

Singapore's Maritime and Port Authority (MPA) has signalled its intention that all harbour craft shall achieve net-zero emissions, with an ambitious timeline to develop the assets required.

Following a call for expressions of interest, MPA selected concepts to develop standardised and optimised systems. Singapore Maritime Institute has funded the Future Ship and System Design (FSSD) programme at Singapore Institute of Technology (SIT) to support further development of the chosen options. ABS is working closely with SIT in this process.

Fully aligned with industry ambitions, the project is designed to establish the platforms and standards that can enable the deployment of successive generations of net-zero harbour craft.

Key to the MPA's approach was to select the best systems approach, considering both the vessels and the design and optimisation of the supporting infrastructure. ABS will offer the class perspective to the development process, providing its unique capabilities in modelling and simulation (ModSim) to sup-

port system optimisation for both the vessel and its supporting ecosystem.

ABS can use its ModSim technology to model a single harbour craft, a fleet or a complete ecosystem. And the same technology is being increasingly employed by owners seeking solutions to bigger challenges.

While perfectly suited for small vessels, fully electric propulsion is not yet an effective option for large ones. However, the potential of hybrid electric propulsion is one of the most popular choices being explored by shipowners to increase operational efficiency and reduce carbon emissions.

This arrangement is becoming more popular for high value ships such as LNG carriers, cruiseships, container vessels, pure car and truck carriers, and offshore supply vessels. As a result, port electrification is also increasing, as the need grows for charging infrastructure to provide shore power for these larger vessels.

ModSim can be deployed to help understand the trade-offs between different power system architectures and the choice of energy efficiency technologies. The additional cost of newbuildings or conversions mean owners wish to understand fully the impact of new configurations on design and operations and what benefits can be expected.

ABS can also help owners understand the safety and reliability implications of hybrid power systems on vessel designs. Electrical installations are becoming increasingly complex as new types of power sources and loads are added to systems, in contrast to traditional installations where the load and machinery configuration are well understood. New power system architecture, such as medium-voltage direct current (MVDC) also requires new understandings on protection and safety management from the designers and the operators.

Furthermore, as software-driven energy management systems become more complex, compatibility and reliability are increasingly important issues. ABS embeds its modelling and simulation methods into its "Hardware-in-the-Loop" testbed to verify the behaviour of the software and hardware with actual operation profiles in real time. This will enhance the fidelity of the virtual validation and verification process and help ABS to develop the requirements to address the relevant industry challenges.

Model-based design evaluation

Using battery power or operating a fully or hybrid electric vessel changes the design opportunities for the owner and the user experience for the crew. To support this change, ABS develops ModSim approaches which can be used to help stakeholders develop the optimum configuration for their vessel designs.

ABS is working to establish protocols for quantifying the impact of a component (such as hybrid power and energy saving technology) on the operational performance of the entire vessel system. This Model-Based Design Evaluation (MBDE) protocol aims to provide an objective assessment of the efficacies of various new technologies.

Rather than waiting until sea trials to assess vessel performance, MBDE can be applied to evaluate the performance of a ship or system at the design stage – and take into account the ship's intended operating profile. This can provide vital insights for owners who are currently required to build ships to Energy Efficiency Design Index (EEDI) design criteria that may not reflect the energy efficiency of their operations. The lack of consideration of the operational profiles of the vessel mean that a vessel with a good EEDI rating may not necessarily have lower emissions and two vessels with similar EEDI ratings may have divergent emissions.

The ability to consider operational performance at the design stage makes it possible to construct a model that includes the operational profile and standardise predictions of vessel performance. The fact that ships may not operate on the routes or trades first envisaged can also be factored into the model. Using a library of historical data it is possible to create a matrix of operational profiles that the owner can analyse to understand how efficient – and how flexible – the chosen design is likely to be and whether it requires adjustment.

The application of hybrid power is one of the most promising areas for which to apply the MBDE framework. Whereas traditional approaches to design modifications can be assessed based on previous experience, exploring new concepts that integrate hybrid power into vessel designs requires clients to understand the implications of their choices as early in the process as possible.

The wide range of factors to consider during the modelling of a hybrid vessel with real-world operational profile leaves the possibility of divergent modelling methodologies and assumptions among the different stakeholders. This divergence would make an objective comparison of the effectiveness of the various technologies difficult, thus potentially hindering their adoption.

Strategic partnership announced on green ammonia project

EGYPT | Lloyd's Register and Germany's DAI Infrastruktur GmbH have announced a Memorandum of Understanding (MoU), outlining a new strategic collaboration on Project Ra, a large-scale green ammonia production and bunkering plant to be sited at East Port Said in Egypt. The facility is expected to have a capacity of up to two million tonnes of green ammonia per year. More than 80% of the total – 1.65 million tonnes or green ammonia – is expected to be produced solely from renewable energy sources. Production at the plant is scheduled to start in 2029.

Image of the project Ra Source: Lloyd's Register

The new partnership comes at a key moment in shipping's decarbonisation drive. Gaining access to low- or zero-carbon fuels has now become a top priority for many owners, particularly those with ships on regular trading routes. The plant will be located adjacent to the Suez Canal, a key bunkering hub for vessels trading on one of the world's busiest shipping routes.

Following the IMO's greenhouse gas reduction measures set out in its mid-term measures and likely to be adopted in October for entry into force in 2027, traditional marine fuels will become subject to a global carbon pricing system that will steadily increase the cost of fossil fuels between then and mid-century.

Panos Mitrou, LR's Global Gas Segment director, said: "Our partnership with DAI demonstrates LR's commitment to supporting the development of critical alternative fuel supply chains that will enable shipowners to navigate the post-MEPC 83 regulatory landscape successfully. By providing comprehensive advisory capabilities across market, infrastructure, and operational domains, LR is uniquely equipped to ensure this significant project delivers both commercial success and meaningful environmental impact."

DAI Infrastruktur CEO, Ioannis Papassavvas, commented: "Project Ra represents a critical step in delivering green ammonia at the scale and reliability the maritime sector urgently needs. LR's advisory support will be vital to ensure Project Ra meets the highest international standards, while aligning with the long-term needs of shipowners and global regulators.

He continued: "The Ra green ammonia project is expected to play a key role in supplying European ports – particularly in Germany and Greece – with green ammonia. This ammonia can serve multiple purposes, including use as bunkering fuel, electricity generation, and reducing CO_2 emissions in industrial processes such as steel production."

Alternative fuel orders climb sharply over first half

DIVERSIFICATION | Latest statistics on alternative-fuelled vessels from DNV reveal both a diversification of vessel types and increasing demand for larger vessels. A total of 151 alternative-fuelled vessels were ordered in the first half of this year, down on the corresponding period of 2024 when 179 orders were placed. However, measured in gross tons, there was an increase of almost 80% in the first half compared with last year, with more contracts for container ships but also bulk carriers, tankers and RoPax vessels.

DNV's Alternative Fuels Insight has revealed that the 151 vessels represented a total gross tonnage of 19.8 million gross tons. And the more diverse range of ship types, the classification society said, indicates that alternative fuels are no longer a fringe strategy, but a mainstream investment decision.

LNG was the most popular alternative fuel, with 87 ships totalling 14.2 million gross tons. Of these, 81 were container vessels. Methanol also proved popular, with orders placed for 40 vessels of 4.6 million gross tons. Ammonia and hydrogen remain on the fringe, with three and four ships ordered respectively.

DNV's Global Decarbonisation director, Jason Stefanatos, said: "The data reflects a sector that is actively recalibrating. We're not seeing a slowdown in ambition, but rather a more measured approach to investment – one that balances optionality, compliance readiness, and long-term fuel strategy. As shipowners weigh compliance strategies, the upcoming fuel intensity rules, which form part of the IMO's Net-Zero Framework, are expected to accelerate this shift. We're watching closely to see how this will be reflected in future ordering behaviour, particularly as fuel availability and infrastructure evolve, and we get further regulatory clarity when IMO's lifecycle assessment guidelines are decided."

The development of supporting infrastructure, particularly in LNG, is also accelerating. DNV recorded contracts for 13 LNG bunkering vessels in the first six months, 21% of the 62 units in operation today.

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New range of boilers launched

FUEL FLEXIBILITY | Alfa Laval Aalborg has unveiled a new fuel-flexible range of boilers that can be supplied as electric hybrids or as hybrid-ready units. Launched earlier this year, the more sustainable boiler range has already sparked significant interest as owners and operators seek to stay ahead of tightening green port directives.


Source: Alfa Laval

The electric hybrid and hybrid-ready Alfa Laval Aalborg boiler accommodates for fuel flexibility

Environmental initiatives have led to various new regulations both at sea and in port. Many ports have introduced systems enabling ships to use onshore power supplies to cut emissions while they are berthed.

FuelEU Maritime, California's At-Berth Regulation, and China's drive to introduce mandatory onshore power systems in ports are examples of new measures. Meanwhile, the IMO's North-East Atlantic Emissions Control Area is scheduled for adoption in October before entry into force in 2027.

The new Aalborg boiler platform has been developed to be as flexible as possible. The company claims that the future-proof designs provide a powerful pathway for decarbonising port operations and boosting energy efficiency. The units can be configured for operation on oil and biofuels, and one additional alternative fuel such as LNG, methanol or ammonia in the future. The hybrid-ready version is designed to operate entirely on fuel but is ready to have an electrical connection installed at a later date.

"We are constantly innovating to deliver future-proof solutions that help our customers to stay ahead in their decarbonisation journey," declared Jeppe Jacobsen, head of Global Sales at Alfa Laval. "Our first-of-its-kind hybrid and hybrid-ready boilers combine proven performance with forward-thinking design, providing the flexibility to adapt to new fuels, integrate shore power, reduce emissions, and meet evolving environmental regulations both at sea and in port.

"Shipowners are already embracing the concept," Jacobsen continued. "Since launching the hybrid-ready solution at the beginning of 2025, Alfa Laval has secured many orders. The adaptability of our boiler platform gives shipowners long-term confidence, and they appreciate the peace of mind and flexibility that comes with knowing they are prepared for stricter regulations and evolving fuel availability."

New BWTS addresses changing requirements

OPTIMARIN GUARDIAN | Norway-headquartered Optimarin has unveiled a new ballast water treatment system (BWTS), Optimarin Guardian, available in a range suitable for both large ships and smaller vessels. The new systems have been designed to meet the changing requirements for shipowners and operators as they face higher energy costs and growing geopolitical uncertainties, the company said.

The launch comes just over a year after Optimarin acquired the Hyde Marine UV business from Italy's Industrie De Nora S.p.A. The Norwegian company bought the Hyde Marine and Hyde Guardian brands.

Pilot installations of the Guardian system have shown performance gains in power consumption and operation uptime, Optimarin claims. Although optimised for large vessels with a possible treatment capacity of more than 3,000m^3 per hour, the system is also available as a small compact 60m^3/hour unit suitable for smaller vessels including fishing boats, workboats, and yachts. This arrangement broadens Optimarin's potential market.

The Norwegian company has focused attention on the resilience of its supply chain. It has adopted a regional distribution system which, it claims, minimises delivery times and supports localised service in regions including Europe, Asia, and the Middle East.


Source: Optimarin

The new Optimarin Guardian BWTS

Tonje Olafsen, vice president Sales & Projects, commented: "We've spent the last few years quietly building redundancy into our supply chain. Now that global logistics are under strain, we're able to maintain delivery reliability while competitors struggle."

Customer support and quality of service are Optimarin priorities. The company has experienced engineers in key locations and has launched tailored service agreements to minimise downtime and reduce maintenance costs. These arrangements are proving popular among owners who are seeking predictability as they face tighter margins and stricter compliance requirements.

"Guardian reflects what the market is asking for: flexibility, reliability, and predictable costs," said Olafsen. "Shipowners and yards are under pressure. With Guardian, we offer a cost-effective and compliant solution backed by the service reach and engineering depth Optimarin is known for."

JULY / AUGUST 2025

SORJ

SHIP AND OFFSHORE REPAIR JOURNAL

In cooperation with

WELCOME to the latest edition of Ship and Offshore Repair Journal which comes in the run-up to the IMO's crunch MEPC 84 meeting in October. With a focus on amendments to Marpol Annex VI, the likely adoption of the IMO's proposed mid-term measures will mean an unprecedented and extended period of vessel upgrades, demand of the installation of new energy saving devices, continuing development of new fuels, as well as machinery upgrades and engine conversions.

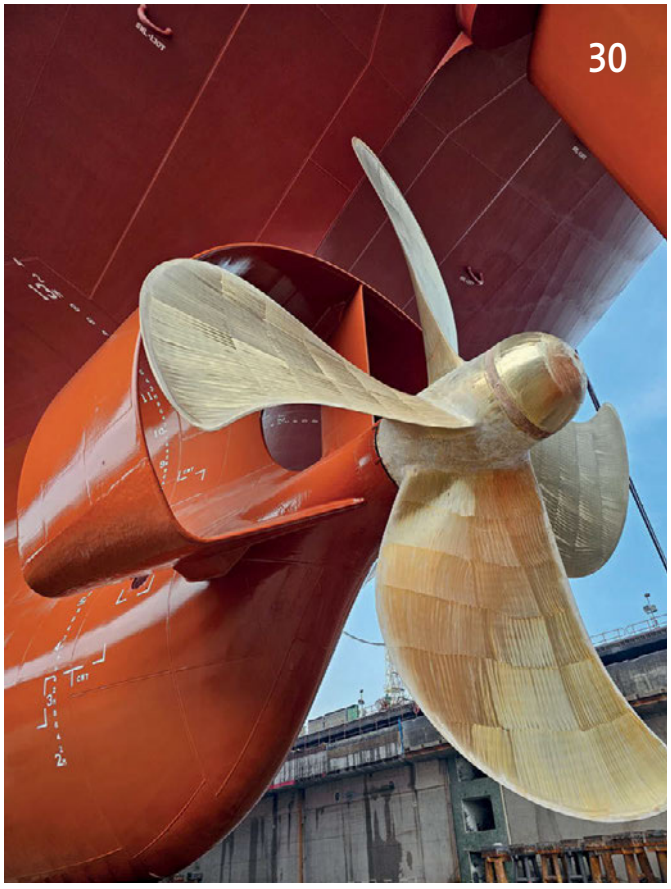
Until now, tightening regulations have applied mostly to European and Atlantic waters but the IMO's regulations, likely to become effective from 2027, will be universal. Ship operators will face steadily increasing fuel penalties if they fail to adopt and implement far-reaching decarbonisation strategies.

As a result, and in addition to routine maintenance and surveys, proactive repair yards will have lucrative new revenue streams. In this latest issue of SORJ, we examine the growing importance of underwater repairs both for initiatives relating to ship sustainability but also to save time and money by avoiding a repair berth.

We also take a look at latest developments in some Baltic and Eastern Europe repair yards. Some have successfully developed a loyal client base with regularly returning customers. Meanwhile, one of the world's largest shipping groups is negotiating the possible acquisition of a shipyard on the Black Sea.

Due to the limited availability of new fuel bunkering infrastructure, owners of dry and liquid bulk vessels in the tramp trades will find significant challenges in adopting the new marine fuels of the future. They will have to focus on the adoption of new operating systems and energy saving devices. Some forward-looking owners and their charterers, already ahead of the game, are achieving startling results.


Paul Bartlett
Managing Editor



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Afloat repairs surge in popularity

A new era of far more expensive sustainable marine fuels is one of the catalysts driving and significant increase in afloat repairs and upgrades. A new generation of floating repair technologies is focusing the minds of fleet superintendents and repair personnel. Charlie Bartlett reports.

In late 2024, a daring repair operation took place at sea. Marshall Islands-flagged geared bulk carrier *Kamari*, operated by Greece's Kamari Shipping, was set to be towed from Brazil to Spain. Its rudder, free-swinging thanks to a broken upper stock, not only yawed from side to side, but surged back and forth, hammering on the vessel's hull, causing vibrations, and endangering the tow.

Brazilian firm Seachios Marine Services and Spain's Global Underwater Services were brought in to affix the rudder, which would set it at zero-degrees throughout the tow. Equipment was limited to what could be easily transported into the field, leaving relatively few options.

After a planning phase, the team welded new pad eyes onto the rudder body and stern frame, securing it with turnbuckles and chains, preventing yawing and heaving. Welded steel bars created a rigid connection that would hold the assembly in place.

On the first day of the operation, a motor failure set back efforts to transport the necessary materials to the ship. Nevertheless, only five days later, coordinating divers and equipment with the assistance of towing company TowService BV, the operation was complete. At the time of writing, the vessel has been fixed, en route from Port Said to Algeciras.

"This operation proves that complex repairs can be successfully executed outside shipyards with proper planning and skilled personnel, offering significant time and cost benefits when risks are well-managed," said Seachios Marine Services in a statement. "It sets a precedent for future at-sea maritime operations, highlighting the industry's capacity to tackle logistical and technical challenges in demanding environments."

In-situ repair operations are becoming more common. A priority for shipowners is to reduce time in drydock and get vessels repaired or upgraded within the unavoidable downtime slot of a berthing, bunkering, loading and offloading.

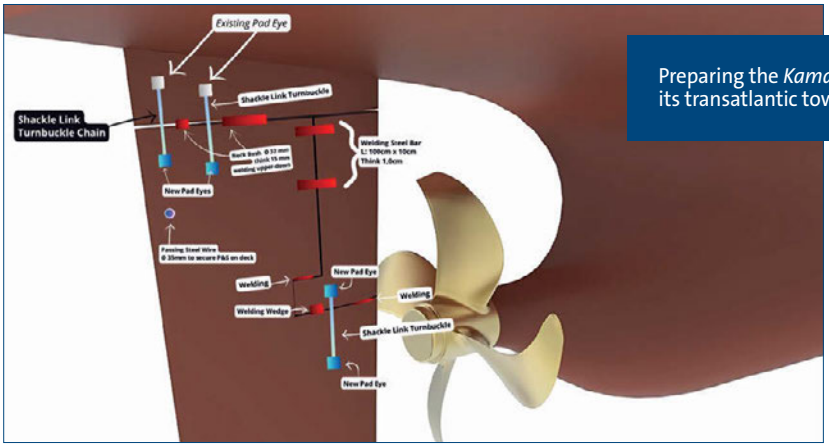
In April, Hydrex undertook a cold-straightening operation, repairing the propeller of a 180m-long bulk carrier which had been damaged in a grounding. As well as employing several divers, the work required a specialised machine designed to bend the propeller back into shape.

In Antwerp, the company took a different approach to a damaged propeller on a 252m-long container vessel. With two blades deemed to be beyond saving, Hydrex cropped the blades, matching them with two corresponding blades on the other side of the propeller, for balance.

In May, cancelling a sailing to the Bahamas, MSC Cruises joined other owners in substituting a docking of its vessel *MSC Meraviglia* in favour of afloat repairs at the Ocean Gateway Terminal in Portland, Maine. Divers replaced the propeller blades alongside, after the vessel's compromised speed had left it unable to maintain its sailing schedule.

Hyperbaric underwater facilities, affixed to the hulls of vessels, have become integral to the extra-shipyard repair equation, recreating the dry conditions necessary for in-situ sterntube maintenance, and providing comfortable pressures and dexterity for divers. Hydrex's flexible mobdock has been used on two such jobs this year; one on a container vessel in Algeciras, and another in Antwerp, on a RoRo vessel.

Wärtsilä Underwater Services extended its reach this year, forming partnerships with Sharaf Shipping Agency in Sri Lanka, and Megatugs, in Greece, giving it a presence at strategic locations along major shipping routes. Megatugs possesses considerable expertise in marine salvage as well as ▸



Preparing the *Kamari* for its transatlantic tow

Source: Seachios Marine Services

The Hydrex diver works inside the mobdock

Source: Hydrex

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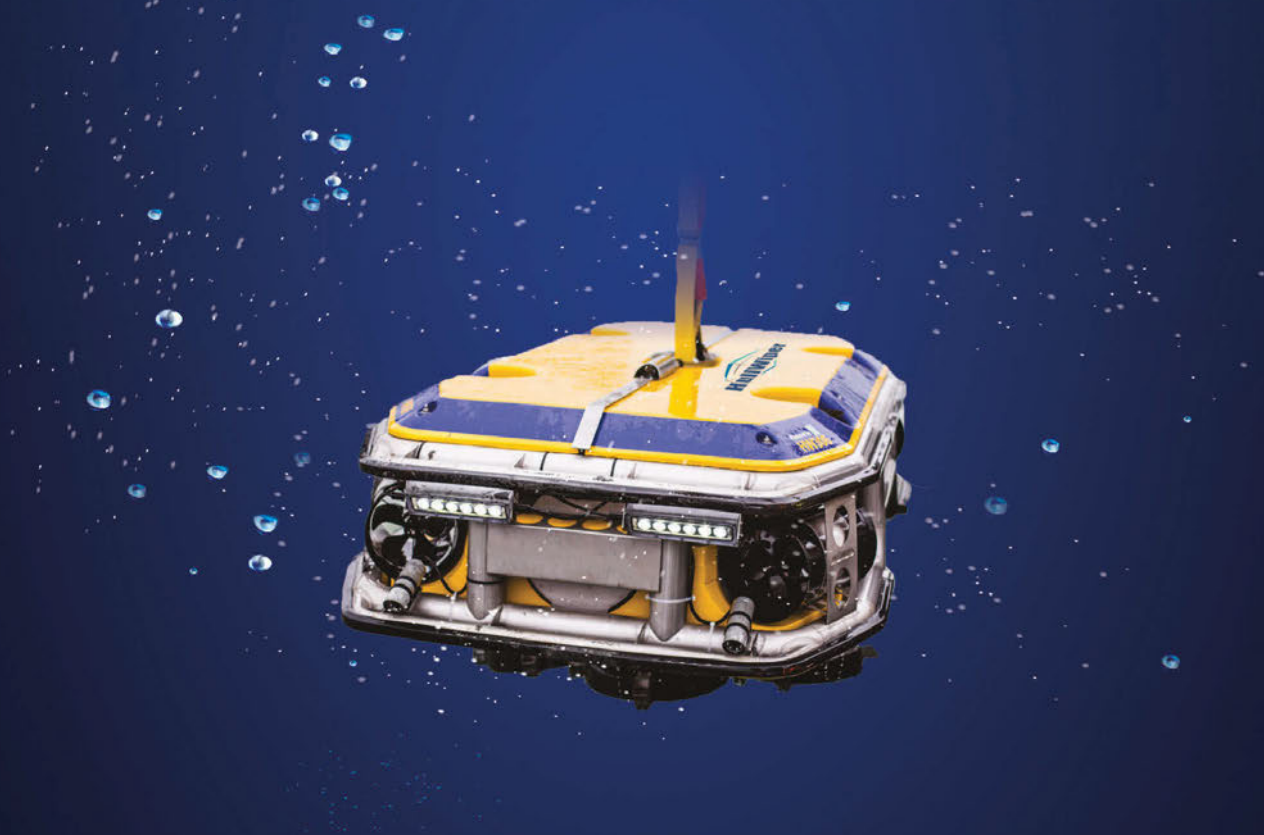

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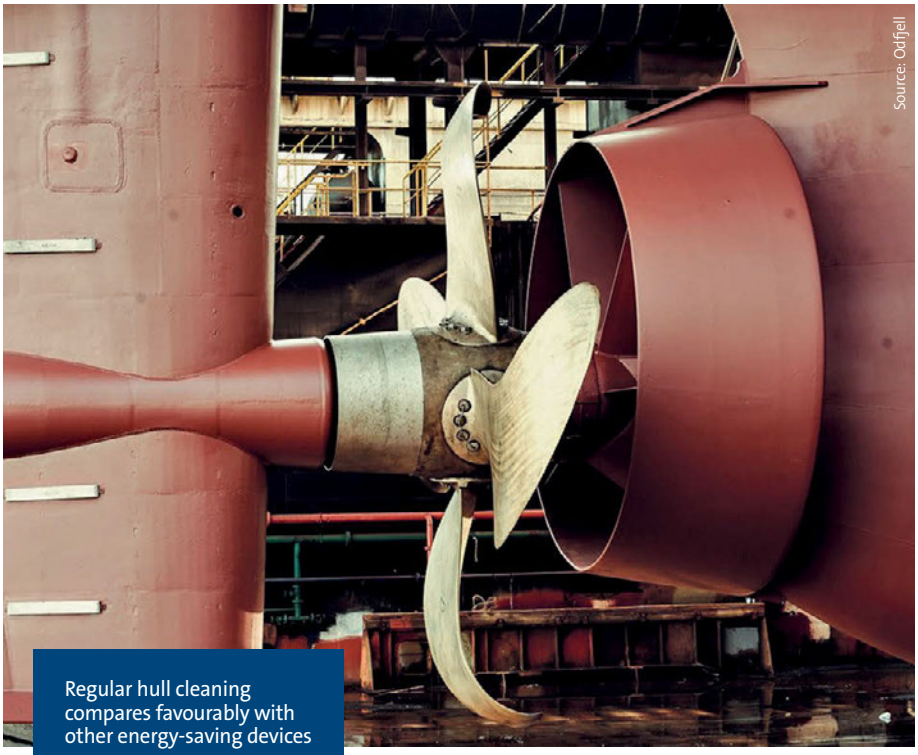
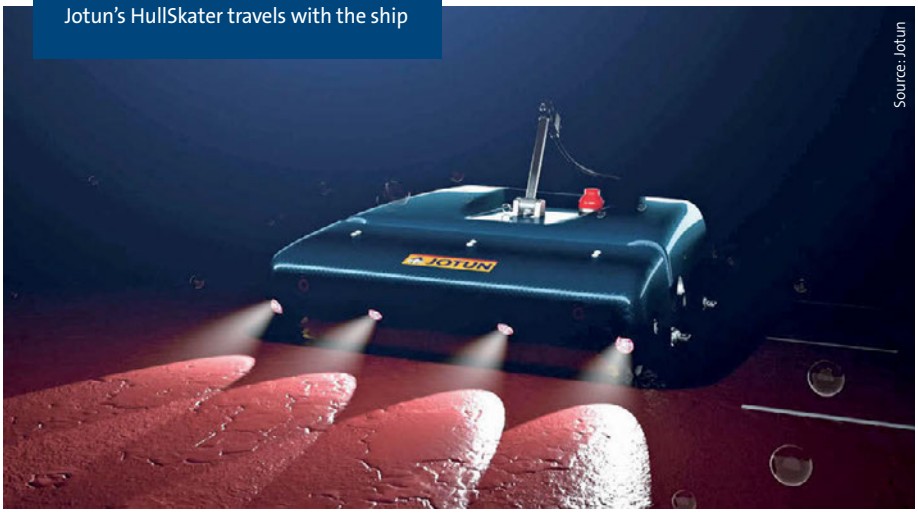

Source: Odfjell

Regular hull cleaning compares favourably with other energy-saving devices


Source: HullWiper

HullWiper now has a service hub at Damen in Dunkirk

Jotun's HullSkater travels with the ship



Source: Jotun

underwater operations, making it a good fit for tie-up with Wärtsilä, explained William Winters, Wärtsilä Underwater Services' managing director. "By joining forces with Megatugs, we're enhancing our ability to respond swiftly to emergencies and support our clients wherever they operate."

Robots take over

Meanwhile, new technologies designed to streamline the process of underwater hull cleanings have coincided with an explosion in the popularity of the practice, with shipowners having recognised the cost-saving potential of not only hull-cleaning out of drydock – but a whole lot more frequently.

A bad case of marine fouling can cause a 40% increase in fuel consumption – enough to wipe out CO_2-efficiency gains from LNG, sails, and air lubrication combined. The benefits of hull cleaning, on the other hand, compound with subsequent cleanings; early intervention prevents the buildup of marine slime which gives the bulkier organisms their handhold on the hull.

"I cannot stress enough the importance of hull cleaning," Odfjell Technology vp Erik Hjortland told Ship & Offshore Repair Journal recently, stressing that hull cleanings compared favourably with retrofits and upgrades. "It is just incredible. Regular cleaning can save 15% of fuel.

"That is the highest number we have seen in our fleet – reduction after the cleaning operation," he added – quite a claim, given Odfjell's comprehensive underwater retrofit programme which has also seen vessels equipped with Mewis Ducts, propeller boss cap fins, and air lubrication.

This year, HullWiper, which may have started the ROV cleaning craze back in 2013, signed an agreement with Damen Shiprepair Dunkerque for operations at the Port of Dunkirk. "By partnering with HullWiper, we will offer a sustainable, high-performance hull cleaning solution that meets strict environmental regulations, reduces downtime, and ensures vessels meet both local and international anti-biofouling standards," said Arnaud Chotard, managing director of Damen Shiprepair Dunkerque.

In late 2024, the Port of Singapore gave approval for underwater hull cleaning to take place alongside at quay, allowing Subsea Global Solutions to conduct Cleaning-ROV (C-ROV) operations there. As well as stripping biofouling off hulls, robots like Subsea Global Solutions' C-ROV catch the debris from the cleaning process, preventing local

waters from becoming contaminated with foreign biofouling remnants that could threaten local ecosystems.

Subsea Global Solutions' cleaning method is not limited to work alongside. Deployed from dive support vessel *Achiever*, cleanings can take place on a ship-to-ship basis anywhere where ships are waiting idle. However, it is just one of several companies vying for hull-scouring dominance within the Singapore hub.

Another, Neptune Robotics, claims that its six 'Magneto' ROVs are able to conduct underwater cleaning in currents of up to four knots, addressing one of the main selling points of the technology – that it is more reliable than divers – and a major concern – that high currents will peel the robot off the hull and sink it.

"Our technology has been ranked first among robotic hull cleaning solutions in countering strong ocean currents, providing complete hull coverage including above waterline cleaning and hull coating protection," said Elizabeth Chan, chief executive officer of Neptune Robotics. "And, we are constantly improving. Our presence in Singapore places us firmly along key international shipping routes, providing shipowners with assurance of standardised high quality vessel cleaning across the China-Singapore corridor."

ECOsubsea's Panther ROV is ten times faster than standard cleaning, the company claims, polishing off a fully-laden capesize vessel within the space of four hours. The operation, again in Singapore, was conducted in two knots of current, which would have been unworkable for a human diver team. The short cleaning interval was brief enough to be conducted within the duration of a twelve-hour bunkering operation.

Perhaps it is fear of this robotic shift which provoked some reckless cost-cutting among hull-cleaning diver teams in Singapore. In February this year, Singapore's Maritime and Port Authority (MPA) and Ministry of Manpower (MOM) took legal action against twelve commercial diving companies following two fatal accidents on anchorages at the port in 2024, including a fatal propeller entanglement.

The incidents involved the use of self-contained underwater breathing apparatus (SCUBA) diving equipment, used in the recreational diving market. According to industry regulation, cleaning and underwater repair operations should use surface-supplied diving equipment (SSDE).

A 'dolphin-skinned' propeller can yield significant fuel savings

Some SGD 13,000 (USD 10,700) was levied in fines against the involved parties. "SSDE is specifically designed for commercial diving work and includes enhanced safety features such as continuous air supply from the surface," said a Singapore Ministry of Manpower (MOM) statement. "These incidents highlight the importance of adhering to proper safety standards in commercial diving.

"MOM will continue to conduct the necessary checks and will not hesitate to take action against companies and individuals who flout the rules," the Ministry added.

With its cleaning robot, coatings giant Jotun presents a different business model – one which could disrupt the disruptors. Instead of queueing up for cleanings in Singapore, vessels can carry their own HullSkater cleaning ROV for use at any and every quayside.

During the June NorShipping show, Lloyd's Register granted type-approval to Jotun for its SeaQuantum Skate coating, designed to work in concert with the Kongsberg-developed HullSkater ROV.

Now in use on 30 vessels, the technique could represent the next phase of development for a mature coatings market where ground-breaking innovations are less and less frequent. In April, SeaQuantum Skate and HullSkater (HSS) were adopted by Thoresen Shipping Singapore, for use on bulker *Thor Brave*.

Andy Hiller, Thoresen Shipping md, called the move "... a step towards decarbonisation," which would facilitate the company "... being the best in class for cost control and in caring for our environment."

Wake wars: efficiency moves astern

According to a recent Lloyd's Register (LR) report, the popularity of aft-hull devices is growing, with some 8.4% of newbuild vessels featuring a rudder bulb, 5.6% featuring a propeller duct, and nearly 3% with stator fins. Across the existing fleet, though, there is still all to play for, with installations totalling just 1.7%, 1.5%, and 1.3%, respectively.

Pre-swirl devices such as stator fins and ducts appear less popular in the faster vessel segments, while the rudder bulb, which streamlines the flow aft of the propeller, is more popular on container ships, capturing 14.3% of the existing market and 36.6% of the newbuild orderbook. Typical payback time for a rudder bulb is 2.5 years, LR calculates, while wake equalising ducts – one of the least popular retrofits according to LR's findings – require six years.

Beyond fins, ducts and boss caps, however, is where the real madness lies. Last year, material scientists at China's Ningbo Institute of Materials Technology and Engineering (NIMTE) claimed to have applied a 'biomimetic' coating to the propeller of a Cosco Shipping Energy Transportation VLCC – one that, for a cost of $20,000, could save as much as 2% of fuel annually.

The counter-intuitive concept is said to mimic the skins of dolphins, which – despite appearances – are not smooth, but ribbed. These ridges, it is thought, might trap a layer of turbulent flow between them, thereby gluing a smooth laminar flow layer to the surface and decreasing drag on the blades, similar to the function of rotors and e-sails in wind.

Researchers also note that the leading edge of a whale's flipper is not smooth, but serrated. These lumps or bumps seem to increase the adherence of laminar water flow before 'stall' occurs – the point at which fluid flow detaches from the fin, flipper, sail, wing, or propeller blade, making it useless. This works for the same reason as a pockmarked golf ball flies further than a smooth one – or vortex generators, a recognised technology used on generations of aircraft, for the same purpose.

In February, Mitsui O.S.K. Lines announced an investment in 13 Mari, a US developer of 'flowsmart' structural elements. Harnessing the same principles of laminar and turbulent flow, it is thought that these small fairings, added to the sides of a ship's hull, could cause the laminar wake flow around the vessel to adhere tighter and detach later, creating a bracket shape around the ship instead of separating into disruptive vortices at its aft – amounting to a fuel saving of 3-7%.

Source: Remontowa

The *Stena Skane* was admitted to the yard for a comprehensive and extended intermediate survey

Buoyant repair business targets regional owners

Despite the closure of a number of Baltic repair facilities in recent years, there is still a thriving repair sector focusing on regional business in the Baltic Sea and Eastern Europe. As evidence of this, there is fresh investment and an initiative by one of the world's largest shipowning groups, aiming at vertical integration. Nick Savvides reports.

Judging a repair yard's performance can be measured by the complexity of the work it performs. However, a more telling reflection may well be the number of return contracts it gets. On that measure Poland's Remontowa is proving a major success story with international companies like Stena and Louis Dreyfus using the yard on repeated occasions for complex repairs and major conversions of their vessels.

"This RoRo vessel is a regular visitor to the Remontowa Shiprepair Yard," according to a spokesman, detailing the latest visit of the *Belgia Seaway*. Sold to Danish RoRo operator DFDS in 2021, the vessel had visited Remontowa the year before, as the *Schieborg*, to have a new car ramp fitted, when the ship was operated by Dutch company Wagenborg.

The vessel returned to the yard in 2022 to have a ballast water treatment system installed. Fast forward two years and *Belgia Seaway* has returned again, this time to overhaul its propulsion systems, including its engine room pumps, boilers, electric motors and coolers.

"Our teams dismantled the propeller shaft, hub, blades, and rudder fin. All those components underwent a thorough assessment. The rudder stock, which we identified to be reconditioned, was sent for that purpose to MarineShaft in Denmark," said the spokesman. Deck machinery and safety equipment was also inspected, cleaned and reconditioned where necessary.

Maintaining the theme of returning RoRo vessels, Stena is one of Remontowa's comeback kings with a slew of 17 returnees, including the *Skane*, a 200m-long multipurpose RoRo ship, which was admitted to the yard for a comprehensive and extended intermediate survey.

Much of the work on *Skane* focused on the propulsion and steering systems with inspections of shaftlines and stern tubes, and a rudder overhaul. More complex work involved the prefabrication of spacer rings for the pistons, produced at Remontowa, and their ▸

REMONTOWA SHIPREPAIR YARD

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installation. A positive result included a reduction in luboil consumption.

Interestingly, *Skane* has rail lines for transporting carriages. Its heavy-duty deck for these operations needed repair and the rail lines on which the railway coaches are loaded also needed replacing.

"The pipelines, including the seawater ones, as well as the ferry's overboard valves and fuel tanks, underwent extensive repairs. Our electricians checked and tuned the fan motors and auxiliary engines, and also replaced the bearings on one of the bow thruster drives," the spokesman explained.

Another familiar visitor to the Polish yard, located on Poland's Baltic Sea coast, is the cable repair and laying ship *Cable Vigilance*. Owned by Louis Dreyfus Armateurs and operating under the French flag, *Cable Vigilance* was acquired in 2021 from the Malaysian operator Optic Marine Services (OMS) Group, as a platform supply vessel.

A year later Remontowa had converted the ship into a cable layer. More recently, the yard has worked on the propulsion system, overhauling two auxiliary engines and inspecting the azimuth thruster and the retractable azimuth rudder.

According to the yard, the azimuth thruster only needed seals to be replaced. However, to overhaul the retractable thruster safely, the dock needed to be prepared in advance. Specialists cut a well in the bottom of the dock to allow sufficient space underneath the hull for the thruster to remain undamaged after drydocking.

"Once it was done and the vessel entered the dock, we lowered the thruster carefully into the prepared work area and, after dismantling the device's propeller blades, the seals were replaced," said the spokesman.

Demonstrating Remontowa's ability to meet tight deadlines even with complex repairs was its work on a trio of LPG tankers owned by StealthGas. The yard was given only a short time span for each of the three vessels to complete work.

Eco Corsair came first with a special survey, bow thruster inspection, pipe work and replacement of some steel plating. Next came *Eco Invictus*, with the main work being its second special survey.

"The biggest challenge was time," the spokesman explained. Effective planning and diligent supervision of progress was critical to meeting StealthGas' expectations, he said.

Eco Lucidity was the last StealthGas tanker to arrive at the Baltic yard and again the major challenge was completing the vessel's class renewal and installing a ballast water treatment system. Once again, a tight schedule was the main challenge.

StealthGas was reportedly pleased that the work was achieved to the required standard within the timeframe necessary. The Athens-based company first used Remontowa in 2021 when its tanker, *Gas Myth*, had a similar package of work as *Lucidity*, class survey and the fitting of a BWTS.

Repeat work for Remontowa is a clear validation of its work and an indication of a satisfied customer base.

Leo keeps on trucking

Anyone who has visited a ship repair yard will recognise the description of multi-coloured oil and other pollutants swirling around in the grey waters of the yard space, stifling life and oxygen out of the area. In these more environmentally aware times, this is clearly an unacceptable state of affairs and repair yards, like their ship recycling relatives that are now regulated by the IMO's ship recycling Convention, recognise the need to clean up their act.

Enter Leo the Truck at Estonia's BLRT repair yard in Tallinn. Leo is an autonomous surface water cleaning robot, specifically designed for industrial use in ship repair operations to clean up the mess that repair activities inevitably create.

Sergei Kravchenko, chairman of the management board at Tallinn Shipyard, told SORJ: "Leo is officially named MC4000, but more commonly known around the yard as 'Leo the Truck'. The vessel measures 2.5m by 4.1m."

According to Kravchenko, Leo runs on lithium-ion batteries and can operate from eight to 16 hours, depending on how much the skimmer is used. "Since the skimmer is only activated during serious spills, we usually recharge it once every two days," Kravchenko explained.

Built as a prototype by a collaboration of BLRT and MindChip, a spin-off of TalTech – Tallinn University of Technology in Estonia – Leo is intended to go into production once the field trials are successfully completed.

Source: BLRT Repair yards

Leo the Truck has been designed specifically for industrial use in ship repair operations to clean up the mess that repair activities inevitably create

Programmed to follow a predefined route, Leo automatically activates the pollution-cleaning system when it detects oil with its sensors.

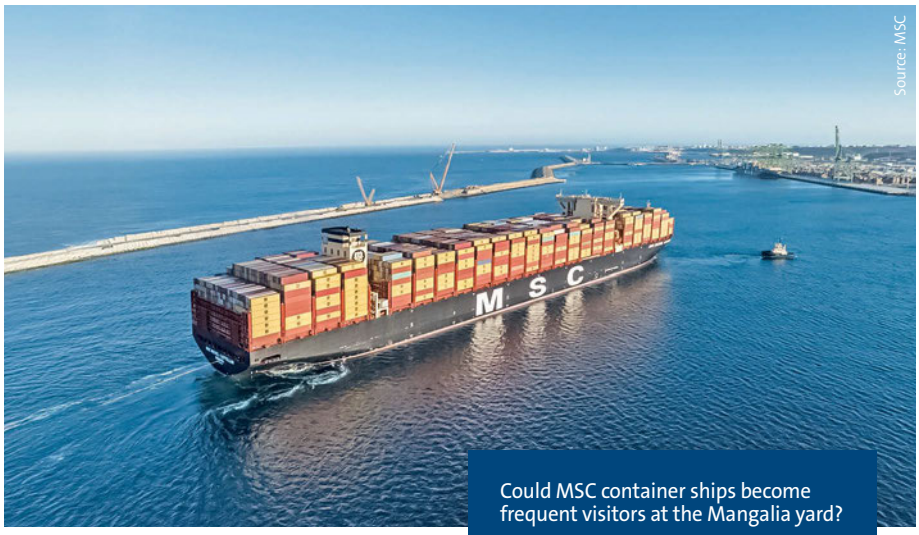
The system is primarily intended for oil spill detection and collection, but its passive SOPEP system can also absorb dust-like particles from the water surface, Kravchenko said. "The SOPEP-based system for preventive adsorption of pollutants consists of an array of super-absorbent passive units attached to the vessel, which continuously absorb possible oil and dust from the sea surface. These are single-use materials that must be replaced periodically."

Apart from being a pollution cleaner, the other reason Leo is interesting, says Kravchenko, is that it marks the initial stage of automation at BLRT Grupp's yards. Leo is part of a new generation of autonomous robots that is emerging that will develop the pollution monitoring as well as control, with a view to deploying the technology in any port, harbour or yard.

This technology, however, will not only ensure surface water cleanliness. It will also perform a wide range of autonomous operations such as environmental monitoring, data collection, and other tasks based on operational needs within the facility in which it is deployed. In such instances, automation is not simply replacing manual labour but is further developing its role.

Although, Kravchenko confirms that "automation is aimed at replacing manual operations [while also] enhancing environmental safety within the framework of a complex heavy industry," he went on to say that after Leo's field trials are completed and the robot has confirmed its operational capabilities under the Tallinn Shipyard`s [operational] conditions, "similar units may also be built for other BLRT Repair Yards in Klaipeda, Lithuania and Naantali, Finland."

However, Kravchenko emphasised that this is merely the initial stage of automation at the yards, but to find out what's coming next, he tantalises with, "More exciting updates are coming soon – stay tuned!"



Could MSC container ships become frequent visitors at the Mangalia yard?

Match made in heaven as MSC bids for Mangalia yard

Switzerland-based container and cruise ship operator Mediterranean Shipping Company (MSC) has entered into discussions with the Romanian Government in a bid to acquire a major stake in the country's troubled Mangalia ship repair yard. In a letter to the Government, MSC said that it would like to manage the yard with a view to building ships and maintaining its fleets of cruise vessels, tugs, bulkers, container ships and most recently car carriers.

The company operates 22 cruise ships and has 900 cargo vessels in its fleet, with about a quarter of its container ships acquired secondhand over the last three to four years. Many of the recently acquired vessels are over 20 years old and constitute a ready market for a repair yard.

It is a seemingly unparalleled offer since MSC's fleet is large enough to maintain work at the yard for years to come. However, the company is in competition with Turkish ship repair yard Desan to win operational control at Mangalia yard. Romanian media reported in April that Prabhat Jha, CEO of MSC Shipmanagement Limited in Limassol, Cyprus, wrote to senior Government figures at that time, including the Prime Minister, his deputy, and Romania's President in support of the bid.

"The growth of MSC's fleet requires a large shipyard for newbuilding programmes, currently concentrated in Asia (for container ships) and Europe (for cruise ships)," wrote Jha. "We intend to consider the Mangalia shipyard for future construction of cruise ships, RoPax vessels and tugboats," he added.

Emphasising MSC's ambitions, the vessel owner and its massive fleet could guarantee a large volume of work for the yard. It could well prove an incentive for the Government when it considers bids for the yard. Mangalia has been under insolvency protection since 2023 after the then operator, Dutch yard group Damen, terminated its agreement with the Romanian Government.

Damen had negotiated a partnership deal in July 2018, giving the yard operator a 49% share in the facility with the Government retaining a controlling interest in what was renamed Damen Shipyards Mangalia (DSM). However, the yard was hit hard by the pandemic and the downturn in the offshore business, which led to proposals by Damen to restructure operations and downsize the workforce, losing about 200 jobs.

The downturn also led to a new, tetchy, relationship between yard operator and Government. This, in turn, prompted the Government to pass legislation that effectively reduced Damen's involvement in the yard, prompting the Dutch company to terminate its contract with Bucharest in 2023. Repair work resumed in May this year, with around 800 employees working on two ships with a third vessel due to arrive later this year.

The 100-hectare site on Romania's coast is the largest yard on the Black Sea and in the east Mediterranean. Its facilities including three graving docks ranging from 302 by 48m to 360 by 60m, and 1,550m of quayside. These remained idle for a year after the dispute. In addition, the yard has a 1,000-tonne gantry crane, two 480-tonne cranes, and nine jib cranes of 16-20 tonnes. It also has heavy transporters capable of loading and transporting superblocks of up to 800 tonnes.

Nearby are areas for storing and cutting steel of varying thicknesses, two halls for section building, each including a panel line, and modern, covered blasting and painting facilities, complying with the latest environmental requirements. There are also dedicated workshops for mechanical works, steel outfitting and piping.

The Odfjell-owned chemical tanker, *Bow Olympus*, clocked up remarkable fuel savings on a recent transatlantic voyage

Source: Odfjell

Sustainability demands pose challenges for bulk owners

Owners of tankers and bulk carriers traditionally operate in the tramp trades. Their markets are fiercely competitive, with most charterers usually opting for the cheapest and most convenient ship. However, this is set to change in the years ahead as sustainability credentials climb corporate agendas. To make matters worse, tanker and bulker operators have fewer decarbonisation options than owners in other sectors. SORJ staff report.

Unlike container lines and ferry operators where ships run on fixed schedules between ports known in advance, tankers and bulkers deployed in global trades can be fixed anywhere for any voyage, subject only to physical constraints. In timecharters, shipowners merely accept hire for use of their ships and crews for a certain period. They have no control over vessel deployment or cargo operations, within specified limits.

Bareboat charters and, to some extent, contracts of affreightment, both used frequently in the bulk trades, also mean that owners have little control in their ships' activities. These are the tramp trades.

For owners of such vessels, the possible adoption of more sustainable fuels is likely to prove an impractical option for years to come. Alternative fuel bunkering infrastructure is not widely available and, for some fuels, may never be so. Operators may be able to add biofuel to their existing fuel mix and sidestep some future fuel penalties, but adopting entirely new fuels is simply not practical, at least for the moment.

The IMO's April MEPC meeting proved to be adversarial, but the upcoming October gathering could be even more argumentative. The meeting is likely to set the scene for shipping's decarbonisation process until 2050 and bulk vessel owners with ships in the tramp trades are directly in the firing line.

Challenges ahead

Knut Ørbeck-Nilssen, DNV Maritime boss, spoke recently about the challenges facing bulk owners in these trades. He noted that the upcoming IMO meeting in October is set to adopt the IMO's mid-term measures that were decided upon in April. Their adoption is likely to proceed and will mean new universal regulations and fuel penalties for shipping from 2027.

Speaking on a recent webinar arranged by Oslo's Rystad Energy, Ørbeck-Nilssen said that there are still major issues around the supply, infrastructure and port facilities relating to future fuels. Biofuels may well provide a relatively straightforward option for tramp owners in the short term, but supplies of these fuels may be limited and prices are likely to rise 'quite a bit', he warned.

Therefore, for such owners, Ørbeck-Nilssen said that the adoption of energy saving devices and other fuel-saving measures should be a priority. Large owners would need to have a continuous programme of upgrading existing vessels and buying new ones, he said. Smaller owners, meanwhile, might choose to be a little more ▸

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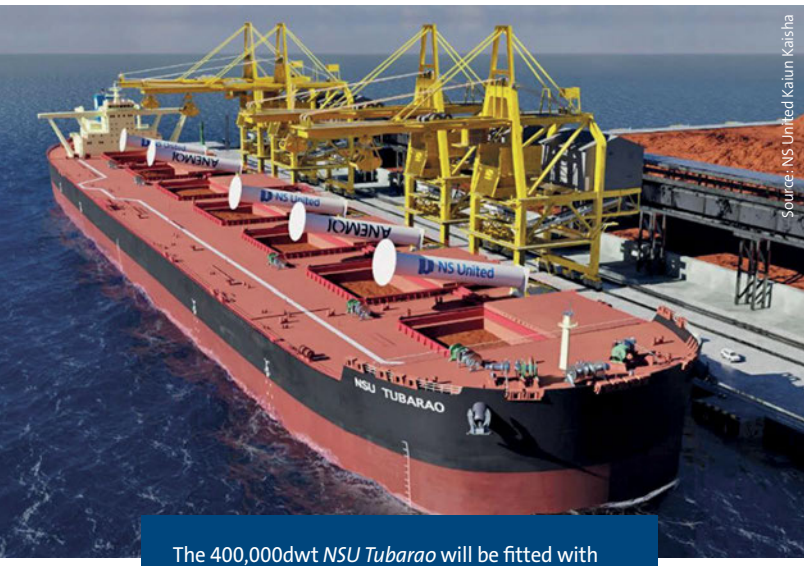
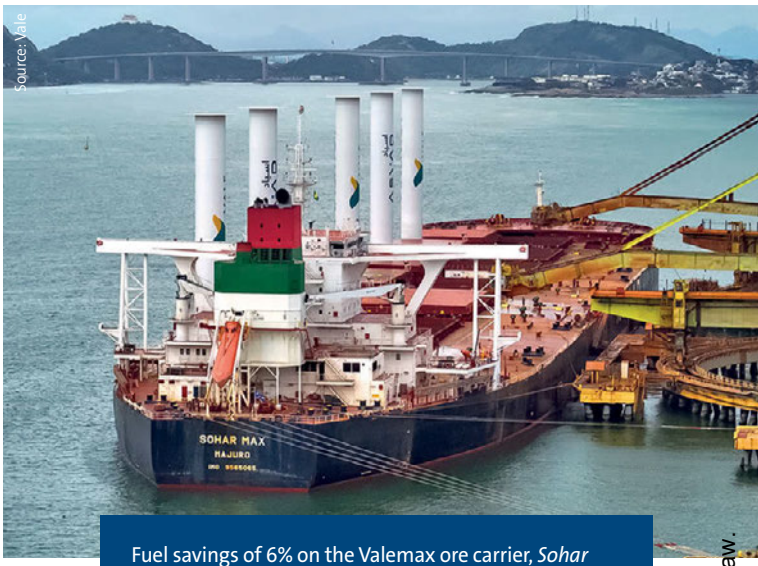


Source: NS United Kaiun Kaisha

The 400,000dwt *NSU Tubarao* will be fitted with Anemoi rotor sails and a shaft generator



Source: Vale

Fuel savings of 6% on the Valemax ore carrier, *Sohar Max*, have been recorded after rotor sails were fitted

circumspect, adopting a strong focus on energy efficiency for the moment while waiting to embark on more expensive engine conversions and dual-fuel technologies until later.

Dynamic approach

Although some owners are adopting a wait-and-see strategy, others are testing and adopting the technologies. One such company is Bergen-based Odfjell SE which, over the last ten years, has installed more than 140 energy-saving measures and devices on its vessels. Carbon intensity has been slashed by 53% compared with the IMO's 2008 baseline and the company has a target of 57% by the end of the decade.

Odfjell has released details of the impact of recently installed bound4blue suction sails on the 49,000dwt chemical tanker, *Bow Olympus*, during a transatlantic crossing. They were fitted to the vessel at EDR in Antwerp.

The winds were initially too strong on the voyage from the US. But weather conditions eased in mid-Atlantic and the sails were used for the next 2,000 nautical miles over six days.

R&D manager, Veine Huth, revealed fuel savings of more than five tonnes a day, a saving of about 16%. He explained that the crew used an AI-assisted weather routing system to make the most of the wind.

Even with light winds of up to 15% on the bow, the four sails generated forward thrust, he said, which also improved ship motions and dampened roll. And on certain legs of the voyage, fuel savings climbed to 40%.

In a separate initiative, the company used certified sustainable 100% biofuel. This, combined with the sails, would ensure the tanker's compliance with IMO's intended greenhouse gas intensity targets until at least 2044, the company claims.

Cost-benefit analysis

Meanwhile, Jack Pringle, Global Head, Energy Transition Advisory at Lloyd's Register, has emphasised the importance of thorough analysis of energy-saving initiatives. The classification society has undertaken a range of techno-economic studies for owners recently, using a 'ship as a system' approach.

He has emphasised that doing nothing is not an option because, under the likely IMO regulations, ships that continue to burn heavy fuel oil without any energy-saving measures will soon incur large financial fuel penalties. These will fall into two 'tiers': Tier 1 deficits will incur penalties of USD 100 per tonne of carbon dioxide equivalent per megajoule above a benchmark. But Tier 2 deficits, based on a more demanding carbon-cutting trajectory, are nearly four times higher, at USD 380.

Gulf yards offer enticing backdrop for upgrades

As the world's largest oil exporting region, the Middle East is a key focus for repairs and upgrades. A favourable climate and ready access to an efficient labour force from Asia form a strong foundation for efficiency and competitive pricing.

Over the years, exports from the world's largest oil producing region have fuelled demand for substantial tanker repair capacity. Facilities are constantly expanding to meet demand.

Major yards include International Maritime Industries (IMI) in Saudi Arabia (owned by Aramco, Lamprell, Bahri and Hyundai), Nakilat Keppel in Qatar, Arab Ship Repair Yard (ASRY) in Bahrain, Drydocks World Dubai, and Asyad Drydock (previously Oman Drydock).

The diversification of energy trades across the region has also spawned demand for yards focusing on smaller tankers, gas carriers and bulk carriers. These include Albwardy Damen and Arab Heavy Industries in the UAE, Heisco in Kuwait, Dammam Shipyard and Zamil in Saudi Arabia, and Milaha in Qatar.

Further expansion is under way. Construction of what is reported to be the world's largest maritime industrial zone, with an area of almost five million square metres, at Ras Al-Khair in Saudi Arabia, is a key element in the Government's economic diversification drive. The King Salman Global Maritime Industries Complex continues to expand as part of the masterplan to have a hub for shipbuilding, repair, rig fabrication, and marine engine building.

There are yet further ambitions. The Saudi Government recently revealed plans to attract some of the world's leading companies engaged in shipbuilding and related services to a new Special Economic Zone in Ras Al-Khair, boosting its footprint to 12 million square metres. Reports indicate that it will take in the existing IMI shipyard

and related service companies, but also drive continuing marine and engineering construction initiatives.

Not just tankers

Although it is primarily global energy trades that have provided the basis for shipyard expansion across the Middle East, Asyad Drydock has undertaken a range of bulk carrier repairs and environmental upgrades. Operations at Oman Drydock, renamed to the Asyad brand recently, initially began in 2011, targeting LNG carrier and VLCC repairs. But it has steadily expanded its target market to take in most vessel types, including some of the largest bulk carriers in the world.

Asyad Group, described as Oman's global integrated logistics provider, also has its own ship operating arm. Asyad Shipping started out with LNG carriers but now has a fleet comprising gas carriers, tankers, bulk carriers – including some of the world's largest – and container ships.

Last year, the company completed the installation of five Anemoi rotor sails on board the 400,000dwt ore carrier, *Sohar Max*, the largest vessel to have a wind propulsion system so far. The VLOC is a first generation Valemax, built in 2012 at China's Rongsheng shipyard. It is chartered by Rio de Janeiro-based iron ore producer, Vale, one of the world's largest miners, on a contract of affreightment.

Vale and Asyad Shipping chose the Cosco Zhoushan shipyard in China to install the five 35m-tall rotor sails, understood to have aligned most effectively with the ship's schedule. Installed last October, the sails have a bespoke folding system so that they do not hamper cargo handling operations. They were expected to cut the ship's fuel consumption by at least 6% and save 3,000 tonnes of fuel per year.

Vale is planning another Anemoi sail installation. The 400,000dwt VLOC, *NSU Tubarao*, will have a similar sail installation in September.

ASRY expands services with strong client relations

The Arab Ship Repair Yard (ASRY) was established by members of the Organisation of Arab Petroleum Exporting Countries in 1977, specifically for VLCC repairs. Over the past few decades, the company has grown steadily, broadening its services across various maritime sectors and offshore markets.

The yard offers a range of services including rig repairs, fabrication, and green ship recycling. It has formed working partnerships with companies including Abu Dhabi Ship Building and AD Ports - Noatum, generating new business and expanding its scope. The shift marks part of a new strategy adopted by ASRY this year.

Though originally focused on tanker repairs, ASRY's Director of Project Management, Abdel Maqsoon Basyouni, highlighted the company's progress over the last five decades. In an exclusive interview, he noted that while VLCCs still form a core part of the shipyard's business, ASRY now regularly services other energy-related vessels including product tankers, chemical carriers, and LPG tankers.

International clients remain at the heart of operations, alongside strong regional demand. Regular clients include ADNOC,

ASRY was set up to focus on tanker repairs but has steadily diversified into new business areas

Source: ASRY

Saudi Arabia's Bahri, Egypt's Arab Maritime Petroleum Transport Company, Springfield Shipping (the tanker management arm of the Onassis Group), India's Great Eastern Shipping, and Norway's Odfjell SE.

With energy production increasing and OPEC+ members agreeing to raise output, demand for maritime transport will increase. According to Basyouni, this has resulted in higher fleet utilisation, particularly for large tankers operating in Gulf waters. Consequently, ships are making more port calls, operating longer hours, and requiring more scheduled and unscheduled maintenance, drydockings, and regulatory upgrades.

Recent projects at ASRY have focused on supporting cleaner ship operations. Basyouni expects this trend to continue in line with the IMO's decarbonisation goals. Work has included converting vessels to run on LNG, methanol, and ammonia, installing exhaust gas cleaning systems, applying silicon-based low-friction hull coatings, and fitting air lubrication technology. Other projects involve ballast water treatment, biofouling control, and engine modifications to improve fuel efficiency.

The company has also diversified recently with the introduction of green ship recycling. The first two projects have now been completed. One involved dismantling the *Wan Hai 165* container ship in line with both the Hong Kong Convention and EU ship recycling standards.

Meanwhile in partnership with Bahrain's Ministry of Transportation and Telecommunications and the Ministry of Industry and Commerce, ASRY is developing the infrastructure needed to support ship recycling. A Memorandum of Understanding has been signed with AP Møller-Maersk to establish a recycling setup in the Kingdom. The agreement aims to promote collaboration and research in safe and sustainable recycling systems, with Maersk providing technical guidance and operational expertise to help ensure environmental standards are met. ■

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Unithai Shipyard & Engineering Ltd (Thailand)
Fujian Huadong Shipyard Ltd (China)
HuaRunDadong Dockyard Ltd HRDD (China)
CUD (Wehai) Shipyard (China)
Pax Ocean Shipyard Zhoushan (China)
Pax Ocean (Singapore)
Pax Ocean Batam (Indonesia)
First Suez Ltd - Suez Canal Transit and Shiprepair (Egypt)
Caribbean Drydock Company S.A CDC (Cuba)

JML Shipyard Agency

JML SHIPYARD AGENCY

Falkevägen 3,
457 40 Fjällbacka, Sweden
Contact: Markus Larsson, Managing Director
Mobile: +46 702 20 37 43
Email: markus@jmlshipyardagency.com
Web: www.jmlshipyardagency.com

SHIPYARDS REPRESENTED

EUROPE
Lloyd Werft, Bremerhaven, Germany
MSR Gryfia Shipyard, Szczecin, Polen
Sefine Shipyard, Tuzla, Turkey
San Giorgio del Porto, Genoa, Italy
Chantier Naval de Marseille, France
EDR Shipyard, Antwerp, Belgium
ASIA
Drydocks World, Dubai
Chengxi Shipyard, Jiangyin, China
Changhong International Shipyard, Zhoushan, China
PaxOcean , Zhoushan, China
Wenchong Shipyard Guangzhou, China
Shan Hai Guan Shipyard, China
Qingdao Beihai Shipyard, China
DSIC Marine Services, Dalian, China
PaxOcean, Singapore
PaxOcean Pertama, Indonesia
PaxOcean Nanindah, Indonesia
PaxOcean Graha, Indonesia
US, CANADA & CARIBBEAN
TNG, Veracruz, Mexico
Ciramar Shipyard, Dominican Republic
Chantier Davie, Quebec, Canada
German Ship Repair Jamaica

AFLOAT REPAIR/SERVICES

Global Offshore Service, Dubai UAE
Offshore Inland, US Gulf/Mexico
Crosscomar, Algeciras
UMA Marine, India
Link Marine / Automation, UAE
MCU Coatings
Carell, Greece

Germany

CombiTrade since 1983

COMBITRADE GMBH

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web: www.combitrade.de
Contact:
Timo Schultze (+49 172 453 9610)
Marco Löffelholz (+49 151 742 30009)

SHIPYARDS REPRESENTED

EUROPE
A&P Tyne (UK)
A&P Tees (UK)
A&P Falmouth (UK)
Aviles Shipyard (North of Spain)
Desan Shipyard (Turkey)
Eiffel Industries Marine (France Atlantic Side)
Gibdock (Gibraltar)
MTG Dolphin (Bulgaria)
Nauta Shipyard (Poland)
MIDDLE EAST
Heisco (Kuwait)
Qatar Shipyard, Qatar
AFRICA
Namdock, Walvis Bay (Namibia)
Nigerdock, Nigeria
SAS – Sandock Austral Shipyard, South Africa
SINGAPORE
ST Engineering Marine (Singapore)
INDIAN OCEAN
Colombo Dockyard (Sri Lanka)
FAR EAST
CHI Dalian (China)
CHI Nantong (China)
CHI Shanghai (Changxing + Huajing) (China)
CHI Zhoushan (China)
CHI Guangdong (China)
Fujian Huadong Shipyard, Fuzhou (China)
Beihai Shipyard, Qingdao (China)
CUD, Weihai (China)
CSSC GUANGZHOU WENCHONG, Guangzhou, China
CSSC SHANHAIGUAN SHIPBUILDING INDUSTRY CO. LTD., Qinhuangdao, Hebei, China
YIULIAN DOCKYARDS (SHEKOU) LIMITED, ShenZhen, Guangdong, China
ZTHI (China)
Nasco (China)
Huarun Dadong Dockyard (HRDD), China
DS Ship, Korea
Huangpu Wenchong (China)
Dung Quat Shipbuilding Industry Company Ltd., Quang Ngai, Vietnam
CSBC Koahsiung (Taiwan)
CSBC Keelung (Taiwan)
Mitsubishi Heavy Industries (Japan)
Orient Shipyard CO. LTD (HQ) Busan & Gwangyang Shipyard (Korea)
Sam Kang Shipbuilding & Conversion (Korea)
CENTRAL AMERICA
Caribbean Drydock (Cuba)
Ciramar, Dom. Rep.
Caribbean Dockyard (Trinidad & Tobago)
SOUTH AMERICA
SIMA, Callao (PERU)
Cotecmar, Mamonal (Colombia)
Tsakos Industrias Navales (Uruguay)

SPECIAL SERVICES:

Eras Ltd – worldwide (Thickness Measurement, Flying Squad),
(afloat voyage repair/main engine overhaul),
Marcontrel – worldwide (Port Repair, Voyage Repair and Electric Cargo Crane Automation),
Marship (afloat repair with own berth/voyage repair in European ports/yards),
STEP Consolidated – workshops in Brazil, Portugal and South Africa(Port Repair, Voyage Repair incl Flying Squads)
Seagull Marine – SE Asia (Port Repair, Voyage Repair, specialised in PBCT propeller),
Kwang-Youn-Gi Engineering Co. Ltd – Taiwan (Repair workshop with flying squad),
Pasras - Balboa (port repair, specialised in ship's automation / main engine remote & safety)
Bacviet, Haiphong (Taiwan) (port and voyage repair incl spare parts)
Shanghai Marine Technology (China) (specialized in port repair, voyage repair)
Hatchtec Marine Service, Shanghai (China) (specialized in hatch cover/deck crane/windless/winch/roro/grab)
General Shipping, Piraeus, workshop, tank treatment, blasting/painting specialist
Kamji, all China, workshop, spare parts, agent
Dimar-Tec, Singapore, fuel efficiency + monitoring systems
Cliin Robotics, Denmark
Seven Ocean, spare parts India
Dai Hwa Engineering, Korea, workshop
HMPS, Korea, retrofit, ship repair, eco-friendly conversion

GERMANIA SHIPYARD AGENCY

GERMANIA SHIPYARD AGENCY GMBH

MEMBER The International Association of Shiprepair Agents Ltd

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Web: www.shipyard-agency.com
Contacts:
Christof Gross, Eliane Tietz, Oliver Kirmse, Kai Pahnke

SHIPYARDS

NORTH AMERICA/CENTRAL AMERICA/CARIBBEAN:
• Astibal (Panama)
• Chantier Davie Canada Inc. (Canada)
• Seaspan Vancouver Drydock (Canada)
• Seaspan Victoria Shipyards Company Ltd. (Canada)
• TNG Talleres Navales del Golfo (Mexico)
SOUTH AMERICA:
• SPI Astilleros S.A. (Argentina)
FAR EAST:
• DSIC Changxingdao Shipyard Co., Ltd. (Dalian)
• Huarun Dadong Dockyard Co., Ltd. (China)
• IMC Shipyard (Zhoushan) Co., Ltd.
• PaxOcean Engineering Zhoushan Co. Ltd. (China)
• PaxOcean Shipyard Pte. Ltd. (Singapore)
• PaxOcean Asia (Pertama, Indonesia)
• CSSC Qingdao Beihai Shipbuilding Co., Ltd.
• Unithai Shipyard and Engineering Ltd (Thailand)
• Yiu Lian Dockyards Limited (Hongkong)
• Yiu Lian Dockyards (Shekou) Limited, China
• Yiu Lian Dockyards (Weihai) Limited, China
• Yiu Lian Dockyards (Zhoushan) Limited, China
PERSIAN GULF:
• Drydocks World Dubai LLC (UAE)
MED/BLACK SEA:
• Adriatic42 (Montenegro)
• Bulyard Shipbuilding Industry AD (Bulgaria)
• Carell S.A. (Greece)
• Chantier Naval de Marseille (France)
• San Giorgio del Porto Genoa (Italy)
• Sefine Shipyard (Turkey)
EUROPE ATLANTIC/BALTIC:
• Astander (Spain)
• Astican (Gran Canaria, Spain)
• Balt Yard (Gdynia)
• BREDO Dry Docks GmbH (Germany)
• Blohm+Voss B.V. & Co. KG (Germany)
• Harland&Wolff (Belfast, UK)
• Navikon SRY Ltd (Poland)
• Oresund Drydocks (Sweden)

AFLOAT COMPANIES:

• Bludworth Marine (USA)
• BMT Repairs (Spain)
• Drydocks World Global Offshore Services (UAE)
• DSK Co., Ltd (Korea)
• HON Marine (Malaysia)
• Longkong Marine Engineering Co., Ltd (China)
• Oceantrans Marine Services Co. Ltd (China)
• Offshore Inland Marine & Oilfield, LLC (USA)
• On Site Alignment (Netherlands, UK, USA, Singapore)
• MarineService Hirthals A.S. (Denmark)
• Metalock (Brasil)
• ROG Rotterdam Offshore Group (Netherlands)
• Trident B.V. (Netherlands)
• Trident (Italia)
• Trident (Malta)
• Trident (Spain)
• Trident (UAE)
• UMA Marine Group (India)

SPARES AND EQUIPMENT:

• Greentec Marine Engineering Co. Ltd
• IHB ShipDesign AD
• LAB S.A.
• OceanWings
• SunRui Marine Environment Engineering (China)
• Senda Shipping Engineering & Service Ltd (China)
• VICUS Desarrollos Tecnologicos S.L. (Spain)

Greece

T. J. GIAVRIDIS MARINE SERVICES

T J GIAVRIDIS MARINE SERVICES CO LTD

MEMBER The International Association of Shiprepair Agents Ltd

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Fax: (0030) 210-4182 432
Email: info@giavridisgroup.gr
Web: www.giavridisgroup.gr
Contact: Mr John Giavridis

Mobile: (0030) 6936 201988
Contact: Mr Nikolaos Giavridis
Mobile: (0030) 6936 766165

SHIPYARDS AND SHIP REPAIRERS REPRESENTED

AFRICA
NAMDOCK - Namibia Drydock & Ship Repair (Pty.) Ltd. - Walvis Bay (Namibia)
Dormac Marine & Offshore Engineering
AMERICAS
ASTIBAL (Panama)
Breakwater International (U.S.A.)
Detyens Shipyard (U.S.A)
GSRJ – German Shiprepair Jamaica Ltd
Offshore Inland (U.S.A.)
Proios S.A. (Argentina)
Talleres Industriales S.A. (Panama)
Tandanor Shipyard (Argentina)
Vancouver Drydock Co. - SEASPAN GROUP (Canada)
Vancouver Shipyards Co. Ltd. - SEASPAN GROUP (Canada)
Victoria Shipyards Co. Ltd. - SEASPAN GROUP (Canada)
ASIA
Chengxi Shipyard (China)
Cosco Shipping Heavy Industry Group (China)
Cosco Shipping Heavy Industry Dalian Shipyard
Cosco Shipping Heavy Industry Guangdong Shipyard
Cosco Shipping Heavy Industry Nantong Shipyard
Cosco Shipping Heavy Industry Shanghai Shipyard
Cosco Shipping Heavy Industry Zhoushan Shipyard
Cosco Shipping Maritime Technology Dalian Co Ltd (China)
Cosco Weihai Shipbuilding Marine Technology Co Ltd (China)
CSSC Shanghai Marine Diesel Engine Research Institute – SMDERI (China)
CUD Weihai Shipyard (China)
Dalian Shipbuilding Industry Company (China)
Fujian Huadong Shipyard (China)
Guangzhou Wechong Shipyard (China)
HAEIN (South Korea)
Huarun Dadong Shipyard (China)
IMC Shipyard Zhoushan (China)
Kwang Youn Gi Engineering (Taiwan)
Long Kong Marine Engineering (China)
Orient Shipyard Co. Ltd. (South Korea)
Pmax One Technologies Pte. Ltd. (Singapore)
Qatar Shipyard Technology Solutions (ex. Nakilat Keppel Offshore & Marine Shipyard – Keppel Group)(Qatar)
Qingdao Beihai Shipyard (China)
Ruitai Nantong Shipyard (China)
Sasebo Heavy Industries Co. Ltd. (Japan)
Seatrium Repairs & Upgrades Pte. Ltd (Singapore)
Seatrium Batangas Shipyard (Philippines)
Seatrium Subic Shipyard & Engineering (Philippines)
Shanhaiguan Shipyard (China)
Tru - Marine Dubai (U.A.E.)
Tru - Marine Pte. Ltd. (Singapore)
Tru - Marine Shanghai, Tianjin, Guangdong, Zhoushan (China)
Yui Lian Dockyards – Hong Kong
Yui Lian Dockyards – Weihai
Yui Lian Dockyards - Zhoushan
Yuilian Dockyards Shekou (China)
Zhoushan Changhong Shipyard (China)
Zhoushan Huafeng Shipyard (China)
Zhoushan Paxocean Shipyard (China)
Zhoushan Xinya Shipyard (China)
EUROPE
Astilleros Canarios S.A. (Astican Shipyard) (Spain)
Astilleros De Santandr S.A. (Astander Shipyard) (Spain)
Bulyard Shipyard (Bulgaria)
Desan Shipyard (Turkey)
Fincantieri Cantieri Navali Italiani S.P.A. Group (Italy)
Fincantieri Palermo Shipyard (Italy)
Fincantieri Trieste Shipyard (Italy)
Fincantieri Muggiano Shipyard (Italy)
Gemak Shipyard (Turkey)
Remontowa Ship Repair Yard (Poland)
Rotterdam Shiprepair RSR (The Netherlands)
T.K. Tuzla Shipyard (Turkey)
Tersan Shipyard (Turkey)
Tru - Marine Rotterdam (The Netherlands)
OCEANIA
Babcock Fitzroy Ltd. (New Zealand)
Varley Group (Australia)

RESOLUTE

RESOLUTE MARITIME SERVICES INC.

296, Kifisias Avenue, 152 32, Chalandri,
Athens - Greece
Tel: +30 211 182 9000 / +30 210 689 2743
Email: main@resolute.gr
Web: www.resolute.gr
Contact: Alex & Andreas Scaramangas, Nikos Pappas & Dimitris Svoronos

EXCLUSIVE REPRESENTATIONS

ASRY (Bahrain)
Lisnave (Portugal)
Dakarnave (Senegal)
Navalrocha (Portugal)
HSD Marine and Shiprepair (Singapore)
Maindeck (Technical project management software)

DEDICATED CO-OPERATIONS

Gemak Group (Turkey)
HAT SAN Shipyard (Turkey)
Odessos Shiprepair Yard (Bulgaria)
GSRJ – German Ship Repair Jamaica
Dominicana Caribbean (Dominican Republic)
Caribbean Dockyard (Trinidad and Tobago)
Gulf Marine Repair (Tampa, Florida, US Gulf)
CSSC Qingdao Beihai Shipbuilding Co., LTD. (China)
Fujian Huadong Shipyard (China)
Ruitai Nantong Shipyard Co., LTD. (China)
Zhoushan Huafeng Shipyard Co., LTD. (China)

WSR SHIP REPAIRS

WSR SERVICES LTD

77 Vasileos Pavlou, 1st Floor 16673, Voula, Greece
Tel: +3021 0428 2552
Email: mail.gr@umarwsr.com
Web: www.umarwsr.com

SHIPYARDS

ASL Marine Holdings Ltd-Batam, Indonesia
Bredo Dry Docks – Bremerhaven, Germany
Caribbean Dockyard Engineering Services Ltd (CDESL) - Trinidad & Tobago
Chengxi Shipyard Co. Ltd - Shanghai, China
Colombo Dockyard Ltd – Colombo, Sri Lanka
Detyens Shipyards - Charleston, South Carolina, USA
Dormac Marine & Engineering - Capetown/Durban, South Africa
EDR Antwerp Shipyard - Antwerp, Belgium
Fayard A/S - Munkebo, Denmark
Gemak Shipyard – Tuzla, Turkey
Guangzhou Wenchong Shipyard – Guangzhou, South China
Harland and Wolff Heavy Industries – Belfast, N. Ireland
Hengli Heavy Industry - Dalian, North China
Huarun Dadong Dockyard (HRDD) - Shanghai, China
International Ship Repair - Tampa, Florida, USA
Lloyd Werft Bremerhaven AG - Bremerhaven, Germany
MTG Dolphin - Varna, Bulgaria
Netaman Repair Group - Tallinn, Estonia
Torlak Shipyard – Tuzla, Turkey
IMC Shipyard (Zhoushan) – Zhoushan, China
Nanyang Star Group – Zhoushan, China
Port Said Shipyard - Egypt
Shanhaiguan Shipbuilding Industry Co., Ltd – Hebei, North China

UNDERWATER AND AFLOAT

Argus Marine Services - Columbia
Avalontec Engineering - Singapore
ROG Ship Repair – Rotterdam
Atlantis Marine Services LLC - Fujairah, UAE
I-Dive Services, Singapore
Underwater Contractors -Spain
Resolve Marine Services – Gibraltar
Reprosub – Las Palmas
On Site Alignment – Rotterdam, Netherlands
LongKong Marine Engineering Co., LTD – China
Voyager Marine – India & Singapore
LDM Stations in Singapore and Europe

SEADOCK

SEADOCK MARINE AGENCIES LTD

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Web: www.seadockmarine.com
Contact: George Lyras

SHIPYARDS

EDR Antwerp (Belgium)
Bulyard, Varna (Bulgaria)
CMI Yiu Lian Weihai (China)
CUD Shipyard (China)
DSIC Changxingdao (China)
DSIC Shanhaiguan (China)
Fujian Huadong Shipyard (China)
Guangzhou Wenchong (China)
HRDD Shipyard (China)
IMC YY Shipyard (China)
Longshan Shipyard (China)
Paxoean Shipyard (China)
Qingdao Beihai Shipyard (China)
Ruitai Shipyard (China)
Stonestar Shipyard (China)
Weihai Huadong (China)
Xinya Shipyard (China)
Yiu Lian Dockyards (China)
Zhoushan Huafeng Shipyard (China)
Blohm + Voss (Germany)
Emden Dockyard (Germany)
Bredo (Germany)
Lloydwerft (Germany)
Onex Shipyards (Eleusis, Syros), (Grecee)
Chalkis Shipyards (Greece)
Skaramangas Shipyard (Greece)
Yiu Lian Dockyards (Hong Kong)
ASL Shipyard (Indonesia)
Paxocean Shipyard (Indonesia)
Hankook Made (Korea)
Qatar Shipyard Technology Solutions (Qatar)
Paxocean Shipyard (Singapore)
Astilleros Cernaval (Spain)
Astilleros Ria de Aviles, S.L. (Spain)
Metalships & Docks (Spain)
Untihai Shipyard (Thailand)
Desan Shipyard (Turkey)
Ozata Shipyard (Turkey)
Sefine (Turkey)
Seltas Shipyard (Turkey)
Tersan Shipyard (Turkey)
Gemak Shipyard (Turkey)
Harland & Wolff (UK)

MARINE & UNDERWATER SERVICES

TurboTechnik GmbH & Co. KG (Germany)
Dynamic Co. (Greece)
Subsea Services (Singapore)

Italy

BANCHERO COSTA & C.

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16121 Genoa, Italy
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Contact: Fabio Bertolini
Mobile: +39 335 8078217
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Mobile: +39 335 7366801
Contact: Giovanna Ximone
Mobile: +39 335 7366802

COMPANIES REPRESENTED

Asaba shipyard (Equatorial Guinea)
Astilleros Cernaval, Algeciras (Spain)
Astilleros Mario Lopez, Malaga (Spain)
Chengxi Shipyard (China)
CM Korea Ltd
CMR Tunisie (Tunisia)
Colombo Dockyard (Sri Lanka)
Cromwell & C. (Argentina)
Crug-Versitec (marine sealing solutions - Cyprus)
Damen Shiprepair & Conversion
• Damen Shiprepair Amsterdam (The Netherlands)
• Damen Shiprepair Oranjewerf, Amsterdam (The Netherlands)
• Damen Shiprepair Brest (France)
• Damen Shipyards Den Helder (The Netherlands)
• Damen Shiprepair Dunkerque (France)
• Damen Shiprepair Harlingen (The Netherlands)
• Damen Oskarshamnsvarvet (Sweden)
• Damen Shiprepair Van Brink Rotterdam (The Netherlands)
• Damen Shiprepair Rotterdam (The Netherlands)
• Damen Shiprepair Vlissingen (The Netherlands)
• Damen Shipyards Sharjah-Albwardy Marine Engineering (UAE)
• Damen Curacao shipyard
• Damen Mangalia (former Daewoo Mangalia)
• Damen Verolme (former Keppel Verolme)
DIANCA Astilleros (Venezuela)
EST Engineering Ship Technology (Singapore)
Gemak Shipyard (Turkey)
General Naval Control (Italy)
General Shipping S.A (Greece)
Guangzhou Dengtai Shipyard (China)
Hyundai Mipo Dockyard (South Korea)
Hyundai Vinashin Shipyard (Vietnam)
Ibercisa (Spanish winches and deck machinery producer)
Komas-Korean Maritime Repairs Service (South Korea)
Malaysia Marine & Heavy Engineering (Malaysia)
MSR Gryfia Shiprepair Yard (Poland)
Paxocean Batam
Paxocean Singapore
Pregol Shiprepair Yard - Kaliningrad (Russian Federation)
Promar Uab (propulsion and sealing services – Lituania)
Qingdao Beihai Shipyard (China)
Riga Shipyard (Latvia)
Sasebo Heavy Industries (Japan)
Shanghai Shipyard (China)
Sociber (Chile)
SYM (Barcelona, Spain - Santo Domingo, Dominican Republic)
ST Marine
Underwater Shipcare, Singapore.
Zhoushan Xinya Shipyard (China)

Italy / Monaco / Switzerland

CAMBIASO RISSO SERVICES SAM

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Contact: Mr Enrico Pittaluga
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COMPANIES REPRESENTED

Alabama Shipyard – Mobile (USA)
ASMAR, Chile
China Shipbuilding Corporation (Taiwan)
• Kaohsiung Shipyard
• Keelung Shipyard
Cosco Shipping Heavy Industry
• Cosco Dalian Shipyard

• Cosco Guangdong Shipyard
• Cosco Nantong Shipyard
• Cosco Shanghai Shipyard
• Cosco Zhoushan Shipyard
• Cosco Qidong Offshore
• Cosco Shipping Ppa, Greece
• Nacks
• Dacks
CUD Weihai (China)
Dakarnave (Senegal)
Drydock World Dubai
Elgin Brown & Hamer (South Africa)
Grand Bahama Shipyard (Bahamas)
Guangzhou Wenchong Dockyard (China)
Gulf Copper (Port Arthur / Galveston / Corpus Christi – USA)
IMC – Yy Zhoushan (Zhoushan, China),
Lisnave Estaleiros Navais SA (Portugal)
Namibia Drydock
Odessos Shiprepair Yard (Bulgaria)
ONEX Elefsis Shipyards SA, Greece
ONEX Neorion Shipyards SA, Greece
Orient Shipyard (South Korea)
PaxOcean Batam
PaxOcean Singapore
Qingdao Beihai Shipyard (China)
Remontowa Shiprepair Yard (Poland)
Renave (Brasil)
Santierul Naval Costanta (Romania)
Scamp Network Ltd (Gibraltar)
Smit International (Rotterdam)
Sefine Shipyard (Turkey)
Tersan Shipyard (Turkey)
Tsakos Indusrias Navales (Montevideo, Uruguay)
Tuzla Shipyard (Turkey)
Unithai Shipyard & Engineering (Thailand)
Western India Shipyard (India)

VICTORIA MARITIME SERVICES

MEMBER The International Association of Shiprepair Agents Ltd

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Web: www.victoriamaritime.com
Contact: Luca Spinelli-Donati,
Julia Sandmann, Carlo Spinelli-Donati,

SHIPYARDS REPRESENTED
Adria Docks of Trogir, Croatia
Asry of Bahrain
Alimia Group:
• Astander of Santander, Spain
• Astibal of Balboa, Panama
• Astican of Las Palmas de Gran Canaria, Spain
Besiktas Group:
• Art Shipyard of Tuzla, Turkey
• Besiktas Shipyard ofYalova, Turkey
• Park Shipyard of Yalova, Turkey
BLRT Group:
• Tallinn Shipyard of Tallinn, Estonia
• Turku Repair Yard of Naantali, Finland
• Western Shipyard of Klaipeda, Lithuania
Cammell Laird of Birkenhead, UK
Carell of Piraeus, Greece
Chantier Naval de Marseille, France
Dormac of Durban and Cape Town, South Africa
DS Ship / Yeosu Ocean of Ulsan, Korea
Fujian Huadong Shipyard of Fuzhou-Fujian, China
Huarun Dadong Dockyard (HRDD) of Shanghai, China
Oresund Drydocks of Landskrona, Sweden
PaxOcean Zhoushan, China
ROG of Rotterdam, Netherlands
San Giorgio del Porto of Genoa, Italy
Seatrium:
• Admiralty, Tuas, Tuas Boulevard, Benoi and Pioneer Yards of Singapore
• Tuas Boulevard Yard of Singapore
• Subic Bay of Philippines
• Estaleiro Jurong Aracruz of Aracruz, Brazil
Shanhaiguan Shipyard of Qinhuangdao, China
Talleres Navales Del Golfo of Veracruz, Mexico
Tampa Ship of Tampa, Florida
Tandanor of Buenos Aires, Argentina
Xinya Shipyard of Zhoushan, China
Yiu Lian Dockyards of Hong Kong

MARINE SERVICE COMPANIES REPRESENTED
Elettrotek Kabel of Bagnolo in Piano, Italy (special electrical cables producer)
Nextcorr of London, UK (marine growth prevention and corrosion protection systems)
PBM of Rijeka, Croatia (mechanical repairs)
Polyflake of Miami, USA (high-performance, long-term anti corrosion protection)
SES Marine Services of Singapore (voyage and afloat repairs)
Turbo-Technik Repair Yard of Wilhelmshaven, Germany (mechanical repairs)

Lithuania, Latvia, Estonia, Poland

ORCA MARINE UAB

MEMBER The International Association of Shiprepair Agents Ltd

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Email: info@orca-marine.eu
Web: www.orca-marine.eu
Contact: Viktoras Cernusevicius

SHIPYARDS
Asaba Shipyard (Malabo, Equatorial Guinea);
Asmar Shipyard (Chile);
Brodotrogir D.D. Shipyard Trogir (Croatia);
Carena (Abidjan, Ivory Coast);
Chantier Naval De Marseille (France);
Colombo Dockyards (Sri, Lanka);
Cosco Shipyards Group:
• Cosco Dalian (China);
• Cosco Nantong (China);
• Cosco Shanghai (China);
• Cosco Zhoushan (China);
• Cosco Guangdong (China);
• Cosco Lyanungang (China);
Davie (Quebec, Canada);
Detyens Shipyard (N. Charleston, Usa);
Dong Sung Engineering & Shiprepair (S.Korea);
Damen Shiprepair Group:
• Damen Shiprepair Dunkerque (France);
• Damen Shiprepair Oranjewerf Amsterdam (Netherlands);
• Damen Shiprepair Brest (France);
• Damen Shiprepair Den Helder (Netherlands);
• Damen Shiprepair & Conversion Rotterdam (Netherlands);
• Damen Shiprepair Vlissingen (Netherlands);
• Damen Shiprepair Amsterdam (Netherlands);
• Damen Shiprepair Harlingen (Netherlands);
• Damen Oskarshamnsvarvet (Sweden);
• Damen Shiprepair Van Brink Rotterdam (Netherlands);
• Damen Shiprepair Curacao (Curacao, Dutch Antilles).
Enavi Reparos Navais (Rio De Janeiro, Brazil);
Fama Group (Cyprus);
Gibdock (Gibraltar);
Harland & Wolff (Belfast, Uk);
Mmhe Shipyard (Malaysia);
Astibal (Panama);
Namdock (Walvis Bay, Namibia)
Narp Shiprepair:
• Kiran/Erkal Tuzla (Tuzla, Turkey);
• Hat-San Shipyard (Yalova, Turkey);
•Tersan Shipyard (Yalova, Turkey);
•Sefine Shipyard (Yalova, Turkey);
• Hicri Ercili Shipyard (Yalova, Turkey);
•Gisan Shipyard (Tuzla, Turkey);
Oman Drydock (Oman);
Sima (Peru);
San Giorgio Del Porto (Genova, Italy);
Tandanor (Buenos Aires, Argentina);
Tsakos Industrias Navales (Montevideo, Uruguay);
Zamakona Yards:
• Zamakona Pasaia (Spain);
• Zamakona Las Palmas (Canary Isl., Spain);

MARINE SERVICE COMPANIES
Argo Navis (Greece) - Marine Consulting & Engineering (Bwts, Soxnox);
Chinaport Cleanseas - De-Slopping, Cleaning (China);
Dgs Industrial & Naval (Brazil) - Afloat Repairs;
Mechadinamik - Mechanical Services, Turkey
One Net - Satelite Communications, Bridge Equipment Service;
One Tech - Technical Service;
Sym - Afloat Repairs & Marine Services

The Netherlands

AYS SHIPREPAIR

MEMBER The International Association of Shiprepair Agents Ltd

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Telephone: +31 85 0160 635
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Web: www.aysshiprepair.nl

SHIPYARDS
EUROPE
Bulyard (Bulgaria)
Bredo Drydocks (Germany)
Gibdock (Gibraltar)
Platinum (Turkey)
NORTH AMERICA – CARIBIC
Canada East - Davie (Quebec)
Canada West - Seaspan (Vancouver)
Seaspan (Victoria)
US EAST COAST
Detyens
German Ship Repair Jamaica Ltd
PERSIAN GULF
Qatar Shipyard Technology Solutions
AFRICA
Namibia
NAMDOCK (Walvis bay)
SOUTH AFRICA
Dormac (Capetown)
Dormac (Durban)
Dormac(Saldanha)
ASIA
Korea:Orient Shipyard (Busan)
Indonesia: ASL Marine(Batam)
AUSTRALIA
Thales (NS Wales)
CHINA
DSIC Changxingdao Shipyard (Dalian)
Yiu Lian Dockyards (Hong Kong)
Yiu Lian Dockyards(Shekou)
Yiu Lian Dockyards(Zhoushan)
CUD (Weihai)
Zhoushan Changhong International Shipyard Co., Ltd
Zhoushan Putuo Changhong Shipyard Co., Ltd
Zhoushan CIMC Changhong Shipyard Co., Ltd

SHIP REPAIR SERVICES
BMT (Spain)
Greentec Marine
Haien Enc
Rotterdam Ship Repair (Netherlands)
German Ship Repair (Germany)
Offshore Inland (US /GoM)
Bludworth Marine (Houston)
SIRCO (Panama)
Mapamar (Brasil)
Brightsun(Singapore)
Trident divers (Worldwide)

AIMSS NL

Snellenshovf 51, 4811 LN Breda, The Netherlands
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Email: sales@aimss-shiprepair.com
Web: aimss-shiprepair.com

SHIPYARDS
• APCL (UK)
• ASL (Indonesia)
• ASMAR (Chile)
• ASYAD Drydock (Oman)
• CNDM (France)
• DQS (Vietnam)
• NASCO (China)
• SGDP (Italy)
• SNC (Romania)
• TERSAN (Turkey)
• TNG (Mexico)
• UNITHAI (Thailand)
• ZTHI (China)

MARINE SERVICES
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• GENERAL SHIPPING (Greece)
Tank Coating, Docking Services & Turnkey Projects
• HAI HA M&S (Vietnam)
Afloat Repairs, Mob/ Demob, Construction, Underwater Services & Voyage Repairs
• JASON MARINE ELECTRONICS (Spain)
Supply, Repair, Maintenance & Surveys for Marine Electronics & NavCom
• MANTA MARINE TECHNOLOGIES (Norway)
Fuel Optimisation & Shore Power
• PMS (Panama)
Afloat Repairs, Voyage Repairs & Underwater Services
• SINGATAC (Singapore)
Afloat Repairs, Mob/ Demob, Construction, Underwater Services & Voyage Repairs
• WINKONG (China)
Supply of Parts & Equipment, Afloat Repairs, Voyage Repairs & Underwater Services
• ZEBEC MARINE (India)
Design, Engineering & Consulting Solutions

Norway

BSA SHIPPING AGENCIES ANS

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Web: www.bsaship.com

SHIPYARDS
Brodogradiliste d.o.o Shipyard LP (Croatia)
Falkvarv (Sweden)
Cernaval Group Algeciras (Spain)
Hidramar S.L (Canary Islands)
General Shipping S. A (Greece)
TK Tuzla Shipyard (Turkey)
Sandock Austral Shipyards (South Africa)
Qatar Shipyard Technology Solutions (Qatar)
Seagull Group (Singapore & Malaysia)
Unithai Shipyard & Engineering Ltd (Thailand)

Fujian Huadong Shipyard Ltd (China)
HuaRunDadong Dockyard Ltd HRDD (China)
CUD (Wehai) Shipyard (China)
Pax Ocean Shipyard Zhoushan (China)
Pax Ocean (Singapore)
Pax Ocean Batam (Indonesia)
First Suez Ltd - Suez Canal Transit and Shiprepair (Egypt)
Caribbean Drydock Company S.A CDC (Cuba)

JML SHIPYARD AGENCY

Falkevägen 3, 457 40 Fjällbacka, Sweden
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Mobile: +46 702 20 37 43
Email: markus@jmlshipyardagency.com
Web: www.jmlshipyardagency.com

SHIPYARDS REPRESENTED

EUROPE
Lloyd Werft, Bremerhaven, Germany
Sefine Shipyard, Tuzla, Turkey
San Giorgio del Porto, Genoa, Italy
Chantier Naval de Marseille, France
EDR Shipyard, Antwerp, Belgium
ASIA
Drydocks World, Dubai
Chengxi Shipyard, Jiangyin, China
Changhong International Shipyard, Zhoushan, China
PaxOcean , Zhoushan, China
Wenchong Shipyard Guangzhou, China
Shan Hai Guan Shipyard, China
Qingdao Beihai Shipyard, China
DSIC Marine Services, Dalian, China
PaxOcean, Singapore
PaxOcean Pertama, Indonesia
PaxOcean Nanindah, Indonesia
PaxOcean Graha, Indonesia
US, CANADA & CARIBBEAN
TNG, Veracruz, Mexico
Ciramar Shipyard, Dominican Republic
Chantier Davie, Quebec, Canada
German Ship Repair Jamaica

AFLOAT REPAIR

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UMA Marine, India
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Web: www.uqp.no
Contact: Oivind Qvale or Anders Lindheim

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AMERICAS:
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Marval (Chile)

Singapore

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Web: www.umarwsr.com

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Ciramar Shipyards - Dominican Republic
Colombo Dockyard Ltd – Colombo, Sri Lanka
CUD (Weihai) Shipyard – Shandong, North China
Detyens Shipyards - Charleston, South Carolina, USA
Dormac Marine & Engineering - Capetown/Durban, South Africa
EDR Antwerp Shipyard - Antwerp, Belgium
Fayard A/S - Munkebo, Denmark
Guangzhou Wenchong Shipyard – Guangzhou, South China
Huarun Dadong Dockyard (HRDD) - Shanghai, China
Hutchison Ports TNG (Talleres Navales del Golfo S.A.) – Veracruz, Mexico
International Ship Repair - Tampa, Florida, USA
Netaman Repair Group - Tallinn, Estonia
Onex Neorion Shipyard S.A - Syros Island Greece
IMC Shipyard (Zhoushan) – Zhoushan, China
Nanyang Star Group – Zhoushan, China
Port Said Shipyard - Egypt
Shanhaiguan Shipbuilding Industry Co., Ltd – Hebei, North China

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LDM Stations in Singapore and Europe

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Web: www.bsaship.com

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Brodogradiliste d.o.o Shipyard LP (Croatia)
Cernaval Group Algeciras (Spain)
Hidramar S.L (Canary Islands)
General Shipping S. A (Greece)
TK Tuzla Shipyard (Turkey)
Sandock Austral Shipyards (South Africa)
Qatar Shipyard Technology Solutions (Qatar)
Seagull Group (Singapore & Malaysia)
Unithai Shipyard & Engineering Ltd (Thailand)
Fujian Huadong Shipyard Ltd (China)
HuaRunDadong Dockyard Ltd HRDD (China)
CUD (Wehai) Shipyard (China)
Pax Ocean Shipyard Zhoushan (China)
Pax Ocean (Singapore)
Pax Ocean Batam (Indonesia)
First Suez Ltd - Suez Canal Transit and Shiprepair (Egypt)
Caribbean Drydock Company S.A CDC (Cuba)

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Lloyd Werft, Bremerhaven, Germany
MSR Gryfia Shipyard, Szczecin, Polen
Sefine Shipyard, Tuzla, Turkey
San Giorgio del Porto, Genoa, Italy
Chantier Naval de Marseille, France
EDR Shipyard, Antwerp, Belgium
ASIA
Drydocks World, Dubai
Chengxi Shipyard, Jiangyin, China
Changhong International Shipyard, Zhoushan, China
PaxOcean , Zhoushan, China
Wenchong Shipyard Guangzhou, China
Shan Hai Guan Shipyard, China
Qingdao Beihai Shipyard, China
DSIC Marine Services, Dalian, China
PaxOcean, Singapore
PaxOcean Pertama, Indonesia
PaxOcean Nanindah, Indonesia
PaxOcean Graha, Indonesia
US, CANADA & CARIBBEAN
TNG, Veracruz, Mexico
Ciramar Shipyard, Dominican Republic
Chantier Davie, Quebec, Canada
German Ship Repair Jamaica

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Offshore Inland, US Gulf/Mexico
Crosscomar, Algeciras
UMA Marine, India
Link Marine / Automation, UAE
MCU Coatings
Carell, Greece

Switzerland

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Fax: +44 (0) 1472 245511
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Web: www.encompassmarine.com
Contacts: David Maitland, Jon Thompson
Diving & Marine: Alan Jagger, Danielle Roberts

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Asyad (Duqm, Oman)
Asaba Shipyard (Malabo, Equitorial Guinea)
Cammell Laird Shiprepairers (Merseyside, UK)
Colombo Dockyard (Colombo, Sri Lanka)
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• CHI Nantong
• CHI Shanghai
• CHI Zhoushan
• CHI Guangdong
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Grand Bahama Shipyard (Freeport, Bahamas)
Guangzhou Wenchong Dockyard (Guangzhou, China)
Hidramar Shipyards (Canary Isles, Spain)
Malaysia Marine and Heavy Engineering (Pasir Gudang, Malaysia)
Namibia Drydock and Ship Repair (Walvis Bay, Namibia)
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• Cadiz Shipyard (Cadiz)
• Cartagena Shipyard (Cartagena)
• Ferrol-Fene Shipyard (Ferrol)
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Orient Shipyards (Busan/ Gwanyang, Korea)
Shanhaiguan Shipyard (Qinhuangdoo, China)
Zhoushan IMC-YongYue Shipyard (Zhoushan, China)
Zhoushan Xinya Shipyard (Zhoushan, China)

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Lagersmit
Link Instrumentation (UAE & Singapore)
Marine Technical Services (Poland)
Maritime Shipcleaning Rotterdam
NARP Ship Repair (Turkey)
PmaxOne Services (Singapore)
Rentong Marine (China)
Rotterdam Ship Repair
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Fax: +90 216 302 50 87
Email: turmar@turmarmarine.com
Web: www.turmarmarine.com
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AMI Heat Exchangers
Dalian Cosco Rikky Ocean Engineering
Zhejiang Energy Marine Environmental Technology
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Astican Shipyard – Canary Islands
Besiktas Shipyard – Turkey
Chantier Naval De Marseille – France
Cosco Shipyard Repair Group – China
Heisco Shipyard - Kuwait

Hyundai Mipo Dockyard Co. Ltd. – South Korea
Hyundai Vinashin Shipyard – Vietnam
MYO Shipyard – Turkey
San Giorgio Del Porto – Italy
Sefine Shipyard – Turkey
Tersan Shipyard – Turkey
Yardgem Shipyard – Turkey
Shipyards Represented (China):
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DSIC Marine Services
Shanhaiguan Shipyard
Xixiakou Shipyard
Qingdao Beihai Shipyard
COSCO Shanghai Shipyard
Huarun Dadong Dockyard
SUD Shipyard
CHI Nantong Shipyard
Nantong Ruitai Shipyard
Chengxi shipyard (Jiangyin)
Changhong International shipyard
Longshan shipyard
Zhejiang Eastern Shipyard (ZESCO)
COSCO Zhoushan Shipyard
Fujian Huadong shipyard
You Lian Dockyards Shekou,
Guangzhou Wenchong Dockyard
COSCO Guangdong Shipyard
CSSC Guangxi

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SHIPYARDS

ASL Marine Holdings Ltd-Batam, Indonesia
Caribbean Dockyard Engineering Services Ltd (CDESL) - Trinidad & Tobago
Chengxi Shipyard Co. Ltd - Shanghai, China
Ciramar Shipyards - Dominican Republic
Colombo Dockyard Ltd – Colombo, Sri Lanka
Detyens Shipyards - Charleston, South Carolina, USA
Dormac Marine & Engineering - Capetown/Durban, South Africa
EDR Antwerp Shipyard - Antwerp, Belgium
Fayard A/S - Munkebo, Denmark
Guangzhou Wenchong Shipyard – Guangzhou, South China
Huarun Dadong Dockyard (HRDD) - Shanghai, China
Hutchison Ports TNG (Talleres Navales del Golfo S.A.) – Veracruz, Mexico
International Ship Repair - Tampa, Florida, USA
Netaman Repair Group - Tallinn, Estonia
Onex Neorion Shipyard S.A - Syros Island Greece
IMC Shipyard (Zhoushan) – Zhoushan, China
Nanyang Star Group – Zhoushan, China
Shanhaiguan Shipbuilding Industry Co., Ltd – Hebei, North China

UNDERWATER AND AFLOAT

I-Dive Services, Singapore
LDM Stations in Singapore and Europe

United Kingdom

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Kingston upon Thames KT2 6PT
United Kingdom
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E sales@aimss-shiprepair.com
W aimss-shiprepair.com

SHIPYARDS

- ASL (Indonesia)
- ASMAR (Chile)
- ASTANDER (North Spain)
- ASTIBAL (Panama)
- ASTICAN (Las Palmas)
- DQS (Vietnam)
- GRYFIA (Poland)
- NASCO (China)
- REIMERSWAAL (The Netherlands)
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- TERSAN (Turkey)
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MARINE PRODUCTS & SERVICES

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- JASON MARINE ELECTRONICS (Spain)
Supply, Repair, Maintenance & Surveys for Marine Electronics & NavCom
- KET MARINE (The Netherlands)
Supply of Separators & Spare Parts, Bowl Services, Services for Obsolete Control Units
- MANTA MARINE TECHNOLOGIES (Norway)
Fuel Optimisation & Shore Power
- PMS (Panama)
Afloat Repairs, Voyage Repairs & Underwater Services
- ROG (The Netherlands)
Afloat Repairs, Mob/ Demob, Construction, Underwater Services & Voyage Repairs
- SINGATAC (Singapore)
Afloat Repairs, Mob/ Demob, Construction, Underwater Services & Voyage Repairs
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Supply of Parts & Equipment, Afloat Repairs, Voyage Repairs & Underwater Services
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Design, Engineering & Consulting Solution

CALVEY MARINE LIMITED

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Contact: Suzanne Black
Mobile: +44 (0) 7867 785957
Contact: Jessica Smart
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COMPANIES REPRESENTED

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Beihai Shipyard (Qingdao)
Beihai Lifeboats (Qingdao)
Brightsun Group (Singapore) `
Cassar Ship Repair (Malta)
Chengxi Shipyard (Jiangyin)
Chengxi Shipyard (Xinrong)
Changxing Shipyard (Shanghai)
CHI Shipyards (China)
Ciramar Shipyard (Dominican Republic)
Diesel Marine International (Worldwide)
Drydocks World Dubai (UAE)
Drydocks World Dubai Global Offshore Services (UAE)
Fujian Shipyard – Huadong
Guangzhou Wenchong Dockyard
King-Marine (Global procurement specialists based in China)
Lisnave Shipyard (Portugal)
Nauta Shiprepair (Gdynia, Poland)
North East Ship Repair, (Boston)
Offshore Inland Marine & Oilfield Services (Alabama, USA)
Pan Asia Company Ltd, South Korea
PaxOcean Graha (Indonesia)
PaxOcean Nanindah (Indonesia)
PaxOcean Offshore Zhuhai
PaxOcean Pertama (Indonesia)
PaxOcean Shipyard Zhoushan
PaxOcean Singapore
Professional Manpower Supply (Global)
Global divers, underwater maintenance and cleaning
Vancouver Shipyard - (Vancouver)
Victoria Shipyard - (Victoria)
Worldwide Underwater Services
Yiu Lian Dockyards (Hong Kong)
Yiu Lian Dockyards (Shekou)
Yiu Lian Dockyards, Zhoushan, China
Young & Cunningham Valves (North Shield)

ENCOMPASS MARINE LIMITED

MEMBER The International Association of Shiprepair Agents Ltd

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Email: services@encompassmarine.com
Web: www.encompassmarine.com
Contacts: David Maitland, Jon Thompson
Diving & Marine: Alan Jagger, Danielle Roberts

SHIPYARDS

ART (Tuzla, Turkey)
Asyad (Duqm, Oman)
Asaba Shipyard (Malabo, Equatorial Guinea)
Besiktas Shipyard (Yalova, Turkey)
BLRT Group
- Tallinn Shipyard (Tallinn, Estonia)
- Turku Repair Yard (Turku, Finland
- Western Shipyard (Klaipeda, Lithuania)

Cammell Laird Shiprepairers (Merseyside, UK)
Colombo Dockyard (Colombo, Sri Lanka)
COSCO Shipping Heavy Industry, China
- CHI Dalian
- CHI Nantong
- CHI Shanghai
- CHI Zhoushan
- CHI Guangdong

CUD (Weihai) Shipyard Co., Ltd.
Detyens Shipyard (Charleston, USA)
EDR Antwerp Shipyard (Belgium)
Guangzhou Wenchong Dockyard (Guangzhou, China)
Hidramar Shipyards (Canary Isles, Spain)
ISR Repair & Marine Service (Tampa, USA)
Malaysia Marine and Heavy Engineering (Pasir Gudang, Malaysia)
Namibia Drydock and Ship Repair (Walvis Bay, Namibia)
Orient Shipyards (Busan/ Gwanyang, Korea)
Shanhaiguan Shipyard (Qinhuangdao, China)
West Sea Viana Shipyard (Viana de Castelo, Portugal)
Zhoushan IMC-YongYue Shipyard (Zhoushan, China)
Zhoushan Xinya Shipyard (Zhoushan, China)

DIVING & MARINE SERVICE COMPANIES REPRESENTED

Atlantis Marine Services (Fujairah, UAE)
Blay Marine Tech (Spain)
Hellenika (Bulgaria)
Irwin Marine
Komas (Korea)
Keyser Technologies (Singapore)
Lagersmit
Link Instrumentation (UAE & Singapore)
Marine Technical Services (Poland)
Maritime Shipcleaning Rotterdam
Metalock Brasil (Brasil)
Metalock Engineering DE (Germany)
NARP Ship Repair (Tuzla, Turkey)
PmaxOne Services (Singapore)
Rotterdam Ship Repair
Talleras Industriales (Panama)
Techcross BWMS (Korea)
TruMaine Group (Rotterdam, Singapore, China, Dubai)
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Contact: Amanda Green (North East UK Representative)
Tel: +44 191 5160010
Jamie Skillen (Diving Services)
Tel: +44 7624 232916
Cheryl Reeday (Superintendents Course)
Email: superscourse@emcs.co.im

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Email: rbell@lrmidland.com
Contact: David Walker – Sales Manager
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Mobile: +44 (0) 7853 044 898
Email: dwalker@lrmidland.com

SHIPYARDS REPRESENTED
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• Talcahuano
• Valparaiso
ASRY (Bahrain)
Dakarnave – Dakar (Senegal)
Dormac (South Africa)
• Cape Town
• Durban
• Walvis Bay
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Research reveals risk of fatigue

The report found that some offshore wind turbine support structures may fall short of required fatigue life expectations
Source: Lloyd's Register

LIFE DESIGN | Research by classification society Lloyd's Register (LR) has revealed that some offshore wind turbine support structures may not meet fatigue life design expectations. The investigation demonstrated that reliability-based inspections can help manage component fatigue risks.

The classification society assessed a North Atlantic wind farm with 60-70 turbines and a capacity of more than 500 MW. Turbines are typically designed for a service life of 25 years and a fatigue design factor of three, resulting in a minimum required fatigue life of 75 years. However, the LR study revealed that a critical joint in the jacket foundation would reach the end of its fatigue life at 52 years of operation.

LR used an S-N model – stress versus number of cycles – to estimate when structural safety might drop below acceptable thresholds. The classification society also used fracture mechanics crack growth analysis to predict the probability of failure over time and therefore the required frequency for inspections. This analysis generates Probability of Detection curves to enable inspection schedules to be dynamically updated.

The results indicated that the first inspection should take place around year nine. After that, further inspections could be required every year to maintain acceptable safety margins.

The study revealed the limitations of current inspection methods, LR said. Visual and ultrasonic inspections were found to be less effective for fatigue-critical components. Other techniques such as Eddy Current or Alternating Current Field Measurement were found to be more reliable, thereby enabling longer inspection intervals, but only when operators were prepared to accept slightly lower safety thresholds, LR said.

LR's global head of technology – Offshore and Subsea, Kourosh Parsa, commented: "Many offshore wind assets are designed to a standard fatigue factor, but real-world conditions often expose critical vulnerabilities. Our findings show that using reliability-based methods allows operators to focus inspections where the risks are greatest. By integrating sophisticated models and real-world inspection data, we can extend asset life, reduce costs and, most importantly, maintain safety."

Source: Ørsted

Setting a suction-bucket jacket foundation at Ørsted's *Greater Changhua* wind farm

Suction pump spread systems secure jacket foundations

SEABED | Framo, an Alfa Laval company based in Norway, has supplied and operated suction pump spread systems for Ørsted's *Greater Changhua 2b* and *4* offshore wind farms in Taiwan, one of Asia' slargest offshore wind developments. Critical for securing jacket foundations to the seabed, the systems provide a fast, precise installation process, eliminating the need for conventional pile-driving.

The jacket foundations were installed with Heerema's heavy-lift vessel, *Aegir*, which placed each structure on the seabed before Framo's suction pumps secured them in place. The Framo team worked closely with geotechnical specialists from the Norwegian Geotechnical Institute (NGI) which supported the installation process.

Thor Alexander Larsen, Framo project manager, commented: "The successful installation of all 66 jackets demonstrates both the reliability of our suction technology and the strength of our collaboration with Ørsted and NGI. It's a strong example of how innovative engineering can accelerate the global transition to renewable energy".

Sited between 30 and 60 km off the coast of Changhua County, the 920-MW wind farm will supply clean energy to approximately one million Taiwanese households.

Fleet addition lands long-term contract

The jack-up vessel *Wind Keeper* will strengthen Cadeler's fleet to install and maintain large-scale projects Source: Cadeler

WIND KEEPER | Cadeler has taken delivery of its latest acquisition, the vessel *Wind Keeper*, ahead of schedule. The newest addition to the fleet has also landed its first long-term firm contract with Vestas, for a three-year period commencing early in 2026.

Wind Keeper becomes the eighth vessel in Cadeler's growing fleet, further strengthening the company's capacity to install and maintain large-scale offshore wind projects.

The firm value of the contract with Vestas is approximately EUR 210 million; if all options are exercised, the contract is expected to be worth in excess of EUR 380 million.

Wind Keeper will serve as a versatile service vessel, supporting both operations and maintenance (O&M) as well as transport and installation (T&I) tasks for Vestas across current and future offshore wind projects.

The jack-up vessel left China en route to Europe earlier in July, where, ahead of contract commencement in the first quarter of 2026, it will undergo tailored upgrades to enhance its operational capacity and align its onboard capabilities with the rest of Cadeler's fleet. The vessel will be equipped with seafastening for three sets of the Vestas V236-15.0-MW turbines and will be upgraded to support installations in the growing 15-MW segment.

USV to support maritime surveillance

KGC | Technology and marine robotics company Ocean Infinity has launched its NeedleFish uncrewed surface vessel (USV) at an event with the Kuwaiti Coast Guard (KCG).

Initiated to be a component of its new national integrated maritime surveillance system being delivered by SRT Marine Systems, the NeedleFish is custom-equipped with an array of specialist maritime surveillance sensor systems. It leverages "the company's world-leading software, advanced robotics, and marine intelligence technology to equip the Kuwaiti Coast Guard with a new class of unmanned patrol, surveillance, mapping and surveying capability for its 11,000km^2 of territorial waters, all controlled from KCG's new purpose-built onshore Command Centres and fully integrated within their new SRT C5iSR maritime surveillance system", Ocean Infinity said in a statement.

One of the KCG fleet of 14m-long dual-hull NeedleFish USVs recently completed live demonstration exercises in open water in a special demonstration for His Excellency Sheikh Fahad Yousef Saud Al-Sabah, First Deputy Prime Minister and Acting Minister of Interior and Commodore Sheikh Mubarak, overall Commander of the Kuwait Coast Guard.

Wireless communication for steel environments

CONNECTIVITY As shipping's digitalisation accelerates, the need for reliable, high-capacity wireless connectivity has never been more critical. The the ability to transmit high-volume data in real time is fundamental for enabling digital twins, IoT-based monitoring, machine learning, real-time energy tracking, advanced safety systems, and emerging computer vision applications. However, wireless communication within steel-dominated environments remains one of the most complex challenges, writes Tom Hagesæther, chief technology officer at ScanReach.

Ships and large (offshore) steel structures create highly reflective, attenuative, and unpredictable radio environments, making conventional wireless systems unreliable – or even unusable.

Scandinavian Reach Technologies AS (ScanReach), in collaboration with Norwegian Research Centre AS (Norce), is building on the proven success of its onboard wireless connectivity (OWC) mesh network to expand capacity and meet growing demands for higher data throughput in steel environments. Recent laboratory breakthroughs have demonstrated wireless data rates surpassing 2 Mb/s – a substantial improvement over conventional low-power wireless technology. Building on this, a comprehensive field trial aboard the offshore vessel *Olympic Taurus* provided valuable real-world insights into signal behaviour, structural attenuation, and network performance.

ScanReach has a decade of experience with its current mesh system, deployed across a wide variety of vessels as the industry's first wireless mesh network purpose-built for steel environments. It has proven highly effective for personnel safety applications such as persons on board (POB) tracking and distress alarms, with thousands of nodes installed worldwide.

Field test on board the *Olympic Taurus* validated lab results and proved applicability

Source for both images: ScanReach

This robust backbone continues to ensure mission-critical wireless coverage today. Now, by expanding its platform's capacity, ScanReach is ready to unlock new, data-intensive applications – including real-time monitoring, advanced digital twins, and next-generation computer vision – while reducing reliance on traditional cabling.

Why high-volume wireless is essential

The global maritime industry is undergoing a clear shift towards smarter, more connected operations. This demands:

- enhanced personnel and asset tracking;
- advanced environmental monitoring and safety systems;
- predictive maintenance and condition-based monitoring;
- real-time data transfer for digital twin models;
- readiness for computer vision alongside conventional maritime sensors;
- reduced dependence on complex signal cabling;
- retrofitting options with minimal operational disruption.

Building on the proven performance of its current ecosystem – integrated with Modbus, NMEA and other standard marine interfaces – ScanReach has demonstrated that robust wireless mesh networks can reliably support critical safety and operational functions in steel-heavy environments.

As demand grows for real-time data and advanced monitoring, legacy wireless systems reach limits in bandwidth, coverage and scalability. ScanReach's next-generation mesh technology is engineered to close that gap, providing a robust, high-capacity, scalable wireless backbone designed for the harsh realities of maritime and offshore installations.

Laboratory breakthrough: surpassing 2 Mb/s

In partnership with Norce, ScanReach conducted extensive laboratory tests to assess signal propagation, attenuation, and achievable data rates in steel structure models simulating shipboard conditions.

The key results were:

- stable, reliable data transmission exceeding 2 Mbit/s inside steel enclosures;
- sub-3 GHz frequencies identified as optimal for balancing penetration and capacity;
- advanced modulation schemes and error correction proven to withstand reflections and multipath fading;

› validation of mesh network benefits, including multi-hop communication and built-in redundancy.

Together, these critical milestones demonstrate the technical feasibility of replacing significant cabling entirely with high-capacity wireless networks – even under the demanding conditions found on board ships and offshore assets.

Field test insights: real-world propagation on *Olympic Taurus*

Field testing aboard *Olympic Taurus* validated lab results under authentic maritime conditions. The trials confirmed expected behaviour and revealed practical design considerations for reliable deployment in steel-heavy environments.

One of the most significant observations concerned structural attenuation. Closed watertight doors resulted in approximately 19 dB of signal loss – significant yet manageable. Metallic tape on door gaskets showed no measurable effect, confirming that primary pathways are influenced by cable gates and structural openings rather than door edges.

Similarly, closed crew cabin doors generated around 17 dB of signal loss. This highlights the need for careful network planning within accommodation areas to ensure uninterrupted coverage, especially for safety-critical applications.

Vertical propagation remains challenging: an average signal loss of 9 dB per deck, with cumulative losses quickly adding up across various floors. This reinforces the importance of deploying relay nodes or stairwell-mounted infrastructure to maintain robust connectivity between decks.

Tests along hallways with no direct line-of-sight but minimal obstructions showed only ~10 dB of loss, thanks to favourable waveguiding effects that allow steel structures to reflect and channel signals along confined pathways – enhancing horizontal reach.

These findings provide valuable input for optimising antenna choice, node placement, and overall network architecture to deliver resilient, scalable wireless coverage throughout complex vessels.

Frequency, noise and coexistence

Field testing also revealed the significant impact of frequency-dependent loss in steel environments. Attenuation increased noticeably with higher frequencies, with measurements showing that doubling the frequency from 1 GHz to 2 GHz resulted in an average signal loss increase of approximately 9 dB, well above what free-space models predict. Experts from Norce highlighted that such losses can vary between 5 and 15 dB, depending on environmental factors such as structural layout and material density.

However, the metallic ship structure itself also introduces favourable waveguiding effects. A recorded loss factor of N = 1.6, compared with the free-space standard of N = 2, shows that ship corridors help reflect and channel signals horizontally.

Background noise remained low, with only standard signals from WiFi and GPS detected – an encouraging baseline for additional wireless layers. Careful spectrum management and dynamic coexistence strategies, including channel selection and time-division scheduling, further ensure stable operation alongside existing systems.

Conclusion

Additional shipboard tests using development boards quantified signal losses from typical steel barriers, confirming that bulkheads, doors, and vertical transitions remain the main contributors to signal attenuation.

In partnership with Norce, ScanReach conducted extensive tests to assess signal propagation

Baseline received signal strength indicator (RSSI) at close range was measured at -33 dB. Closing a watertight door added about 19 dB of loss; closed cabin doors about 17 dB. Horizontal corridors showed only around 10 dB of loss, highlighting the beneficial waveguiding effects of steel structures. Vertically, losses reached about 27 dB across three decks without doors, and up to 76 dB when closed doors were included – reaffirming vertical propagation as the primary challenge.

These findings shape the design priorities for ScanReach's next-generation mesh: optimised sub-3GHz frequencies, omnidirectional antennas, a resilient multi-hop architecture, and strategically placed relay nodes to secure vertical coverage. Effective spectrum management remains essential to ensure smooth coexistence with other onboard systems. Together, the laboratory breakthroughs and real-world validation show that high-capacity, reliable wireless connectivity for steel-heavy maritime environments is now within reach.

The next generation of ScanReach's wireless mesh represents a transformative step for the maritime industry. By reducing reliance on traditional signal cabling, enhancing safety, and enabling real-time IoT and advanced digital systems, this technology paves the way for a new wave of data-driven applications on board.

From live condition monitoring and digital twins to computer vision and predictive analytics, real-time wireless unlocks smarter, leaner vessels. Fewer heavy copper cables mean simpler installations on large ships and greater payload capacity for autonomous craft – redefining how vessels can be designed and built.

Conventional single-point-of-failure cabling is giving way to industrial-grade, resilient mesh connectivity purpose-built for harsh maritime realities. As full-scale rollout advances, ScanReach remains committed to rigorous testing, strong industry partnerships and delivering the next standard in wireless maritime connectivity.

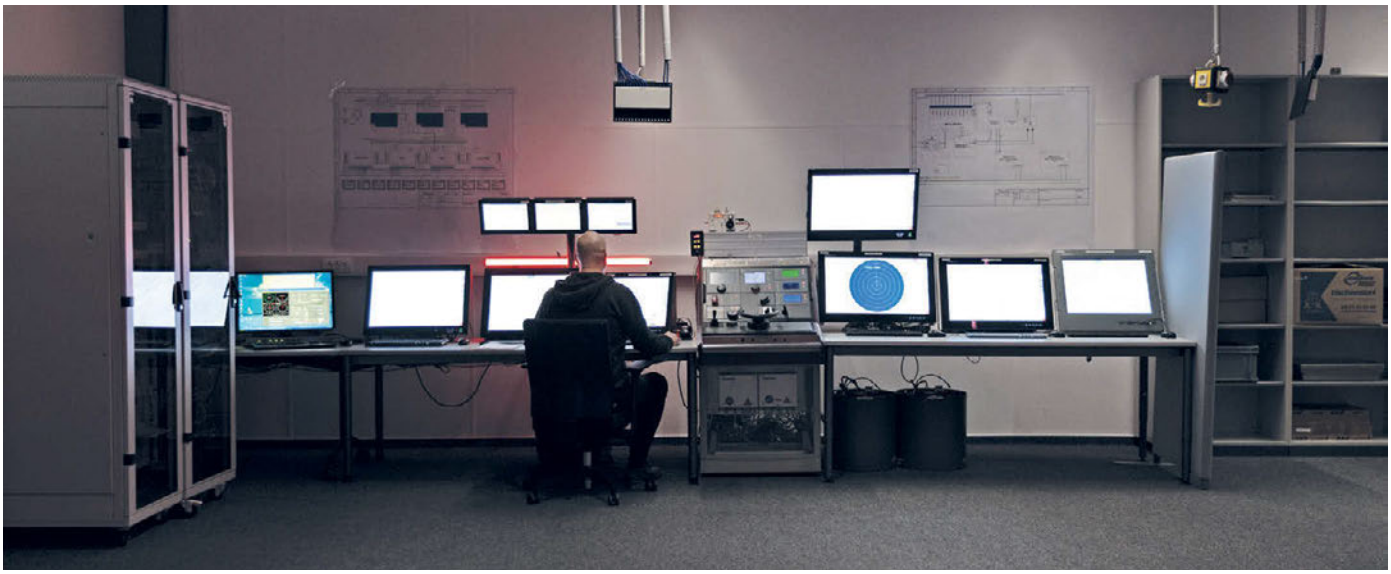
Navigation system upgrade released

SOLID-STATE TRANSCEIVERS | Kiel-based navigation specialist, Anschütz, has issued a new upgrade for its Synapsis NX Integrated Navigation System. The update integrates the company's first solid-state transceivers with the Synapsis radar software, thereby providing high quality signal processing and target visualisation capabilities. The hardware does not require magnetron replacement and therefore reduces maintenance requirements.

Furthermore, Synapsis NX expands the range of electronic chart displace information system (ECDIS) functions used by parties including coastguard authorities and offshore vessels. Features include optimal route planning, voyage management, and precise positioning. The system enhances situational awareness by digitally mapping the navigator's traditional toolkit on to intuitive user interfaces.

Designed to improve situational awareness on the bridge, Synapsis NX has a sensor data and alarm management system that ensures validated and consistent data and labels across all workstations. This means that the navigator no longer has to work with separate systems, but can operate with a single interface. Multifunctional consoles provide access to all nautical applications including radar, ECDIS, and conning from any workplace.

Over recent years, the company has installed Synapsis NX systems on a wide range of vessel types including research ships, icebreakers, multipurpose vessels, heavy-lift ships, ferries, and product tankers. Its modular design is based on standard components, racks, modern LAN technology and standardised interfaces.



The Synapsis NX Integrated Navigation System has received an upgrade

Source: Anschütz

Voyage Operations Suite combines digital systems

SEAMLESS WORKFLOW | GeoServe, a ship operation management firm, has launched GeoOne, a Voyage Operations Suite (VOS) that combines a range of digital systems used constantly in ship operation, into one comprehensive system. The Dubai-based company claims that the system is a 'world-first for marine applications', boosting productivity, improving visibility, and reducing operational challenges.

The company has developed the system to rationalise the way in which many ships are still managed. Ship operators often still rely on fragmented systems and data silos in their ship management operations, the company said. Software systems often serve only specific functions while spreadsheets and disconnected platforms are required to manage tasks including bunker procurement, vessel performance assessments, and routine accounts management.

The GeoOne system tackles the issue by providing a unified integrated setup. As its components work effectively together, the operator's ship management task is made significantly more efficient.

The company's CEO, Sanjay Kapoor, commented: "We aim to drive greater efficiency in managing commercial voyage operations. To achieve this, we seek to empower maritime operators with data-driven tools, seamless workflow integration, and scalable solutions for operational excellence.

"GeoOne is key to this development. It is a simple-to-use solution that integrates multiple functions into a single solution. If you look at what Office 365 did for business productivity, this VOS does the same for voyage operations. It connects the dots, removes duplication, and puts everything in one place," he declared.

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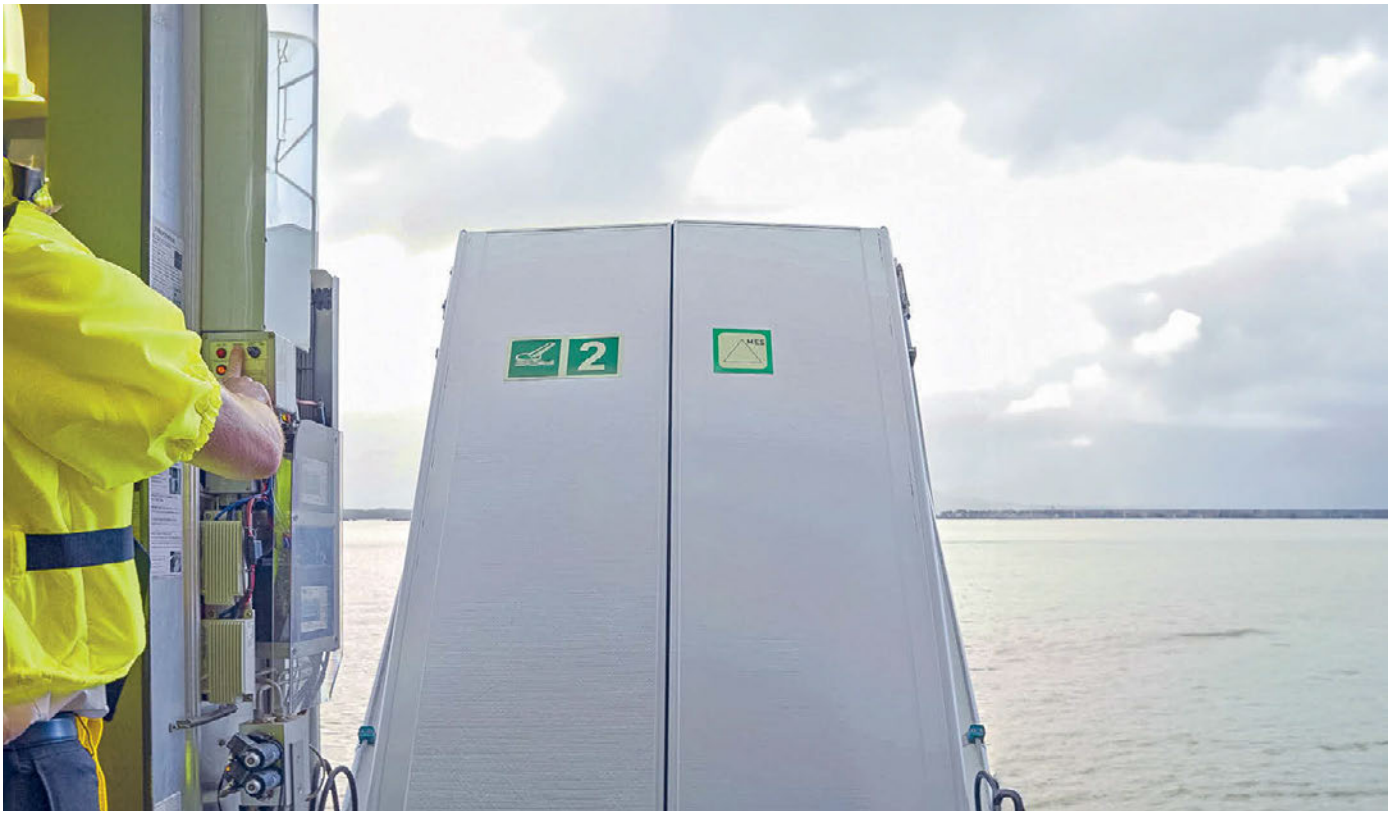
Passenger evacuation system upgraded, new functionalities added



Undertun now features a 'push of a button' activation capability

Source: Viking

COMMUTER FERRIES | Viking Life-Saving Equipment has added new functionalities to the Undertun commuter ferry evacuation system with upgrades that will enable it to be used effectively in open waters. The Danish company acquired all Undertun design, production, and supply rights last year and, since then, has made two major upgrades to the system that has been used so far in sheltered waters in Norway.

Now, the system exceeds the requirements for operation in open seas as set out in SOLAS and the IMO code for High Speed Craft. SOLAS requires sufficient evacuation capacity on both sides of passenger ferries for the disembarkation of all passengers. Most commuter ferries today carry up to 399 passengers.

However, the Undertun system, comprising a self-contained gangway and inflatable life raft unit that can be fully integrated with a side shell door, has life rafts with a 101- and 153-person capacity. Viking has now introduced a 203-person life raft as well as a new 'push of a button' arrangement enabling Undertun to be released from the bridge or from shore.

The larger 203-person life rafts now enable 200 passengers to disembark on each side of a ferry. This means that ferry operators no longer need two life rafts on each side, but only one per evacuation point.

The 203-person life raft developed by Viking has already been recognised for performance equivalent to conventional lifeboats by the Danish Maritime Authority, the Bahamas Maritime Authority, and the UK Maritime and Coastguard Agency. Classification society DNV, meanwhile, has verified that the system achieves both SOLAS and High Speed Craft compliance outside sheltered waters.

Rikke Sorrell, global sales manager Cruise & Ferry at Viking Life-Saving Equipment, said: "The simplicity of installing and operating Undertun has been behind its success in near shore waters, and the 203-person life raft offers the same seamless evacuation for larger ferries. The success of these tests confirms that Undertun performs above and beyond its requirements, and that it is far more than fit for purpose."

She noted that the new activation procedure provides significant safety benefits for ferries where crew numbers are limited. The 'push of a button' feature also enables crew to join passengers quickly on the raft after deployment.

"In sheltered waters, our tests show that 203 passengers can disembark well within the required 17 minutes and 40 seconds," she added. "Easier to operate for crew and offering faster evacuation for passengers, the Viking Undertun Marine Evacuation System now offers safer commuter ferry evacuation than ever."

The upgraded Undertun system was unveiled at Nor-Shipping in June.

Attacks reverse improving bulker stats

RED SEA | Recent attacks on bulk carriers by Iran-backed Houthi rebels in the Red Sea have reversed the dry bulk sector's steadily improving safety statistics. In the early days of July, two Greek-owned bulkers – a panamax, *Magic Seas*, and a handysize, *Eternity C* – were hit by rocket-propelled grenades, drones, missiles and small arms fire, before sinking. Four seafarers died and eight are still unaccounted for at the time of writing.

The attacks came just a few days after the International Association of Dry Cargo Shipowners (Intercargo) had revealed latest safety statistics for the dry bulk sector. Vessel losses and fatalities had continued to decline over the ten years between 2015 and 2024, the Association said, although it had registered the loss of 20 vessels of more than 10,000dwt and 89 seafarers' deaths over the period.

Groundings accounted for close to half of the accidents, but cargo liquefaction continued to pose the greatest threat to life, Intercargo said. No fewer than 55 seafarers perished as a result of liquefaction – the process by which bulk cargoes lose their solid state and take on the characteristics of a liquid. Meanwhile, cargo shifting, a different phenomenon, and the resulting impact on ship stability accounted for the loss of two ships and twelve seafarers.

Although Intercargo logged only one operational casualty in 2024, the Association noted three Red Sea attacks on bulk carriers – the *Rubymar*, *True Confidence*, and *Tutor* – which involved missiles, drones, and uncrewed surface vessels. Even though its report was published before the latest casualties, Intercargo noted that its statistical analysis demonstrated a dangerous deterioration in maritime security.

Intercargo chairman, John Xylas, commented: "The dry bulk sector should take pride in the improved safety performance reflected in this year's report. But the unacceptable attacks on merchant ships in 2024 have reminded us that safety today extends beyond seamanship and regulatory compliance; it is fundamentally about protecting human life. Seafarers must never be placed in harm's way for simply doing their jobs."

With the impact of hostile acts excluded, the statistics are encouraging. Bulk carrier losses now average just two a year with a notable decline in average fatalities over successive ten-year periods. Intercargo cited improved ship design, better crew training, and stronger regulatory frameworks as contributory factors.

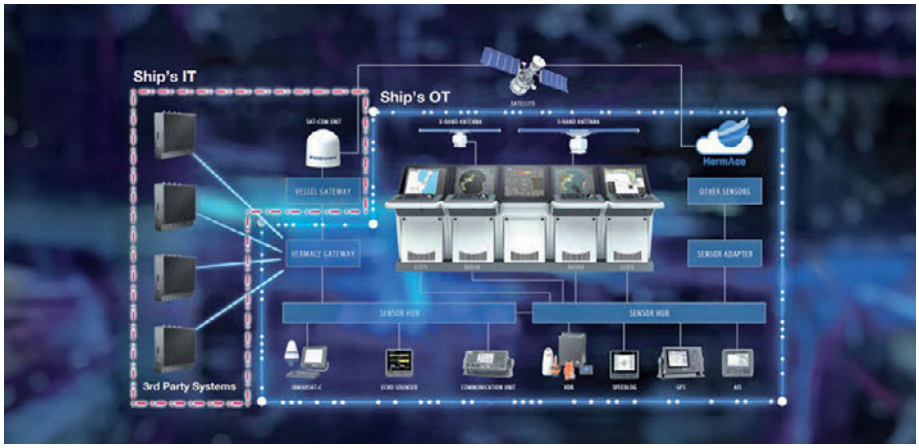
The Association is far from complacent, however. Significant risks persist, it said, including those relating to improperly declared cargoes, navigational failures and delays by flag states in the reporting of incidents. The average reporting time for owners to make submissions to the IMO's Global Integrated Shipping Information System (GISIS) is more than two years, Intercargo said.

The dry bulk fleet continues to grow, with more than 12,500 vessels in service globally as demand for bulk transport continues to climb. Intercargo has once again reiterated its frequent call for an industry-wide commitment to achieving zero loss of lives and ships. The Association has also called for immediate measures to ensure the security of seafarers in high-risk regions.

Cyber compliance assessment completed

IACS UR E27 | Furuno has completed the compliance assessment for DNV security profile 1 to satisfy the requirements specified in IACS UR E27 established by the classification society.

According to the company, this achievement highlights Furuno's leadership and dedication to secure products as a trusted partner in today's connected maritime world with the certification that its navigation and communication equipment is cyber resilient and fully compliant with the latest maritime international standards.



Cyber secure systems are mandatory in today's connected maritime world Source: Furuno

About IACS UR E26 and E27 regulations

› IACS UR E26 "Cyber resilience of ships" focuses on the cyber resilience of ships, ensuring secure integration of IT and OT systems throughout a vessel's lifecycle.

› IACS UR E27 "Cyber resilience of onboard systems and equipment" defines cyber security requirements for onboard systems and equipment individually.

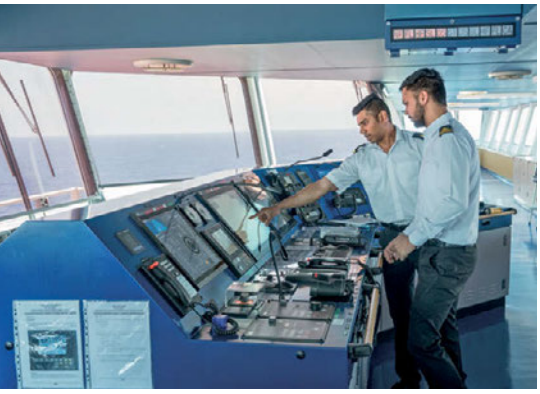
Both regulations are mandatory for newly-contracted vessels on or after July 1st 2024, and are designed to strengthen maritime cyber security across the industry.

Initiative aims at increasing number of young officers

MISSION 30 | Ship manager, Anglo-Eastern Univan Group (Anglo-Eastern) has launched a new initiative, Mission 30, to increase the number of management-grade officers under the age of 30 from just 1% to 20% by 2030. The company intends to focus on masters, chief engineers, chief officers, and second engineers.

The move comes against a backdrop of tightening seafarer supply and a rapidly increasing requirement for new skill sets among seagoing personnel. The company said it is looking ahead to cultivate a young, agile workforce for management-level positions at sea.

Anglo-Eastern established a Career Care Programme last year in which a team of its most experienced marine human resource personnel were enlisted to provide support and guidance on seafaring career development. The aim is to provide marine personnel with structured career pathways, personalised guidance, and future-proof skill sets enabling them to excel in today's rapidly evolving maritime industry, the company said.



Source: Anglo-Eastern

The Mission 30 initiative is set to motivate and support young officers in shipping

Under the WE Care initiative, the Career Care Programme provides guidance on a range of career options for sea staff. These include transitions from ratings to officers, advances in seniority, reskilling to a different type of vessel, and possible transition to jobs ashore.

The five-yearly Seafarer Workforce Report, last released by Bimco and the International Chamber of Shipping in 2021, revealed a steady increase in the average age of officers at sea since 2015. And the proportion of senior deck and engineering officers under the age of 30 has fallen further this decade.

Meanwhile, mariners highlight a range of new challenges faced in life at sea today. They include automation, the digitalisation of many functions, real-time round-the-clock communications with parties ashore, the impact of artificial intelligence, new operating systems including weather routing and just-in-time arrival and, in the coming years, a range of new fuels.

Commenting on the motivation for Mission 30, Anglo-Eastern's group managing director of Marine HR, Vinay Singh, commented: "We've observed a shift in our workforce at sea – while most of our Chief Officers and Second Engineers were once under 30, today only about 1% of our management-level officers fall into this age group. This trend poses a potential challenge as we gear up for the future – one that demands adaptability, digital fluency, and agility for innovations such as dual-fuel systems, AI integration, and smart ship technologies.

"We invite all young seafarers to seize this opportunity – to grow faster, lead sooner, and become the next generation of maritime professionals. With the right support and ambition, we can help them reach new heights in their sea career before 30. We look forward to helping them get there," he added.

Mission 30 offers personalised career ladder maps, targeted training and assessments, and Career Care team membership. This provides guidance on Certificate of Competency exams, ship-type transitions, and long-term career planning. As part of the process, new officers will be paired with well-respected peers and mentors.

By mid-June, more than 5,000 operational-level officers and cadets at Anglo-Eastern had been contacted to enrol in Mission 30.

Fleet management app to provide improved monitoring

OPERATIONAL OVERSIGHT | Iceland's Hefring Marine has unveiled a new mobile application for fleet managers which, it claims, will provide unprecedented insights and control over ship operations. It will provide powerful monitoring and control features via an intuitive mobile interface, enabling users to stay in touch with vessels regardless of location.

The system has four core features:

› Real-time fleet tracking – the application's interactive mapping system provides live positioning data for entire fleets, giving operators complete situational awareness and control over vessel movements and locations;

› Intelligent alert system – users receive instant notifications for critical events including geofence violations, custom threshold breaches, and engine alerts, enabling immediate response to potential issues before they escalate;

The Hefring Marine app is already available for download

Source: Hefring

› Comprehensive data profiles – detailed vessel and trip profiles provide operators with complete operational histories and key performance data, supporting informed decision-making and operational optimisation;

› Device monitoring – the app tracks and monitors all connected onboard devices across each vessel, delivering a complete operational picture and ensuring all systems are functioning properly.

Karl Birgir Björnsson, CEO and co-founder, said: "We've designed this solution to give intelligent marine assistance system (IMAS) users and marine professionals the real-time visibility and control they need to operate more safely and efficiently in today's demanding maritime environment."

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