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# Welcome back...

...that might be the thought in the minds of many maritime professionals at the moment – a few days before the world's leading trade fair SMM opens its doors after a four- instead of two-year break. Once again – and for the 30th time – the maritime world will come together in the Free and Hanseatic City of Hamburg for a week of innovations, presentations and networking at the beginning of September.

A lot has happened since September 2018 and the last 'proper' SMM – globally, socially, and geopolitically. The term 'disruptive', which was used almost indiscriminately long before the outbreak of Covid-19, has probably never been more appropriate than now. The unprecedented field of tension consists of so many different aspects – the pandemic, the climate crisis, Putin's war of aggression on Ukraine, energy supplies, wild fires across Europe, the Chinese claim to supremacy, shortage of skilled workers and resources – that every area of life, professional and private, is now affected.

Interestingly, one positive outcome is that people and professions from outside the industry are increasingly attentive towards maritime and logistical processes and issues. Why does it take so long for the spare parts to arrive? How will the energy supply be secured if we no longer get gas from Russia? How quickly can floating terminals come online in this country?

Will this intellectual involvement lead to a better understanding and possibly even more political support, especially for European shipbuilders and suppliers? Probably not. However, the pressure remains on an industry that is responsible for the timely transport of goods in a global context.

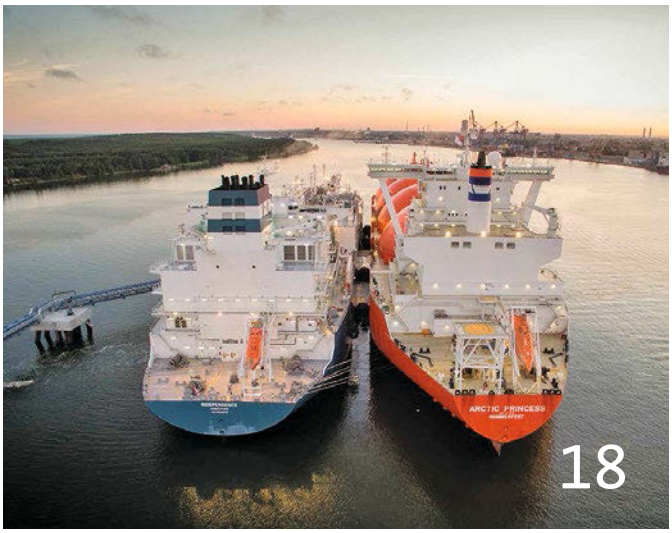
The possible energy crisis and an energy security independent from Russian gas or coal puts another very significant spotlight on the shipping and shipbuilding businesses and, of course, on the entire field of offshore renewable power. In the short run, the availability of sufficient capacity to ship LNG from countries like the United States to Europe has to be of greatest concern.

LNG carriers have long been solely built at Asian shipyards – another form of dependency that is most likely to prove a grave oversight in the near future. Especially if more ships are needed and shipyard capacities are exhausted. May this open up opportunities for European builders? Again – probably not; at least not without further ado and possibly even some state support.

In the move to transform our energy supply into sustainable resources, China also plays an important role: resources and commodities such as solar modules and rare earths are obtained from the country on a large scale. So as a trading partner, China is actually indispensable, and turning away from it would be problematic on many levels. As Bernhard Bartsch, head of External Relations of the Mercator Institute for China Studies, recently said on German public broadcasting: "There is no second China!" Countries like India, Indonesia or Brazil cannot replace China in this respect.

What to do then? The call for appropriate regulation is not new – and yet it has probably never been more urgent than now. But as said before, to hope for swift support from local politicians is probably naïve. The current developments on the world stage are supposedly more dramatic.

With all this 'luggage' that is currently keeping our minds busy, it may be difficult to remain optimistic for a bright future. However, never has it been more important to combine all possible creative energies toward a common goal. We already have the know-how and the technologies that are needed to ensure the sustainable use of existing resources – a change in thinking and probably leaving the comfort zone has to happen in people's minds.





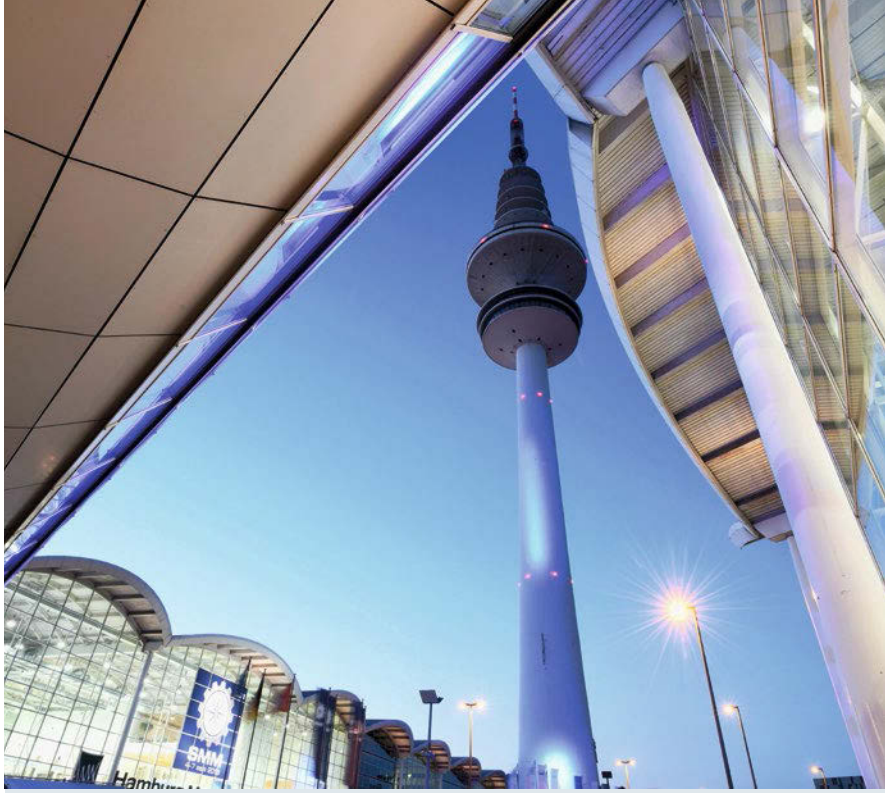
## Shipbuilding & Equipment

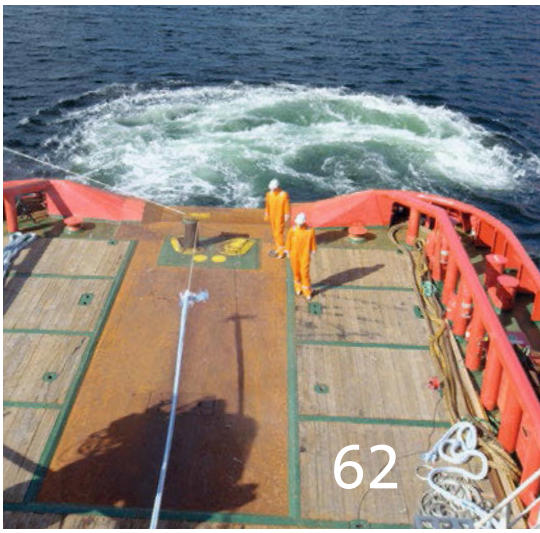


## Shipbuilding & Equipment



## Offshore & Marine Technology





# In Focus: SMM 2022



## Regulars





## Ship Operation

The contract includes the order for two vessels and an option of an additional two CSOVs Source: Ulstein

# Olympic orders two, option two, CSOVs

**SX222 design** | Norway's Ulstein Verft AS has won a deal with compatriot subsea and renewables shipowner, Olympic, for up to four construction service operation vessels (CSOVs). The 89.6m-long methanol-ready ships will be based on Ulstein's SX222 design with Twin X-Stern and four propellers. They will have diesel-electric propulsion with variable speed, and large battery energy storage systems.

Olympic CEO, Stig Remøy, commented on the hull configuration: "The Twin X-Stern is a smart concept," he said, "optimised for low energy consumption. During operation, the offshore wind service vessels stay positioned at the turbines most of the time, and with the main propellers fore and aft, these vessels will reduce the energy requirement to a new level when on DP."

He also referred to the maritime cluster on Norway's north-west coast, of which both companies are members. "As a shipowner in the Norwegian maritime cluster, it is important for us to invest in this cluster. With a shipyard, ship designer, suppliers and Vartdal Invest as a co-investor, this is a project with a strong local ownership." The two firm vessels are due for delivery over spring and summer 2024.

# First all-electric tug delivered

*Sparky* | The Damen shipbuilding group's first all-electric tug has been handed over to Ports of Auckland. The RSD-E Tug 2513, named *Sparky,* will be capable of handling the largest vessels calling at Ports of Auckland facilities and is an important step in the group's target of becoming a zero-emissions facility by 2040.

The vessel's design is the result of six years of development work between Damen and the port authority.

The RSD-E Tug 2513 *Sparky* will be deployed in Ports of Auckland facilities Source: Damen

Source: Furetank


The Vinga class is considered to be particularly energy efficient

# Furetank orders fifth dual-fuel tanker

**Vinga-class** | Sweden's Furetank Rederi AB has ordered another dual-fuel Vinga-class chemical tanker at China Merchants Jinling Shipyard in Yangzhou. The 17,999dwt vessel is Furetank's fifth and number eleven in the Vinga-class series, all of which are commercially operated by the company. It is due for delivery in July 2024. The ice-class tankers have a capacity of 20,306m$^3$ in twelve epoxy-coated tanks and are designed to operate with maximum energy efficiency and minimum climate impact. The battery hybrid vessels run on LNG/LBG and incorporate a range of fuel-saving and emissions-reducing features.

# Cooperation on electric ferry design

**RoPax** | Greece's Saronic Ferries and Dutch ship design firm, C-Job Naval Architects, have announced a new partnership to develop the first fully electric RoPax ferry in Greece.

Saronic Ferries, which revealed a new tie-up with classification society DNV on electric ferry development at the Posidonia show in Athens a few weeks ago, plans to operate a purely emissions-free fleet to all its destinations by 2040.

Having established an Athens office in 2020 to be closer to its Greek clients, C-Job has already been working on the design of a zero-emission electrically powered ferry for Saronic Ferries. The vessel, likely to be commissioned in 2026, will link the port with the islands of Aegina and Agistri. It will offer a zero-emission service provided the shoreside infrastructure in Piraeus is in place.

The new RoPax ferry will be 85.2m long, 15.8m wide and will provide capacities for 800 passengers and 85 cars or six lorries and 55 cars.


Illustration of the new ferry to be deployed in Greece Source: C-Job Naval Architects

# AiP for Suction Wing wind assistance

**Boundary layer suction** | French partners Crain Technologies and REEL have been granted Approval in Principle (AiP) by Bureau Veritas (BV) for Suction Wing SW270, an auxiliary wind propulsion device designed to provide additional forward thrust for cargo ships.

The concept, based on the principle of boundary layer suction, has a high lift coefficient and a lift-to-drag ratio that provides good performance in upwind conditions and for ships sailing at relatively high speeds, BV said.

Grids located on both sides of the wing section create a suction force that draws air around the wing section from the outside to the inside of the wing. Mounted on a structural foundation, the wing rotates around a vertical axis and adjusts to wind direction for optimal performance. The partners plan to develop Suction Wings over a range of sizes for different vessel types. However, the device that was considered for this AiP was a wing with a span of 27m.

The partners plan to develop Suction Wings over a range of sizes for different vessel types
Source: Bureau Veritas

## Modified FCS for UK Navy

*XV Patrick Blackett* | Damen Shipyards has delivered a modified fast crew supplier (FCS) to the UK's Royal Navy's 'NavyX' innovation team in a handover at the naval base in Portsmouth.

The *XV Patrick Blackett*, named after a naval officer and scientist and powered by four Caterpillar engines, is a modified 42m-long FCS 4008 with a five-person crew. The Damen X-bow provides good seakeeping and stability characteristics, the Dutch shipbuilder said in a statement.

The vessel will support the testing of new technologies and its 140m² of deck space will provide a large, unobstructed area for equipment such as unmanned aerial vehicles and autonomous underwater vehicles. The under-deck space normally used as seating for up to 100 persons has been redesigned to provide an operations centre and a meeting room.


The Newcastlemax bulk carrier, *Berge Olympus*, will be equipped with four WindWings
Source: Yara Marine Technologies

## Design of bulker sail installation

*Berge Olympus* | Singapore-based Berge Bulk has chosen Deltamarin to undertake shipside design work relating to a WindWings sail installation on board the 210,000dwt bulk carrier, *Berge Olympus*. The capesize bulker is to have four 50m-high BAR Technologies WindWings by Yara Marine Technologies installed during the second quarter of 2023.

Deltmarin has already completed a concept design for the retrofit including structural issues, stability, and other ship integration assessments. Now it will prepare detailed design drawings and other documents for class approval. Berge Bulk's Innovation Projects Management Lead, Daniel Chin, said: "BAR's WindWings system presents enormous promise, but also enormous challenges. We are confident that Deltamarin's experience and familiarity with wind propulsion technology makes them our ideal integration partner to execute the installation of BAR wings on to our vessels. Wind has a great potential for decarbonisation of both existing ships and newbuilds."

## › IN BRIEF

**Shore-side power** | The Cruise Lines International Association (CLIA), has announced its intention to promote the further expansion of shore-side power in ports. Accordingly, the cruise lines affiliated with the association are ready to purchase shore-side power as soon as it is available and to work closely with port operators.

**Record order book** | Damen Shipyards Group's order book rose to a company record of EUR 8.8 billion as at year-end 2021. Part of that rise was due to the acquisition of an order for no fewer than 99 vessels in the Workboats division and a record number of orders for Damen Yachting.

**Spin-off** | Following a decision by its board of directors, ABB has announced its intention to spin off Accelleron (formerly ABB Turbocharging), its turbocharging division, by way of a dividend in kind of Accelleron Industries Ltd's shares to ABB's shareholders. Accelleron's listing on SIX Swiss Exchange in Zurich is planned for October 3, 2022, and is subject to, among other provisos, approval by ABB's shareholders at an Extraordinary General Meeting.

**ESG standard** | Florida-based shipping, energy and logistics group Crowley has signed up business sustainability ratings provider, EcoVadis, to assess and monitor its value chain relating to suppliers' environmental, social and governance (ESG) standards.

**Digitalisation tools** | German shipowner OKEE Maritime, which manages a fleet of ten container vessels in regional feeder services worldwide, has adopted StormGeo's digitalisation tools to improve environmental performance, including StormGeo's route optimisation and fleet performance management systems.

**Acquisition** | Bremen-based automation company besecke GmbH & Co KG, has acquired Hamburg-based software start-up Dintegra GmbH. The company's core product is the CMMS (computerised maintenance management system) software for supporting maintenance work in the maritime sector.

# NCL's latest class of vessels takes shape


Shortly after the delivery of *Norwegian Prima*, *Norwegian Viva* was floated out at Fincantieri's Marghera shipyard Source: NCL/Camilla Bach

**Fincantieri** | Miami-based Norwegian Cruise Line (NCL) has taken delivery of the 294m-long *Norwegian Prima* at Fincantieri's Marghera shipyard in Venice.

The first of six ships in the Prima class, the 142,500-gt *Norwegian Prima* has a capacity of 3,215 passengers and is powered by diesel-electric machinery and two ABB Azipods. Speaking at the delivery ceremony, Norwegian Cruise Line president and CEO, Harry Sommer, said: "Today, we usher in a thrilling new era in cruising as we celebrate the delivery of *Norwegian Prima*, the long-anticipated first ship in our extraordinary new Prima class. She is a true testament to our Guest First philosophy as well as our commitment to deliver unforgettable experiences that exceed expectations." Five more vessels in the Prima class will join NCL's fleet between now and 2027. The second vessel, the *Norwegian Viva*, was floated out at the Marghera shipyard a few days after the handover. It will be delivered next summer.

## Acquisition enhances software

**BunkerMetrics** | Alfa Laval is to buy Denmark-based BunkerMetrics, a fuel decision support software provider, and merge it with its recently acquired weather intelligence subsidiary, StormGeo.

To be added to StormGeo's s-Suite subscription service, BunkerMetric's decision support on ship fuelling will now become a key element in StormGeo's weather routing and voyage performance software. The bunker company uses sophisticated algorithms to optimise fuel procurement strategies and help shipping companies to save money, an Alfa Laval statement explained.

# Second large E-Flexer to boost Stena's capacity on Sweden-Poland route


The *Stena Ebba* will join the fleet in December Source: Stena Line

***Stena Ebba*** | The second of two large E-Flexer RoPax vessels, *Stena Ebba*, is set to join sister vessel, *Stena Estelle*, in December on the route between Karlskrona, Sweden, and Gdynia in Poland. The first ship, *Stena Estelle*, will be deployed on the Baltic Sea service from August.

The largest E-Flexer vessels so far, the 240m-long RoPax units are 36m longer than the three existing E-Flexers operated by the company. The ships will be able to take 15% more cargo and accommodate 30% more passengers. They will have capacity for 3,600 lane-metres of vehicles and rolling cargo. Stena Line CEO, Niclas Mårtensson, said: "The southern Baltic Sea is a key region for Stena Line and our route Karlskrona-Gdynia is a backbone for our ambition to grow and expand further. *Stena Ebba*, together with the twin vessel *Stena Estelle*, will set new standards of flexibility, service orientation, and customer satisfaction."

# Platform for efficiency gains

**CII** | Singapore-based X-Press Feeders is to deploy the ZeroNorth platform together with its ship, voyage and carbon intensity indicator (CII) optimisation systems across its feeder fleet of more than 100 vessels.

The ZeroNorth platform provides an indicator of ship and fleet performance and uses a wide range of data and fuel models to make recommendations on reducing emissions and maximising CII ratings. The nature of feeder operations provides significant scope for fuel efficiency initiatives. Feeder ships work on tight schedules and precise arrival times in frequent port calls. These have been disrupted recently by widespread port congestion. Data-based insights offer a reliable near-term way for feeder ship operators to raise efficiency and cut carbon emissions.

The deal will see the ZeroNorth platform and its suite of vessel, voyage and CII optimisation services used across X-Press Feeders' more than 100 vessels Source: ZeroNorth

Drydocks World-Dubai, a subsidiary of DP World, is the largest centre in the Middle East for ship repair, conversion, new builds, and rig maintenance

Source: Drydocks World

# Strategic agreement signed in Dubai

**Resistance reduction** | Dubai-based Drydocks World and air lubrication specialist, Silverstream Technologies, have signed a strategic agreement to promote the resistance-reducing system as the shipyard becomes an approved installation provider.

Air lubrication offers significant scope to reduce fuel consumption and emissions and Silverstream systems are now being installed on a range of new vessels. However, the technology also provides potential for cutting fuel use on existing ships as they become subject to new IMO emission regulations from next January.

Drydocks World CEO, Capt. Rado Antolovic, said: "We are pleased to sign this partnership with Silverstream, an innovative provider of clean technology, as part of our commitment to enhancing the environmental performance of shipping. Together, we intend to share technical expertise and promote a proven efficiency solution to minimise the maritime industry's carbon footprint."

# *Ever Alot* built to ABS class

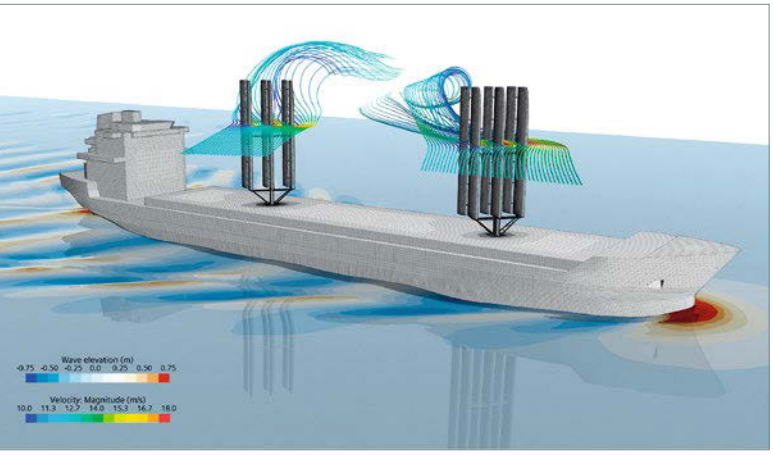
**Container giant**| Taiwanese container line, Evergreen Marine, has recently commissioned the 24,004-TEU *Ever Alot*. The vessel is the latest in a series of 15 A-class ships being built for the company at shipyards in South Korea and China. It is number seven of nine A-class ships being built to ABS class at China's Hudong-Zhonghua Shipbuilding. The 400m-long *Ever Alot* has now been deployed on the trade between Asia and Europe.


Source: ABS

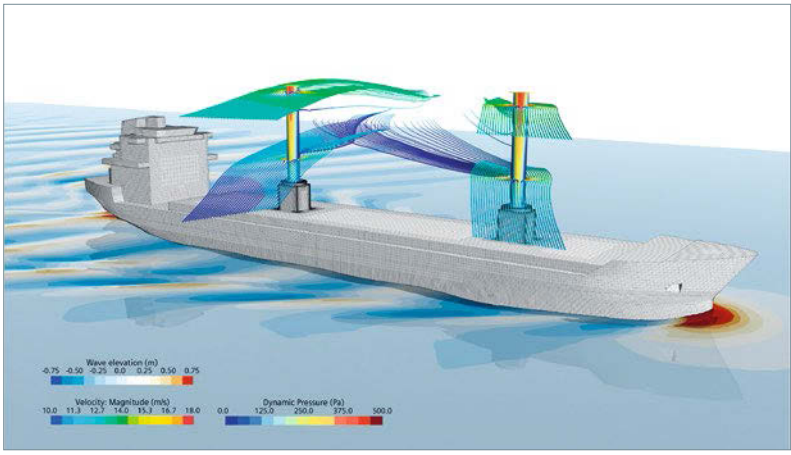
The *Ever Alot* is claimed to be the world's largest container ship

# Comparing the efficiency of wind-assisted propulsion devices

**SIMULATION WORKFLOW** UK-based Cape Horn Engineering has developed a simulation workflow to compare the efficiency of wind-assisted propulsion devices. The results demonstrate that designs can be specially tailored to suit ships' characteristics and operating conditions.




Cape Horn Engineering has developed a simulation workflow to compare the efficiency of wind-assisted propulsion systems




One of the configurations modelled two Flettner rotors

Source for all images: Cape Horn Engineering

Computational fluid dynamics (CFD) is a crucial support for naval architects to optimise designs for critical elements, such as weight-saving, performance predictions, reducing emissions and ship optimisation. Cape Horn Engineering specialises in CFD and related marine technologies which offer a holistic analysis of the benefits of wind propulsion technologies.

The company also specialises in high-fidelity RANS-based simulation techniques where accurate forces and moments are obtained for the given shape candidates and operating conditions.

Cape Horn Engineering recently developed a simulation workflow to compare the efficiency of wind-assisted propulsion (WASP) devices. The simulations assess the most important effects of adding the wings, Flettner rotors or any other type of wind-powered device to the vessel. Both the water flow around the hull at a given vessel speed and the air flow around a ship's topsides, superstructure and wind-assisted ship propulsion (WASP) devices, at a certain wind speed and direction, are modelled simultaneously in a single simulation.

The wind conditions above the water surface are modelled with an accurate wind profile taking into account the atmospheric boundary layer wind gradient, which results in a variable wind speed and direction at different heights. In the simulations, the vessel sails at a constant speed, and an actuator disk models the effect of the propeller. Depending on the vessel resistance and the amount of thrust generated by the WASP devices, the actuator or virtual disc model determines the propeller revolutions and torque and thus delivered power.

The simulation further considers the deformation of the free surface of waves generated by the vessel, the dynamic sinkage and trim, the drift or leeway angle, the heel angle, and the rudder angle to keep a constant course. Thus, six degrees-of-freedom are considered.

The wind forces on the hull, superstructure and WASP devices induce the drift and heel angles, with the rudder angle changing during the simulation with the application of a proportional integral derivative (PID) controller, balancing the yaw moment of the whole system. The vessel speed is constant with the propeller rpm, and therefore torque and power respond to the drag of the hull and thrust from the WASP device.

The thrust produced by the propeller balances the degree-of-freedom in direction of travel. When the simulation converges to a quasi-steady solution, different WASP configurations can be directly compared by assessing the delivered power of the propeller and thus a direct measure of the potential saving in fuel and emissions can be measured.

For the study, three configurations were compared. The 16,900dwt general cargo ship *Regal* was used as this vessel has been the object of study in the Workshop on Full-Scale Ship Hydrodynamics organised by Lloyd's Register in 2016.

- The first configuration was for the vessel without WASP devices;
- The second configuration added two solid wing setups. The solid wings are based on WindShip Technology's patented three-wing-three-flaps assemblies, not in their latest design, and scaled to be 22m in height;
- The third configuration contained two Flettner rotors instead of the solid wings. The dimensions of the rotors were used without any further considerations and were approximately as tall as the wings.

No attempt was made to trim the angles of the wings' main assemblies and flaps for best performance. The trim angles were chosen such as the flow is attached and the wings are producing a reasonable amount of thrust. The same trim angles were used for the forward and the rear wings. Likewise, the rotor dimension or operating speeds were taken as nominal values with no optimisation study performed. The rotor rotation rate was chosen to be a reasonable value of 300 rpm, the same for both forward and rear rotors.

The aim of the study was not to give a quantitative comparison and show the merits of one type of device over the other, but rather to demonstrate the capabilities of the developed simulation setup to compare different types of WASP devices with a highly accurate all-in-one six-DOF hydrodynamic and aerodynamic simulation.

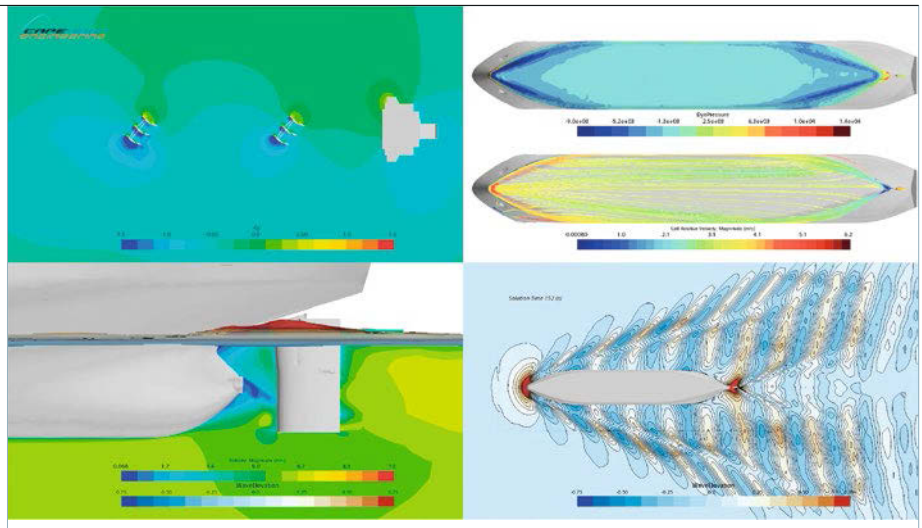
## Investigations

For the cases presented here, the vessel is sailing at 12 knots, with a true wind speed of 20 knots and the true wind direction (course wind direction relative to the direction of travel) is 90 degrees from the starboard side.

## Optimisation studies

Cape Horn Engineering has performed optimisation analyses. Most notable was the WindShip performance and optimisation study that compared many different design parameters and operating conditions. The first phase of the optimisation varied wing geometry, with parameters such as chord length, main/flap element chord ratio, section profiles, wing-to-wing spacing, and element gap size investigated until the highest performing geometry was found.

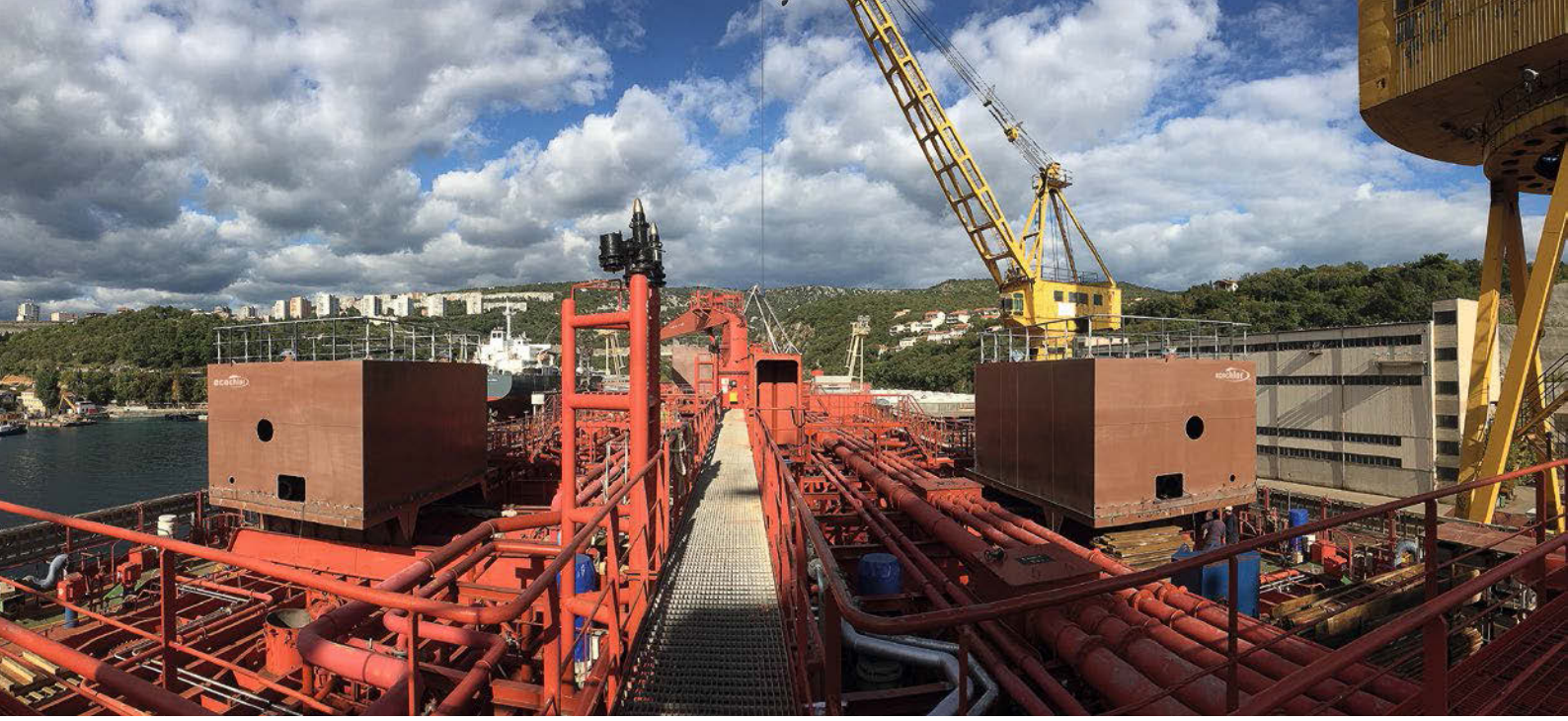
The study then went on to find the optimum operating conditions with a sizeable matrix of over 150 points. This matrix explored many variations of wind speed, wind direction, wing angle and flap angle to find the maximum thrust capabilities of the WASP device. The same process could be used when developing new WASP devices, and with a specific vessel in consideration, the designs could be specially tailored to suit the ship's characteristics and operating conditions. Moreover, with the development of the latest simulation methodology outlined, the ship design and WASP design can be coupled to achieve even greater performance improvements.



| Configuration | Driving Force [kN] | Side Force [kN] | Rudder Angle [deg] | ΔHeel [deg] | Drift [deg] | Rotor Power [kW] |
|---|---|---|---|---|---|---|
| No WASP | - | - | -1.65 | - | 0.67 | - |
| 2 Solid Wings | 53.6 | 61.5 | -2.96 | 0.12 | 1.64 | - |
| 2 Flettner Rotors | 35.2 | 37.9 | -1.74 | 0.09 | 0.98 | 37.9 |

| Configuration | Propeller Speed @12kn [RPM] | Propeller Delivered Power [MW] | Power Reduction with WASP [%] |
|---|---|---|---|
| No WASP | 105 | 2.35 | - |
| 2 Solid Wings | 97 | 1.78 | 24 |
| 2 Flettner Rotors | 100 | 2.03 | 14 |

The tables show the propeller delivered power for the three configurations, WASP devices driving and side force, rudder angles (negative is weather helm), heel angle, drift angle, trim angle, and rotor consumed power



View of main deck and installation of two filter deckhouses

Source for all images: Ecochlor

# Installing and servicing BWMSs in difficult times

**ECOCHLOR** The shipping industry has been struck by widespread disruptions due to the pandemic, travel restrictions, sanctions, crew shortages as well as shipyard and manufacturing closures. Executives at US-based Ecochlor tell what it has taken over the past two-and-a-half years to continue providing customers with the level of service they have come to expect when installing and maintaining ballast water management systems (BWMS).

"Nothing can beat good planning by passionate people, not even a pandemic. Determination and communication between key stakeholders, together with the advance planning prior to the drydocking helps a lot," declared Matthaios Noutsos, service and operations manager, Europe and Middle East, at ballast water management specialist, Ecochlor. "The job I perform requires constant contact between all the stakeholders in the process: the manufacturer, shipowner, shipyard, integration engineers and regulatory agencies.

"Whilst the installation is in progress, we meet regularly and send daily reports that track progress as well as identify any concerns to the appropriate team member. In order for us to provide the first-class services our clients need we are available in three time zones, seven days a week, 52 weeks a year – the sacrifices are obvious, but the rewards are great as well," said Noutsos.

As someone who is constantly on the road, he explained that, with the onset of the pandemic, travelling itself was one of the greatest challenges in his job and it continues to be so to this day in many countries.

"Travelling sometimes requires nerves of steel as we can be faced with difficulties with such basic needs as finding an open hotel and even securing food and water," Noutsos revealed. "No matter the numerous flight cancellations, quarantine restrictions and associated travel difficulties, our persistence pays off when the job is executed successfully, meaning that the vessel is now compliant, the crew well-trained and the owner is happy."

As with other BWMS manufacturers, the Ecochlor field teams were under a lot of pressure to maintain the same level of service that the customers expected prior to the pandemic. This oftentimes meant an increased workload for teams in the busy service hubs. In direct response, Ecochlor executives took decisive action early-on to increase quickly the number of local service team members worldwide.

"When travel bans were in place, we increased our service engineer capacity, offering more localised representation in major maritime hubs and our other locations around the globe, whilst continuing to identify and train qualified authorised service partners." said Michael Madely, vice president of Global Services "Through these efforts we were able to drastically reduce the time and the difficulties associated with travel to other countries."

Additionally, the engineering team rolled out remote access kits that allowed them to see their equipment operate with-

Installed Ecochlor ballast water management system

out the need for a physical presence on board the ship and to make any necessary edits to human-machine interface settings or assist in troubleshooting with the crew in real-time. The remote kits reduce the number of trips to vessels that are required, as well as increasing the service team's efficacy when going on board the ship as they are better prepared for the visit.

## Component availability

Coinciding with the pandemic, which produced an additional array of lockdowns and restrictions on travel, the Russian-Ukraine war has increased an already hindered supply chain process resulting in port congestion, dangerous conditions for some seafarers, longer periods in transport and increased freight costs. The war has also exacerbated crew shortages.

As quoted in The Economist magazine, "the era of predictable unpredictability is not going away." The emergence of omicron, and other highly infectious Covid-19 variants, have only emphasised instabilities in the shipping industry.

In the early days of the pandemic, which many see as the trigger for supply-chain disruptions, Ecochlor started researching multi-sources for some key components, especially outside of locations where deliveries were impacted by manufacturing shutdowns. Additionally, the company's manufacturing processes were streamlined to ensure maximum attention was given to reduce the lead time for deliveries in order to provide more support to clients in meeting their installation timelines.

"Procurement and logistics have always been strengths of our company" said Mark Wells, senior mechanical engineer. "It's important because vessels rely on having BWMS deliveries at the yard prior to start of the dry-dock installation period. When Covid-19 first hit, extra efforts were made by our engineering teams and field service engineers to maintain our delivery and commissioning deadlines."

Currently, BWMS manufacturers are focused on supply chain risk management so that they can proactively identify issues and deal with them in good time. This identification of risk, and the potential impact of it, is a critical step if delays and associated issues/costs are to be avoided.

Wells cited an example of one such issue his company grappled with regarding chain supply management. He said: "From the start of our production, Ecochlor BWMS used glass reinforced epoxy (GRE) materials for pipework inside and outside of the chlorine dioxide ($ClO_2$) generator. However, during the pandemic there were occasional delays in the supply chain of this component.

Our engineers investigated the options for alternatives should the supply of GRE materials be problematic. At the time, it was well-known that land-based $ClO_2$ generator suppliers were using chlorinated polyvinyl chloride (CPVC) for their pipework, so our research resulted in two vendor options (approved by the relevant regulatory agencies) being selected and it has now been integrated into the Ecochlor Generator engineering designs. As an added bonus, the change to CPVC pipework also realised a reduction in material costs as well as offering easier assembly.

## Conclusion

Ecochlor's CEO, Andrew Marshall, commented: "Even though shipping delays have significantly increased between China, United States and European ports, I remain optimistic that these issues will soon ease as ports are reopened and people begin to work 'normally' again. Until that day, it is important that manufacturers make resilient plans that take account of likely disruptions and thus have the flexibility to quickly resolve them."

"At Ecochlor, we have worked hard to integrate improvements to our supply chain management programs which, coincidentally, have improved the overall performance and efficiency of our company," he continued. "We firmly believe in the importance of a multi-stakeholder approach, with owners, integration engineers, shipyards and regulatory agencies all engaged so that we may be sure of the most positive outcomes for all concerned."

As Dmitri Alvarado, Ecochlor Equipment & Parts Liaison, stated: "There will always be things outside of our control that we must face head on. We must be prepared to rely on each other to find solutions. For us, the silver lining in all this is that our team as a whole has rallied together. Despite the tribulations of recent years, our procurement, operations and service teams have grown stronger than ever. I believe that what ultimately drives us all to success is our vision of protecting the environment, our values of doing it with integrity, and the respect we have for all our employees and clients."

Chemical tanks are being prepared for installation


Service team boards the vessel

# Project to assess impact of CCS on 2030 carbon targets

Source: Wah Kwong


The study will assess the potential for CCS installations on board existing bulk carriers

BULK CARRIERS | Three partners have launched a study to assess the potential for carbon capture and storage (CCS) installations on board existing bulk carriers to help meet 2030 carbon intensity indicator (CII) targets. Bureau Veritas Marine & Offshore (BV), Wah Kwong and Shanghai Qiyao Environmental Technology Co Ltd have signed a cooperation agreement first to examine the potential for CCS technology and installations on board two types of bulk carriers, but also to pave the way for further investigations into CCS installations on tankers in future.

CCS technology has been used in land-based industries for many years. However, marine applications of the technology face different challenges, including safety, layout, energy consumption, and economics.

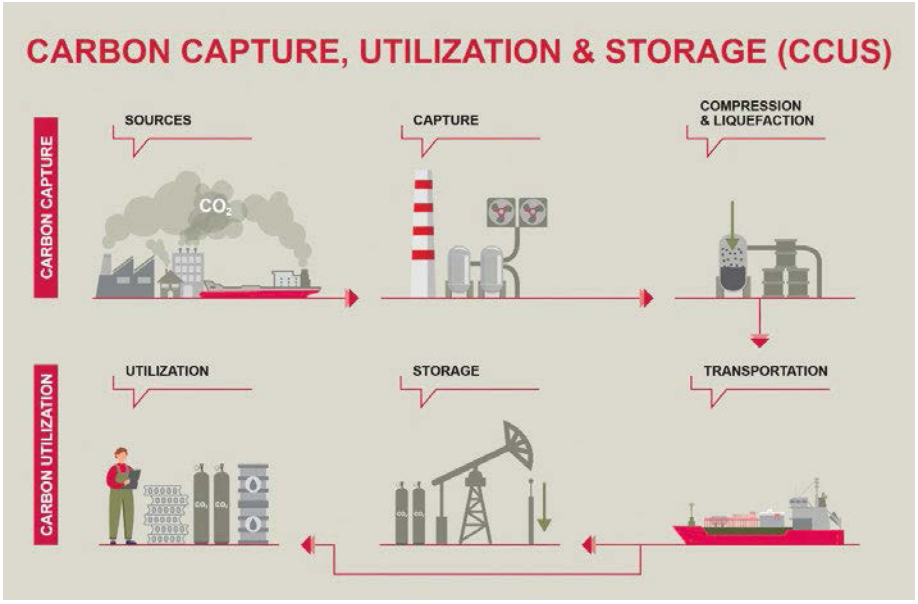
Qiyao has already developed customised designs of CCS units for the Wah Kwong bulk carriers and submitted drawings to BV for review. The classification society assessed the plans according to existing rules and regulations, and to ensure that the necessary carbon emission reduction targets could be achieved during the ships' operation.

The system, developed by Qiyao, has been tested in a laboratory environment in which it achieved a carbon capture rate of more than 85%. This figure is expected to rise as the system continues to be refined. Design approval for the CCS unit, which can be modified for different ship types and sizes, is now under review.

The setup consists of units for absorption, separation, compression, refrigeration, and storage. BV explained that the organic amine compound solution reacts with the carbon dioxide in the absorption unit, separating it from the rest of the exhaust gas. "The dissolved carbon dioxide compound solution is desorbed at high temperature in the separation tower before the extracted carbon dioxide is compressed, purified, and cooled into liquid carbon dioxide and stored in a low temperature storage tank," the classification society said.

Alex Gregg-Smith is BV's senior vice president and chief executive, North Asia & China. "The transition to a greener shipping industry is critical," he declared. "Carbon capture, utilisation and storage (CCUS) technology captured a total of 40 million tonnes of $CO_2$ in 2021 according to the International Energy Agency, notably in industrial projects on shore.

"This makes CCUS one of the options available today that could significantly contribute to achieve carbon neutrality, as well as a promising avenue for reducing emissions from shipping," he continued. "We are very honoured to collaborate on this study. BV's expertise in supporting CCUS projects, combined with Wah Kwong's and Qiyao's technical and strategic capabilities, will help to spur the implementation of CCUS technology in the shipping industry."




Infographic visualising carbon capture, utilisation and storage

Source: Bureau Veritas

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# First hydrogen-powered tug to enter operation in 2023

HYDROTUG | What is claimed to be the world's first hydrogen-powered tug was recently launched at the Spanish shipyard Astilleros Armon and will enter operations at the Belgian Port of Antwerp-Bruges in early 2023.

The main propulsion system of the Hydrotug will consist of two Schottel RudderPropellers of type SRP 460 (2,000 kW each) with propeller diameters of 2.4m. With this thruster configuration, the 31m-long and 12.5m-wide vessel will achieve a bollard pull of about 65 tonnes.

Drive system of Hydrotug Source: Schottel

Launch of the vessel in Spain

Source: Javier Carbajales

Jacques Vandermeiren, CEO at Port of Antwerp-Bruges, said: "With the Hydrotug, the Port of Antwerp-Bruges is making an important step in the transition to a sustainable, $CO_2$-neutral port. The port is systematically pursuing a policy of making its entire fleet eco-friendly by incorporating the most environment-friendly technologies available on the market."

The SRP units are driven by combustion engines that burn hydrogen in combination with diesel. Combustion of hydrogen does not emit any $CO_2$, and the particle filter combined with the catalyser will result in minimal emissions of NOx and particulates, Schottel said in a statement.

# PSPC-compliant epoxy primer off to a flying start

CORROSION PROTECTION | A general purpose anti-corrosive universal primer, E-Marine 2000, introduced to the Chinese market by Nippon Paint Marine last year, has notched up sales of 640,000 litres so far. The first coating of its type to be manufactured in China specifically for the booming Chinese shipbuilding industry has been ordered by shipbuilders there for applications to 15 bulk carriers, eleven pure car truck carriers, four 7,000-TEU container ships, and a 6,300m$^3$ LPG carrier. All of the ships are due for delivery during 2023 and 2024.

E-Marine 2000 and its low temperature equivalent, E-Marine 2000 LT, have been formulated to provide a flexible general-purpose primer that complies with MSC-215(82) provisions on performance standards for protective coatings (PSPC) in ships' ballast tanks. In addition to ballast tanks, the primer is suitable for application to the underwater hull, boot tops, topsides, decks, and cargo holds of ships. This means that the high-volume coating, with 80% solid content, can provide long-term corrosion protection over more than 70% of a newbuild structure.

In ballast tanks, the necessary nominal dry film thickness of 320µm requires two coats, but for other parts of ships, the primer can be applied in one coat with a minimum and maximum dry film thickness of 80µm and 1,800µm respectively. Compared to some other primer products, Nippon Paint claims a short curing and coating interval time. Depending on temperature, a full cure can be achieved in seven days, the company said.

In its low-temperature version, E-Marine LT can be applied at ambient temperatures ranging from -5°C to 10°C. At a temperature of zero, a full cure is possible within 18 days.

Nippon Paint's senior director in Shanghai, Gerald Mao, commented: "A general purpose, universal primer is a key priority for shipyards as a primer that can be applied to all parts of ship – including ballast water tanks – offers significant commercial technical advantages. As this anti-corrosion paint has been certified for use as a ballast tank coating, more than 70% of a newbuild's undercoat requirement can be met with just one system."

# Subscription for 'clean hulls and hull intelligence'

ROBOTICS | Armach Robotics, a spin-off from US-based Greensea Systems Inc, is to offer a subscription-based service for robotic hull cleaning using autonomy, intelligence and data fusion. The company claims the cleaning setup will ensure 100% coverage of the hull surface, excluding niche areas.

Armach uses Greensea's navigation systems to ensure that the robot cleans the hull as quickly and efficiently as possible. However, as it cleans, the robot builds up "an inch-perfect mental map of every feature of the hull", the company said, "so that it can be more efficient next time". Smart software facilitates this process, without any input from divers or operators.

The setup is scalable and its efficiency means that hull cleanings can be undertaken more often. This means that it is only ever slime that the robot must tackle. This, in turn, avoids possible damage to coatings and ensures their longevity.

The system is designed to provide updates to shipowners and operators, effectively creating a hull condition survey at each cleaning process. Damage or corrosion is identified by the robot's cameras and sensors, the company explained, enabling a decision to be made on whether further action is required or whether a monitoring programme will be sufficient for the moment.

Armach said that it is currently in the 'build it prove it' phase. This will enable it to demonstrate that the technology and the business model both work in the real world. It is also working with first adopter partners ahead of a wider roll-out of pilot projects in the balance of this year.

Ben Kinnaman is Greensea Systems and Armach Robotics CEO. He outlined the reason for the spin-off.

"You can't offer shipowners 100% hull cleaning coverage using an autonomous robotic solution unless you have a very accurate navigation solution. We (Greensea) began working with the Office of (US) Naval Research back in 2018 on just a system to make proactive in-water cleaning with a robotic solution a reality for the first time. But we couldn't find a manufacturer or vehicle partner that would enable us to enter this industry and achieve the level of potential that we saw. So we have spun the Greensea technology out into this new entity, Armach Robotics."

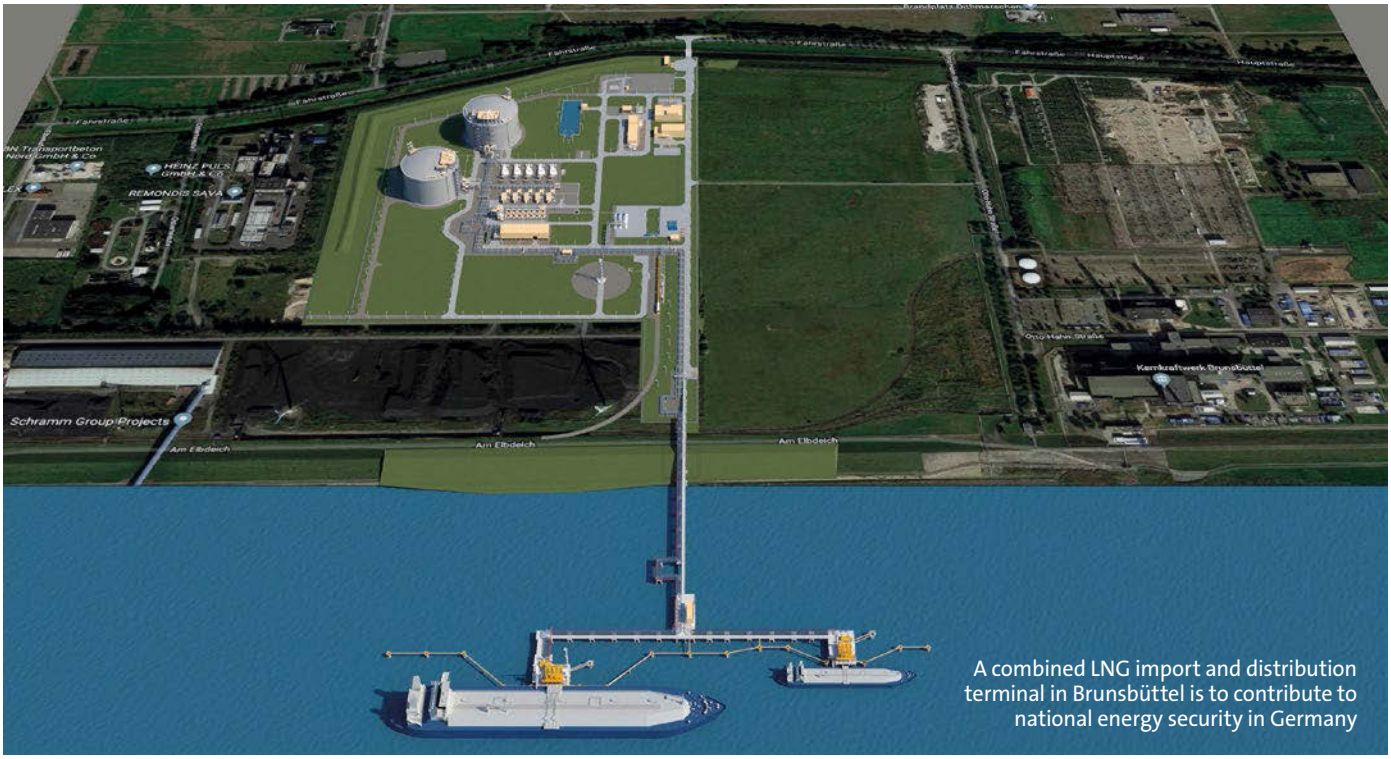
Rob Howard, Armach's vice president Growth and Strategy, added: "Hull drag is time and money in the shipping business. The system we have devised represents the closest any company has got to fully autonomous hull cleaning. With our navigation solution, the robot's route across the hull is optimised to within inches ensuring no areas are missed or overcleaned, so we can be efficient and fast in performing our service."


The robot has been developed to clean the hull as quickly and efficiently as possible while creating a "mental map" of the surface

Source: Armach Robotics

# Pandemic and war cast shadows of global energy supplies

**VESSEL SHORTAGE** Economists are warning that major regions of the world are hurtling towards a full-blown energy crisis. Some governments in Europe are already introducing energy-saving regulations in the hope of avoiding a bleak winter in just a few months' time. Even the spectre of short-time working has been mentioned by politicians in some of the continent's largest economies. LNG, as a relatively clean hydrocarbon, was thought to offer a short-term option which would not derail the energy transition. But Lloyd's Register's gas supremo, Panos Mitrou, has warned that a shortage of LNG carriers by 2025, possibly before, could prove a major constraint, writes freelance journalist Paul Bartlett.




Source: German LNG

A combined LNG import and distribution terminal in Brunsbüttel is to contribute to national energy security in Germany

According to figures from Clarkson Research, more than a hundred LNG carriers worth about USD 22 billion were ordered in the first seven months of this year, exceeding the annual total of any year to date by a large margin. The new contracts took the order book to 264 ships by the end of July, more than 40% of today's 640-ship fleet. Prices are climbing: the most recent orders for relatively standard ships with few extras have been agreed at prices around USD 250 million, at least 25% up over the year so far.

The scramble for tonnage is partly driven by projects – more than 30 ships are intended to handle growing exports from Qatar, for example. But some have been ordered on spec as owners foresee a shortage of tonnage in the short-to-medium term.

## Cost of living emergency

Experts warn that large parts of the world, particularly some key economies in Europe, face a precarious energy future. The impact is already clear to see. Rapidly spiralling prices are driving a cost-of-living emergency in many countries, as food prices rocket and supply chains are stretched to breaking point.

Even the first export cargoes of grain and sunflower oil from Ukraine will not ease pressure on food supplies by much. Most of the 20 million tonnes held in the country's storage silos is last year's harvest and many of the country's farmers have neither access to, nor funds for, planting and fertilising another crop this year. Spiralling energy prices have undermined the economics of agriculture, with fertilisers, for example, beyond the reach of many farmers, even if supplies are available.

The energy crisis has arisen partly from a rebound in economic activity after the pandemic. But in Europe, it is primarily the result of Russia's war in Ukraine. Severe cuts to LNG imports through the *Nordstream 1* pipeline to Germany, for example, which relied on Russian gas for more than 50% of its supplies, cannot be made up from other sources in the ›

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The construction of LNG carriers is a highly specialised and competitive business Source: Maran Gas


Earlier this year, Germany's energy provider RWE chartered two FSRUs from Höegh LNG – operator of the world's largest FSRU fleet

quantities required. And the backdrop worsens with successive rounds of sanctions against the Kremlin.

Panos Mitrou is Global Gas Segment director at Lloyd's Register and recently expressed concerns over LNG fleet development. He is a firm advocate of LNG as a transition fuel because the world has large reserves of natural gas, many projects are either on the drawing board or at front-end engineering design (FEED) stage, and natural gas offers a significantly more attractive carbon-emissions option than coal or oil.

## LNG yards are full

However, Mitrou has said that the world's specialist LNG shipbuilders are now full until well into the second half of the decade. There are four long-established LNG carrier construction yards – Daewoo, Hyundai and Samsung in South Korea, and Hudong in China. Two more Chinese yards – Dalian and Jiangnan – have booked contracts recently. And a recent newcomer on the building scene – Yangzijiang – takes the total to seven builders.

Significantly, there are no LNG shipbuilders outside Asia. Shipbuilding experts point to the high barrier to entry. The construction of LNG carriers is a highly specialised and competitive business. Margins are tighter than in the construction of some other standard ship types, such as bulk carriers and tankers. And there are significant up-front shipyard costs relating to the LNG construction process.

Meanwhile, any marginal supplies of natural gas are being snapped up at record prices. However, apart from the United States where exports are rising, there will be only limited new supplies of gas in the near future. Producers with any spare capacity can name their price, according to Mitrou.

This does not bode well for the approaching winter months in Europe. Normally, at this time, countries are rebuilding gas stocks in preparation for cold weather. There is little scope for this at present.

Changing LNG trade patterns have not necessarily favoured the specialist band of LNG carrier owners. The expanding transatlantic trade from the United States to Europe clocks up fewer tonne-miles than imports from the Middle East or Asia. But Mitrou believes that charter rates will remain firm, thanks to higher volumes, demand for sea transport, and fleet capacity constraints.

And it is the third of these factors that could well limit scope not only for LNG's role as a transition fuel, but also to underpin the expansion of existing trades and the development of new ones. That's because the combined annual production capacity of the specialist LNG builders is about 70 to 80 ships at the most, LR has estimated. According to Mitrou, floating gas, liquefaction and the expansion of global LNG trades is likely to require up to twice this number.

## Expensive upgrades required

He has cited another cause for concern. LR's analysis of the existing fleet indicates that 400-plus LNG carriers in today's fleet are likely to fall into categories D and E of the IMO's carbon intensity indicator, thus requiring emissions-related improvements. This is largely because of inefficient steam-turbine and early diesel propulsion, and a lack of effective boil-off management systems. Expensive upgrades will be required to lift ships into the acceptable categories of A, B or C.

For older vessels where such an option does not prove viable, owners could extend their ships' lives by converting them into floating gas plant, with or without regasification. Certainly, floating technology is widely seen as the quickest way to raise import capacity and compensate for lost pipeline throughput, Mitrou noted. Germany is understood to have five floating terminals now under development.

However, such conversions will take more shipping capacity out of the market, generating greater supply pressure. In carbon efficiency terms, these old LNG carriers may have poor ratings, Mitrou said, but they still provide safe and reliable transport capacity in a sector that is coming under growing pressure.

Mitrou stressed that there are fundamental issues to consider. "We cannot have an energy transition without energy security," he said, "and there is very little of that in many import-reliant countries right now. The planet's energy security is under threat and carbon-free energy sources at scale are still many years away."

Meanwhile, with pipelined gas in turmoil, LNG carriers remain the most efficient way of transporting gas, despite the costs of liquefaction and regasification. However, as things stand, Mitrou believes that we will soon have run out of the capacity needed to ship LNG around the world in the volumes required.

# New fire protection properties for cables

GAS ENTRAINMENT | To prevent fires from spreading along cables because of the highly dangerous "gas entrainment" effect, the German company Hradil Spezialkabel has developed a special compound that is forced into the cable by a highly sophisticated pressure and extrusion process. This prevents the transmission of flammable gases via the inside of the cable.

All cores and shields inside the cable are 100% embedded so that all capillary spaces and cavities are completely filled. Hradil's HB44® range of offshore control and signal cables have RINA certification for passenger vessels and comply with IEC 60079-14 and IEC 60331-21 for hazardous areas.

In fire outbreaks, cables can often spread fire to distant spaces. This propagation is usually caused by a so-called zone spread due to a "pumping action". In other words, the cable pumps a fire into neighbouring zones and spaces. So it is not just a question of a cable itself burning and then a fire being passed on in this way. This can be effectively prevented today with a firewall. Much more dangerous is the often invisible or barely visible propagation of a fire via the inside of the cable.

The background for this highly dangerous zone entrainment by pumping action, according to the Swabian-based company, is the fact that the design structure inside the cable is not completely compact. Between the cores and fillers there are empty spaces into which flammable gases can flow and spread through a capillary action.

Even designated fire protection cables cannot prevent this zone spread. Many fire protection cables ensure a high level of insulation retention in the event of a fire – for this purpose, mica tape (muscovite mica or phlogopite mica) is generally used as the insulation material, which protects the cable effectively against high temperatures.

However, this cannot prevent the zone spread described above. The negative effect of a pumping action can even be intensified if porous filling materials, such as flowable and fibrous materials which may have hygroscopic properties, are used in the cable.

The explicit requirement of IEC 60079-14: 2014 Annex E.1 for gas-tight cables is therefore seldom met by most cables. A pumping action cannot be completely prevented, Hradil said. Corresponding tests according to IEC regulation require a 'restricted breathing test for cables', which these cables cannot fulfil, or only partially fulfil, for the reasons mentioned above.

The Hradil offshore control and signal cables HB44® not only meet the conventional requirements for cables in hazardous areas with regard to mechanical, chemical and thermal loads, but also offer safety in terms of zone entrainment.


The HB44® offshore control and signal cables are offered in 20 variants or as special designs on request

Source: Hradil Spezialkabel

# LPG engine retrofit programme completed


The *BW Malacca* was the last dual-fuel conversion in a series of 15 LPG carriers Source: BW LPG

FUEL ECONOMICS | BW LPG is set to make significant efficiency gains following completion of its 15-ship dual-fuel LPG engine conversion project. The last vessel is the series, *BW Malacca*, had its MAN B&W 6G60ME-C9.5-LGIP dual-fuel engine installed during its five-year docking at Yiu Lian Dockyards in Shenzhen, China, and has now undergone successful sea trials. The project was undertaken under the supervision of MAN PrimeServ, MAN Energy Solutions' after-sales division.

The retrofit programme, first announced in September 2018, began with the October 2020 conversion of BW LPG's *BW Gemini*, which then became the world's first commercial vessel to be powered by a two-stroke, LPG dual-fuel engine. The 15 converted LPG carriers now show output efficiency increases of about 10% compared with fuel oil, the company said, generating notable gains in total voyage fuel economics.

Michael Petersen, senior vice president and head of PrimeServ Denmark, said: "As a low carbon fuel, LPG is well on its way to becoming the new market standard in this segment. As we move towards a zero-carbon future amidst a strong, global push towards sustainability, these conversions showcase our dual-fuel engine portfolio that is future-proofed to handle whatever alternative fuels come to prominence in the decades ahead."

Petersen also noted that the retrofit programme had avoided the unnecessary construction of additional tonnage. All of the conversions, together with options, had been completed within the agreed timeframe, despite restrictions relating to the pandemic, he noted.

BW LPG's Pontus Berg, executive vice president, Technical, declared: "We could not have accomplished this ambitious project on our own. Our success lies in close collaboration with many experts in their field – MAN Energy Solutions and Yiu Lian Dockyards are two of many partners we thank for their support over the years.

"BW LPG now serves customers with the world's largest fleet of LPG dual-fuel propulsion LPG carriers," he continued. "Powered by LPG, these vessels are not only making tangible reductions in carbon emissions, but also helping our bottom line in terms of savings on compliant fuel expenses in a high-cost supply situation."

MAN Energy Solutions has now booked orders for more than 120 ME-LGIP engines, 35 of which are already in operation. Most LPG carriers of more than 30,000m$^3$ currently on order will have ME-LGIP engines, enabling them to use their own cargo as fuel. Benefits include lower life-cycle costs, reduced fuel consumption and emissions, dual-fuel flexibility, cleaner engines that are cheaper to maintain, and time and cost savings in bunkering. Compared with 2020-compliant fuels, LPG as fuel cuts SOx by 99%, $CO_2$ by 15%, NOx by 10%, and particulates by 90%, the company said.

# Methanol fuel supply systems for six new feeders

DUAL-FUEL | Alfa Laval is to supply its FCM Methanol fuel supply systems for six 1,170-TEU dual-fuel feeder container ships ordered by X-Press Feeders group company, Eastaway, in China.


The FCM Methanol fuel supply system

They are to be built at Ningbo Xinle Shipbuilding Group Co Ltd, and New Dayang Shipbuilding Co Ltd, and will have MAN B&W ME-LGIM engines that can run on methanol or conventional marine fuels.

The FCM Methanol safely supplies methanol within the flow rate, pressure, temperature, and filtration parameters specified by the engine maker, Alfa Laval said. The system can be adapted to any engine and vessel design and, since 2015, has been chosen for nearly 20 methanol projects for more than ten shipping companies.

Peter Nielsen, president of Alfa Laval Marine Separation & Heat Transfer Equipment, said: "With their ability to sail on green methanol, these vessels will be front-runners in the move to carbon-neutral operations. Methanol is a major advance on the path to decarbonisation, and the FCM Methanol can be instrumental for shipowners in making the leap."


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# New range of illuminated symbols launched


Whether for status indication or easy location, the LEDs provide high-contrast, high-visibility illumination Source: EAO

PUSHBUTTONS | Switzerland-based EAO, a specialist in human machine interface (HMI) systems, has extended its Series 82 pushbuttons with new high-contrast and vividly illuminated symbols. Reliable and clear systems are important in many applications, but in difficult operating conditions at sea, clear symbols are essential.

Illuminated symbols for pushbuttons provide quick and easily understood visual recognition of operational status, EAO said in a statement, and illuminated symbols meet these requirements with vivid LED illumination.



# Digital simulation platform

COLLABORATION | A group of leading Japanese technology companies have announced that they are to collaborate in a project to build a cooperative simulation platform, focusing on decarbonisation technology, autonomous operations, and shipyard efficiency. The programme – Maritime and Ocean Digital Engineering (MODE) – will run at the University of Tokyo, a member of the group, from October 1st.

Other companies in the grouping include NYK subsidiary Monohakobi Technology Institute (MTI), Japan Marine United Corporation, Mitsubishi Heavy Industries group company Mitsubishi Shipbuilding, Furuno Electric, Japan Radio, BEMAC Corporation, ClassNK, and NAPA.

In a joint statement, the partners said: "Japan's maritime industry is facing challenges, such as developing and implementing new technologies in the context of global decarbonisation, maintaining shipping services by integrating autonomous ships to assist seafarers and improve safety, and ensuring high productivity among increasing complexity in ship design and manufacturing processes. MODE aims to address these challenges by using model-based development (MBD) and model-based systems engineering (MBSE), which are increasingly being introduced in the automobile industry."

MBD and MBSE work by examining the functions of products and components as computer models, and then checking their behaviours through simulations. The techniques can optimise complex system designs while facilitating a collaborative development process involving a wide range of stakeholders including shippers and operators, the companies said.

MODE is committed to supporting the development of next-generation technologies and skills in Japan's maritime sector, including offshore wind generation and subsea resource development, and to act as a platform for collaboration between industry, academia, and government.

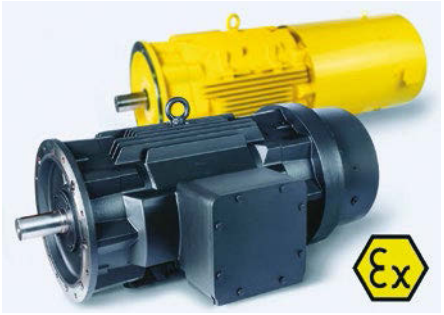
# Explosion-proof range of motors expanded

ATEX/IECEX | Germany's Ben Buchele Elektromotorenwerke GmbH has launched a new explosion-proof motor, dkD280, specifically designed for the marine and offshore markets. The ATEX/IECEx-compliant motor, which can be used in new equipment or retrofitted to replace existing ex-proof units, meets Zone 0 classification, meaning that it can be used in an area where an explosive gas atmosphere is present continuously or for long periods.

The dkD280 is suitable for a power range from 50 kW to 200 kW and voltage up to a maximum of 690 V. It is a three-phase, squirrel-cage, asynchronous motor in a surface-cooled grey, cast-iron finish. It incorporates an electromagnetic spring-operated brake with up to 3,300 Nm of braking power. Typical applications include anchor/mooring winches, hydraulic power units, axial and radial fans for ventilation and air conditioning, and pumps.

Commenting on the new motor, Ben Buchele's head of Sales, Detlef Koslowsky, said: "The ATEX/IECEx certification represents the latest milestone for a motor concept that started in 2016 when there was a growing need for ex-proof motors. We already had a strong presence in the marine and offshore markets and, even though there was a dip in the market for this type of product, we continued with research, development, prototyping, and eventually production. Customers were familiar with our motors in the 100 frame size, but this latest range represents continued evolution of the catalogue."

Koslowsky explained that the ATEX and IECEx criteria are broadly similar but the former is commonly used in Europe and the latter in many other global markets. Typically, such motors are often used in mining and other heavy-duty applications but are not suitable for marine applications. However, the dkD280 is designed with protection against sea water, saline air, and for temperatures from -35°C to 50°C (-31°F to 122°F). An upgraded version provides an even wider temperature range – from -50°C to 60°C (-58°F to 140°F). All products are also IP67/NEMA6 rated, the company said.



The dKD280 is designed especially for the marine and offshore markets Source: Ben Buchele

Koslowsky added: "The unique design of the surrounding components enables positioning of the motors without fan [IC410], with integral fan [IC411] and external fan, for S1, S2, and S3 duty types. This way, we can achieve performances from 50 kW to 200 kW with voltages up to a maximum of 690 V. It makes no difference whether your motor is operated with 50/60 Hz or using a frequency converter – all our motors are tailored to the needs of our customers."


Source: HMC

The 30th edition of SMM in Hamburg will open its doors on September 6th

# SMM celebrates six decades of exhibition and conferences

PROGRAMME AND PROSPECTS | SMM, the world's leading maritime trade fair, will again be held physically from September 6th to 9th after a four-year break caused by the Covid-19 pandemic. The organiser Hamburg Messe und Congress GmbH (HMC) expects around 2,000 exhibitors and more than 40,000 visitors from over 100 countries. Comprising eleven halls, SMM covers the sector's entire value chain, brings together managers from all over the world and represents a platform for innovations.

## Birth of SMM in the 1960s

This year, SMM celebrates its 30th edition. In 1963, the Association of Ship Engineers in Hamburg, the VSIH – hosted a congress in Hall B of the exhibition centre in Hamburg. The accompanying trade fair "Schiff und Maschine" (Ship and Engine) was held with 35 exhibitors and is considered the birth place of SMM.

## 2022 programme

The 30th SMM will focus on the maritime energy transition, the digital transformation and climate change. In 2021, SMM was held online due to the pandemic. In September, the community will be getting back together in person at the exhibition centre and at conferences with top-notch speakers.

Commenting on the four-year gap and the most pressing issue in the maritime industry, Bernd Aufderheide, CEO of HMC, said: "Nothing can take the place of personal contact between industry and other stakeholders. And an intensive exchange of ideas at trade fair stands and conferences is the only thing that will bring us closer to our aim of decarbonisation in the shipping industry."

SMM 2022 will offer the most extensive conference and networking programme in its history, according to the organisers. The topics of the high-profile conferences range from achieving ambitious climate goals and discussing the most suitable technologies for this, to questions on the responsible use of maritime resources, and geostrategic military developments in various parts of the oceans.

"This year we will be offering even more opportunities for networking, and a wider selection of free content. For the first time SMM participants will be able to present their knowledge or product novelties on so-called Transition Stages," said Claus Ulrich Selbach, business unit director – Maritime and Technology Fairs & Exhibitions at HMC. The themes these stages highlight reflect the SMM motto "Driving The Maritime Transition". One stage will be dedicated to alternative propulsion systems, environmental technologies and sustainability; another one will focus on automation, digitalisation and data management. The third stage will address interior design, outfitting and technologies for passenger ships as well as challenges and opportunities facing the cruise industry. "Following the speeches and presentations, our new networking format 'It's wine o'clock' will provide a relaxed environment for exhibitors and visitors to share thoughts and views," Selbach added.

The search for maritime specialists and junior staff, as well as current career opportunities and corresponding training paths, also gets its stage. Last but not least, SMM once again underlines its role as the leading platform for exchange in the maritime industry by giving established players, as well as start-ups, new opportunities to show their innovations – from theme-related transition stages for presentations and talks to a dedicated start-up programme, and a business-matching offer that makes it easier for participants to find new project partners.

An excerpt of selected exhibitors, products and services can be found on the following pages.

To find the entire programme with regular updates please scan the QR code or visit

**https://www.smm-hamburg.com/en/programme-exhibitors/programme/complete-programme**

# QUALITY MEDIA
# FOR MARITIME EXPERTS


www.shipandoffshore.net/smm22

DVV Media Group

Schiff&Hafen
Ship&Offshore
New Ships

## Alfa Laval Mid Europe GmbH

Hall A1, Stand 226

Source: Alfa Laval


Through progressiveness, digitalisation and thought leadership, Alfa Laval is driving progress towards decarbonisation and other sustainability goals. Alfa Laval will showcase systems and services for meeting EEDI/EEXI and CII requirements, such as the Alfa Laval E-PowerPack and the Alfa Laval Aalborg Micro economiser. It will explore how these and other systems – in fuel handling, combustion, waste heat recovery and more – are enabling the transition to low-carbon fuels.

Visitors will find a strong focus on digital services, including connectivity for Alfa Laval PureBallast 3, which will be on display. StormGeo, part of Alfa Laval, has a digital offering that extends from weather intelligence and route optimisation to simulating a vessel's CII. These services will have a dedicated area on the stand.

What's more, visitors will see how Alfa Laval is collaborating with others on methanol, fuel cells and more. Oceanbird, a joint venture in wind propulsion between Alfa Laval and Wallenius, will be among the highlighted initiatives. www.alfalaval.com

## Aquametro Oil & Marine AG

Hall A1, Stand 414

With "fit for alternative fuels", Aquametro Oil & Marine AG will use this year's SMM to illustrate which options for the reduction of $CO_2$ emissions have already reached market maturity within the maritime industry. Whether as an admixture to fossil fuels or as a pure alternative fuel such as carbon-neutral methanol, the use of fuels that are as climate-neutral as possible plays an important role in achieving climate targets. As shipping companies begin to convert their fleets to operate on alternative fuels, the corresponding measurement, control and regulation technology must also be able to measure and regulate these new fuels. "Fit for alternative fuels" enables conventionally operated ships to blend sustainable biofuels with little effort, thus reducing $CO_2$ emissions in shipping in the long term. In addition, new regulations and methods under IMO to limit shaft power – ShaPoLi – are effective ways to reduce $CO_2$ emissions. To achieve the set targets, the Aquametro Shaft Power Meter was developed as a key element of the Fuel Performance System (FPS). This is an open PLC web-based signal recording system with data-log that provides full transparency of all fuel and power parameters of the ship operation process. www.aquametro-oil-marine.com

Source: Aquametro Oil & Marine AG

Rendering of a container vessel

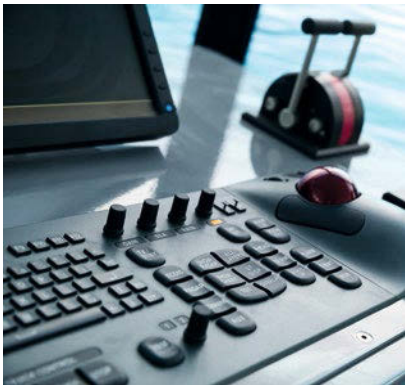
## Bachmann electronic GmbH

Hall B6, Stand 305

Worldwide, Bachmann electronic GmbH supplies comprehensive, certified automation technologies and supports its customers in the maritime and offshore sectors in integrating their systems into a powerful platform. The company is preparing intensively for the near furore perspective of autonomous shipping, which is becoming a reality through the standardisation of the interfaces between different technology suppliers. Bachmann is presenting its new developments at SMM.

The MTP standard, which describes the standardisation of communication between systems and the control level, reduces commissioning times and protocols such as DDS, enabling redundant, easy-to-integrate applications to provide information in real time. Bachmann's expertise in smart maintenance applications enables shore support during operation and prevents unexpected failures. Even though ships are currently still primarily conventionally powered, Bachmann is contributing to an environment-friendly maritime future with integrated applications for energy management and control. In conventional shipping, the company supports safe control and operation by offering Openbridge design objects in a standard SCADA version.

At the trade show, Bachmann brings together partners, customers, product managers and application engineers to exchange individual strengths, ideas, and technologies. Through these joint efforts, visions will be transformed into tangible automation applications. www.bachmann.info



Source: Fotolia

Manual ship control

## Becker Marine Systems GmbH

Hall A1, Stand 225

Becker Marine Systems offers customised technologies in the areas of manoeuvring, energy savings and emissions reduction. At SMM, the company presents the Compact Battery Rack COBRA – developed by Becker Marine Systems with maximised safety by deploying cobalt-free lithium iron phosphate (LFP) technology.

The non-flammable characteristic is one advantage of the LFP cell technology which exhibits very different fire behaviour compared with widely used nickel, manganese, cobalt technology. LFP battery chemistry does not catch fire during thermal runaway, short-circuit, mechanical damage, and makes the COBRA system a safe application for the use at sea where safety is essential. No cobalt, nickel or other heavy metals are used to produce LFP cells. Furthermore, the COBRA system provides a superior energy density, is type-approved by DNV and complies with ESTRIN requirements for inland waterways. Any scale of energy storage is available by configuring modular units in standardised battery racks of up to 1,000 VDC. The Compact Battery Rack includes integrated Battery Management System (BMS), gas exhaust and an efficient air or water cooling for safe and reliable operation.

www.becker-marine-systems.com

Source: Bender GmbH & Co KG

Bender presents technologies for the safe handling of electrical power on board

## Bender GmbH & Co KG

Hall B6, Stand 233

Bender's core competence is electrical safety in many fields, such as healthcare, renewable energy or mechanical and plant engineering. At SMM, the company demonstrates the utmost importance of electrical safety on board ships. It is a challenge to detect and localise electrical faults on board in good time, and insulation faults can generate currents that endanger the safety of crew and passengers. They also may accelerate the corrosion of ship parts.

Whether in the engine room, in accommodation areas or cabins, electrical faults occur quickly, and it takes a great deal of experience and time to detect them manually. The Bender ISOMETER® is the core of reliable technologies for the safe handling of electrical power for high availability. It interacts with fault localisation devices (EDS) or residual current monitoring systems (RCMS) to continuously monitor the electrical systems on board. RCMS are used to monitor earthed systems (TN and TT systems) for fault currents or residual currents. Residual current monitors detect deterioration of the insulation level early and reliably. Insulation monitoring devices permanently monitor the insulation resistance of unearthed systems and alarm when the value falls below a response value. Insulation fault locators are used in unearthed power supplies. They use measuring current transformers to detect the test current signals generated by the insulation monitoring device and evaluate them accordingly.

www.bender.de

## besecke GmbH & Co KG

### Hall B6, Stand 625

Bremen-based besecke GmbH & Co KG specialises in automation and system technologies. The company focuses on the engineering design of the overall electrotechnical system. besecke supports customers with design integrative modules from planning to commissioning and in some areas, the development of individual product applications is an option.
At SMM 2022, besecke will present its latest "AllViu 4" generation as a platform application. With the scalable visualisation adapted to operators' needs, all relevant systems such as monitoring, energy and power management, safety, security and the alarm and control system are visible at a glance. Another product novelty developed by besecke is „MarESiS". The aim is to offer the option to simulate the behaviour of onboard consumers depending on typical processes and realistic scenarios and thus to determine the energy demand before construction starts. Based on these simulation results, hybrid systems with different generators and battery storage can be optimally designed and dimensioned. Worldwide, besecke offers its customers complete solutions from a single source and projects these on site with its own personnel.

www.besecke.de

## Bio-Sea by Bio-UV Group

### Hall A1, Stand 124

The French UV water treatment pioneer Bio-UV Group will be exhibiting a pair of Bio-Sea ballast water treatment systems (BWTS) at this year's SMM. For the first time, the company will be showcasing its new 'M'-Series Bio-Sea unit alongside the company's low-flow Bio-Sea 'L' series. All Bio Sea units incorporate Bio UV Group's next generation UV-C lamp technology, developed in response to market demand for a BWTS with reduced operational costs, a small footprint and simplified maintenance and installation.
For instance, the low-energy-consumption UV-reactor in the Bio-Sea 'L' Series is based around a completely new type-approved 6-kW UV lamp arrangement. The system is sized to guarantee full IMO and USCG compliance, treating flow rates of between 13m³/h and 120m³/h from one the most compact, low energy consuming BWTS on the market. However, the UV technology has been applied across the range of Bio-Sea systems developed for flow rates between <100m³ /h to >2,000m³/h".
In addition, Bio-UV Group provides customers with full turnkey solutions, offering everything from front end engineering and design, 3D-scanning through to pre-installation pipework, installation, commissioning and through-life service and maintenance. www.ballast-water-treatment.com

Source: BIO-SEA by BIO-UV Group

Bio-Sea's BWTS disinfects water and eliminates all microorganisms

## Marine Glazing Brombach + Gess GmbH & Co KG

### Hall B5, Stand 310

The loggia-cabin window system
Source: Marine Glazing Brombach + Gess GmbH & Co KG

Marine Glazing Brombach + Gess is specialised in glass bonding for the shipbuilding industry. During SMM, the company presents its wide portfolio of glazing solutions – including a loggia-cabin window system. Through intelligent use of space, this system provides more comfort and privacy in passenger cabins than conventional balcony cabins, in which the outdoor area can only be used in appropriate weather conditions. The new cabin type is delineated by a vertically sectioned panoramic glass front. The upper pane can be lowered in front of the fixed pane and, together with the movable handrail, forms a glazed balustrade. When closed, the two panes form a room-height, sealed glass facade. This concept ensures absolute weather resistance.
Another turnkey product is the Balustrade-Move System, which is used where flexible design is required to transform particularly windy places into cozy corners – such as for outdoor restaurant patios or sun deck areas, The system can either be a new installation or upgrade existing balustrades. The movable pane is extended by lightly pressing onto the edge of the glass which transforms the railing into a windbreak. Lowering the movable pane is possible in a similar way. www.brombach-gess.com

## Bureau Veritas SA

### Hall B3.EG, Stand 103

Classification society Bureau Veritas M&O (BV) is driven by its commitment to shape a better maritime world for future generations. The company is at the forefront of the energy transition, working with the industry to develop clean energy concepts, from low- and zero-carbon fuels to alternative propulsion systems for both newbuilds and in-service vessels. With its expertise and independent position, BV is in a unique position to ensure safety and validate performance, building the trust needed by all maritime stakeholders in the transition towards sustainability.

At SMM, the companies' experts will discuss how classification societies, the industry and technology providers can drive the development of the new fuels that are needed to decarbonise shipping, and how collaboration and independent validation will be key in the coming years, as several technologies and fuel options are likely to coexist. BV's experience with LNG has provided a blueprint for safe improvements with new fuels – demonstrating how class can support early designs, manage change, and work collaboratively with shipyards, tech providers and shipowners on future alternatives.

BV understands the challenges the industry faces, and is supporting stakeholders with practical advice, tools, and technology to run safe, sustainable, and high performing businesses. www.bureauveritas.de

BV's experts at work Source: Bureau Veritas S.A.

## Cassens & Plath GmbH

### Hall B6, Stand 326

At Cassens & Plath, traditional seafaring meets the latest high-tech experience and scientific knowledge.

At this year's SMM, the company will showcase various compasses and sextants as well as the latest nautical precision instrument, developed and built in Bremerhaven: the BETA/125 spherical compass. With a card diameter of 125mm, the compass is close to being approved as a MED/4.1 Class A/A2 compass and can thus be used for worldwide navigation.

These precision instruments are crafted, adjusted and tested in Germany.

The company's high quality standards result in products that sailors and captains all over the world rely on, and whenever needed, Cassens & Plath can respond to individual customer requirements.

www.cassens-plath.de

## Canada's Ocean Technologies

### Hall B6, Stand 141

At the SMM booth of Canada's marine technologies, the spotlight will be set on cross-border knowledge transfer and networking. With the largest Arctic Ocean territory and the longest coastline in the world, ocean technologies are an important driver of Canada's economy. Visitors will meet the delegation of Canadian companies and several key stakeholders from Canada's ocean tech sector at the trade show. Moreover, they are invited to attend the following events:

On Tuesday, September 6th at 6:00 pm, a harbour cruise will take off – hosted by the Province of British Columbia. Wednesday, September 7th will be the day for Canada's innovative marine capabilities presentation. In Room "Kopenhagen 2", at 10:00 am, British Columbia Ferry Services Inc (BC Ferries) will present its plans for the construction of the companies' Major Class ferries to be built within the next decade. In addition, there will be presentations from seven Canadian companies on their products and services. In the afternoon of Wednesday, September 7th, from 4:00 – 6:00 pm, a Canada Reception will be held – giving visitors the opportunity to deepen and extend their knowledge and to develop new project ideas. www.international.gc.ca

## CODie software products e.K.

Hall B6, Stand 420

CODie supports companies in the maritime business and the maritime supply chain in initiating and implementing future-oriented technologies and processes. At SMM, the company highlights its youngest product. The new mmc (maritime-management-centre) – a modern digital assistant that automates routine tasks, streamlines operations, and supports everyone involved in ship operation and management. mmc is an all-round ship and fleet management system. It covers all working areas in the day-to-day ship operation like planned maintenance systems (PMS), asset management and ship stores, procurement and purchasing, crew management and payroll, document control (ISM, TMSA), fleet reporting and performance monitoring, ship inspection and survey, dry-docking, claims management, and newbuilding supervision. The shore system uses the cloud and can either be operated in-house or online. Each ship has an autonomous system on board, ensuring that the fleet is always fully operational, even when offline. An intelligent, self-optimising data transmission ensures that data are available, where they are needed, without user interaction. Modern, future-proof development systems and database concepts ensure that processes and procedures can be streamlined and optimised over the long term. A team of software and shipping experts supports customers in software implementation and operation.

www.codie.com


View of the mmc Dashboard

Source: CODie software products e.K.

## Danelec Marine AS

Hall B6, Stand 525

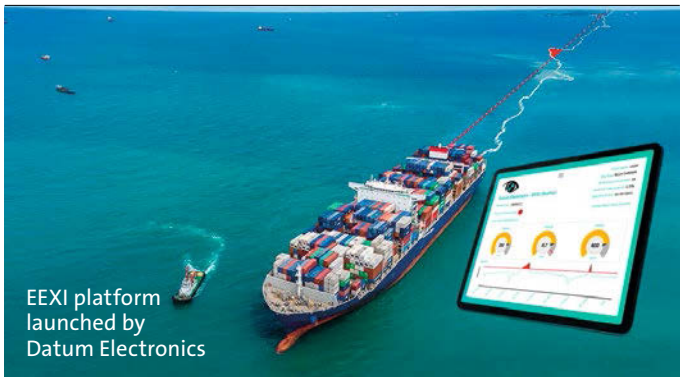
Danelec Marine is one of the leading manufacturers of voyage data recorders (VDR), electronic chart display and information systems (ECDIS) and ship-to-shore data systems, with more than 6,000 installations worldwide. The company will launch new and updated products at SMM 2022 including a new version of its DM100 VDR. New developments in maritime IoT include an expanded secure data transfer system that connects to Danelec and third-party VDRs as well as directly to equipment performance monitoring systems to accommodate the most modern vessels with high focus on maritime IoT. DanelecConnect, the company's application agnostic digital platform continues to be in the spotlight with new account management and subscription applications.

www.danelec-marine.com


The voyage data recorder product family

Source: Danelec Marine AS

Source: Datum Electronics



EEXI platform launched by Datum Electronics

## Datum Electronics

Hall B1.OG, Stand 332

UK-based Datum Electronics develops, produces and sells torque and shaft power measurement applications. At SMM, the company showcases its new shaft power limitation (SHaPoLi) system to control greenhouse gas emissions – providing the necessary features and functionality to comply with the regulations MARPOL Annex VI, MEPC.335(76) and the Energy Efficiency Existing Ship Index (EEXI). This new system offers dynamic shaft power measurement data from its well-established SPM application that automatically produces voyage reports in support of the regulatory port authority documentation requirements. This provides an easy and convenient way to evidence and ensure EEXI compliance. The new system is being delivered just at the right time when vessel owners are having to work hard to meet EEXI regulations and switch to a new way of referencing power exceedance. This module will not only provide real-time logs for adhering to legislation but also provide valuable data that vessel owners can use to improve operations and achieve fuel savings and efficiencies across multiple vessel types for years to come. The module will work in conjunction with other Datum condition-based monitoring products such as Datum Hawk, which provides condition-based monitoring of engines using digital twin analysis and dynamic torque measurements against baselines.

www.datum-electronics.com

## Deutsches Maritimes Zentrum e.V.

Hall A3, Stand 100

The German Maritime Centre (DMZ) is a Hamburg-based independent institution, whose work covers entire value chains in the fields of shipbuilding and marine technology, shipping, as well as ports and maritime logistics. The organisation draws on the maritime sector's innovative capacity and on topics of the future such as fossil-free, emissions-free propulsion systems, autonomous shipping, and recruiting young talents. At SMM, the association will outline initiatives and projects, like technological change, sustainability and climate change, competitiveness, demographic change and young talents. In addition, DMZ presents the Maritime Map and the Maritime EU Funding Compass. Each day at 10:30 am, the institution invites delegates to a Brown Bag Breakfast and a keynote presentation, held by branch experts in German language. In the afternoon at 02.00 pm, there will be further discussions with guests from the maritime industry.

www.dmz-maritim.de

## d-i davit international-hische GmbH

Hall B5, Stand 223

Aerial view of the d-i davit international-hische company site
Source: d-i davit international-hische GmbH

d-i davit international-hische GmbH is a German supplier of deck equipment, such as tailor-made davit systems and cranes. Rather than off-the-shelf items, the company specialises on customised systems including those for offshore, navy, mega-yachts, and arctic temperatures down to -52°C. At SMM, the supplier informs about its new staff member qualification: FROSIO Inspector Level III for Surface Coating. FROSIO is an advisory board from Norway that has been responsible for the certification of coating inspectors since 1986. The FROSIO certificate is recognised worldwide. Among other things, FROSIO inspectors monitor the entire corrosion protection process. They are responsible for the planning, the implementation, and the acceptance of all protective coatings.
In addition, the company highlights its successful implementation and use of the whole branch of digital applications to master the last pandemic years. In this changed work set-up and with new skills, two big shipyards in Northern Europe awarded substantial cruise liner orders to d-i davit. This provides a welcome boost for mid- and long-term business for all involved industry branches.

www.di-hische.de

## DNV

Hall B4.EG, Stand 221

At this year's SMM, the classification society DNV will welcome customers, partners, and stakeholders as the main sponsor of this leading maritime trade fair. On September 6th, DNV will launch its latest Maritime Forecast to 2050, which is part of the Energy Transition Outlook (ETO) series of reports. The publication is a powerful tool to turn strategic uncertainty into confident decision-making. It will help shipowners address the dual challenge of increasingly stringent climate change targets and regulations, while facing the uncertainty over future fuel choices at the same time. At the Maritime Forecast to 2050 launch event, a line-up of experts from the industry and DNV will discuss the report's findings. They will tackle critical issues such as the evolution of the fuel mix, the most efficient and cost-effective ship designs and the potential impact of policy interventions including green corridors.
Besides, DNV will offer expert insights and advice on how to capitalise on its broad digital service offerings to keep the global fleet running with confidence. This will enable its customers to take a strategic approach to their fleet management, managing compliance obligations in a straightforward way, as well as empowering crews with easy-to-use digital tools which they can access at any time.
Furthermore, visitors will be able to meet DNV's global DATE experts who are supporting day-to-day operations and are helping to resolve crises. They will be on site to share their knowledge and experience gained from working with more than 10,000 ships around the world. Cyber security also plays an increasingly important part of DNV's risk approach. Also on September 6th, DNV will invite representatives of maritime and offshore system suppliers and yards to a cyber security seminar focused on digital developments, while also giving an outlook on increasingly automated and connected vessels and systems.

www.dnv.com

## DVV Media Group GmbH

Hall A1, Stand 529

At the joint stand of Schiff&Hafen, Ship&Offshore and Täglicher Hafenbericht (THB), the Hamburg-based publishing group DVV Media Group will again present its sophisticated portfolio of maritime publications, online media and events.


Source: Evers/Schiff&Hafen

Information and networking at booth A1/529

For more than 70 years, the German magazine Schiff&Hafen has offered reliable content focusing on shipbuilding technology, shipping, and offshore and marine technology. Its international sister publication Ship&Offshore reports in English language on global developments in the shipbuilding and offshore sectors. A large number of thematic and regional special publications round off the portfolio.
Digital newsletters, video formats and webinars are also part of DVV Media's maritime product range.
At the established conferences "Maritime 4.0" and "LNG & Future Fuels Forum", forward-looking developments from the fields of digitalisation and alternative propulsion systems are presented and discussed.
During SMM, DVV Media publishes the daily trade fair newspaper SMM Daily News and produces the Daily View video series. A highlight is the daily press lunch at the booth. On each day of the fair, the editors of Schiff&Hafen and Ship&Offshore will be available from 12:30-13:30 for a chat. Drinks and finger food will be served.

www.schiffundhafen.de
www.shipandoffshore.net
www.thb.info

## eCap Marine GmbH

### Hall A3, Stand 317

eCap Marine GmbH develops and manufactures mobile, containerised power generation applications for supplying sustainable power to ships at berth and at sea. At SMM, the company showcases the eCap EPS (Electric Power System) – including all eCap Marine's semi-/mobile and emission-reduction or emission-free power generation technologies. According to specific application scenarios, and requests and specifications from clients, each EPS can be customised and configured for using a variant of propulsion systems and alternative fuels.

Compact and movable power generation systems guarantee stable, decentralised off-grid power supply. Applications include shore power supply or APU facilities in ports as well as silent and emission-free power supply for construction sites, remote areas, festivals, and so on. Compared with other systems, the compact eCap EPS has a small environmental footprint while all key and required components are integrated. Hence, apart from land-based applications, eCap EPS is advantageous for installation on board vessels, as a battery system, hydrogen setup, or hybrid-drive, either for retrofits or for newbuilds.

www.ecap-marine.com


Source: eCap Marine GmbH

The mobile emission-free power generator H2PowerPac with H2 tank on a 20' trailer


Illustration of the EMHA exhibition stand
Source: EMHA GmbH

## EMHA GmbH

### Hall B7, Stand 726

Epoxy resins and services for use in shipbuilding and industry are the core of Marine- und Industrie-Montage GmbH's (MIM) product portfolio. The company is using SMM to present an expanded range of services to trade show visitors – resulting from the acquisition of MIM by the Dutch EMHA Group. Both companies have been working together for a long time and the associated services have finally become one. Based in Norderstedt, Germany, EMHA GmbH will offer the established products Chockfast Orange, Railko, Tenmat and Feroform bearings under its new name – supplemented by expanded services, such as machine alignment and on-site machining. The corporate parent, EMHA BV, is a multidisciplinary engineering and services company that provides a wide range of offers to the marine, offshore and petrochemical industries. EMHA is an established company in the maritime and industrial sectors. It specialises in mechanical engineering, machine alignment, 3D surveys, vibration measurements, and pipe and steel construction.

www.mim-hamburg.de

## Ecochlor

### Hall A1, Stand 327

Ecochlor Inc recently signed a collaborative agreement with Armada Technologies, LLC. As part of the agreement, Ecochlor will provide Armada with technical assistance and global sales and marketing support. In Hamburg, the company will showcase Armada's innovative hull lubrication technology, among other things.

The Armada hull air lubrication system is expected to be available to shipowners by the end of 2022. The system will deliver an estimated fuel saving of 10 - 12% depending on hull design and is effective regardless of fuel type, making it a key technology in transitioning to zero-carbon fuels, Ecochlor said in a statement.

Ecochlor has a long-term strategy of diversification from being solely focused on ballast water management to offering additional green technologies to shipowners through its own internal R&D as well as collaboration and partnerships with other maritime companies. The Armada collaboration further expands the innovative environmental technology offerings to the maritime industry.

www.ecochlor.com

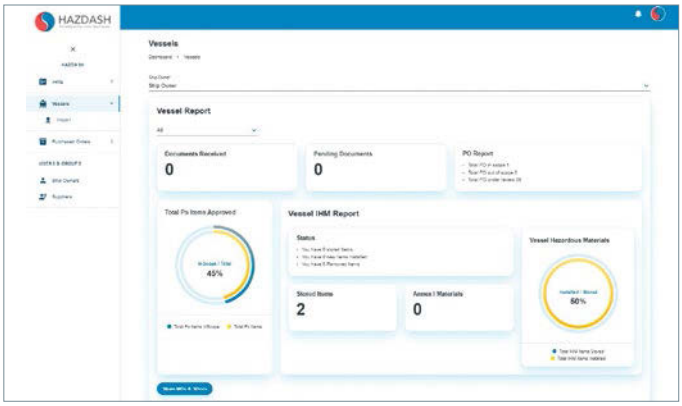
## EPE – Environmental Protection Engineering

Hall A1, Stand 218

Environmental Protection Engineering (EPE), supplier of environmental protection services and products, will present Hazdash – an intelligent cloud-based platform which allows the Inventory of Hazardous Materials (IHM) on board a ship to be kept fully up to date, at SMM.

The new platform, which will be officially launched at the show, ensures regulatory compliance by streamlining the IHM maintenance process for both shipowners and suppliers. With a number of smart features to enhance user experience, and information available in real-time, shipowners can ensure IHM remains up to date at ship and fleet levels while being able to access and download the required documentation easily at anytime, anywhere.

For suppliers, Hazdash removes the burden of uploading documentation for each individual order and prevents unnecessary requests being issued, with relevancy checks carried out by the system's smart filter function. In addition to other features, suppliers can create a product catalogue to ensure all IHM documents are readily available to all stakeholders.




Source: EPE – Environmental Protection Engineering

Screenshot of the Hazdash Dashboard

Apart from Hazdash, EPE will be showcasing several of its technologies including Powerklor, its on-site sodium hypochlorite generator, and the well-established Polcor Anodes. www.epe.gr

## Filtersafe Ltd.

Hall A1, Stand 541


The Filtersafe team will show the new Manta series filters at its booth Source: Filtersafe Ltd.

Filtersafe – one of the world leaders in automatic saltwater filtration specialising in self-cleaning, high-capacity fine-mesh filters – will be showcasing one of its new Manta series filters at SMM, as well as discussing the importance of high-performance filters for effective ballast water management.

Manta maintains Filtersafe's impressive removal rates – 99.6% of organisms over 50 µm – all in a cost-effective package with a small footprint, specifically engineered for a UV ballast water management system (BWMS). Filtersafe has received an equivalent series type approval from DNV and the USCG for the filters. Gaining this approval ensures that customers of the performance-leading BallastSafe filter now have a new, more compact option to add to their BWMS portfolio without the need for additional type approval processes.

A high-performance filter with scalable automatic self-cleaning technology is vital for BWMS operations in challenging water conditions, which is a priority for regulators and ship operators alike. Automatic filter cleaning can be increased when ballasting in sediment-rich waters, such as the Port of Shanghai, to ensure a consistent flow rate and to avoid costly operational issues such as clogging. Among others, Filtersafe's experts will discuss the Manta series and how to overcome BWMS operational challenges.

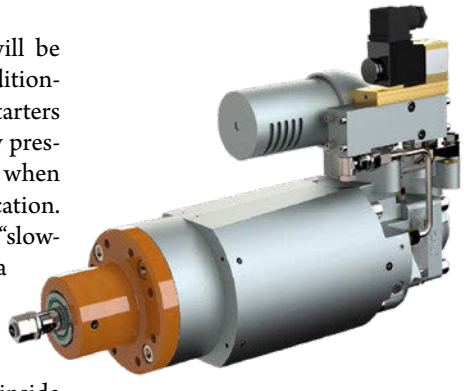
www.filtersafe.net

## Gali Deutschland GmbH

Hall A3, Stand 400

Gali provides complete starting systems and components for combustion engines. The portfolio includes air and hydraulic starters, shut-off valves for emergency stop, turning mechanisms (barring motors), air, hydraulic and nitrogen starting systems. The company specialises in supplying reliable air starters for the highest demanding markets and adverse environments. At SMM, Gali will be presenting its "rotor system" technology which has been developed to assure a reliable starting of the engine even in tough conditions. Being presented in the marine, power generation, industrial, nuclear, mining and locomotives markets, Gali continues to develop new applications to optimise the starting system for combustions engines with state-of-the-art technology.

One of the highlights will be the enlarged range of traditional 30-bar high-pressure starters with the new line for low pressure working up to 10 bar, when required due to the application. Furthermore, the new "slow-turn" system guarantees a safe starting of the engine – preventing engine water stroke due to water or oil leakage inside the cylinder. www.galigrup.com

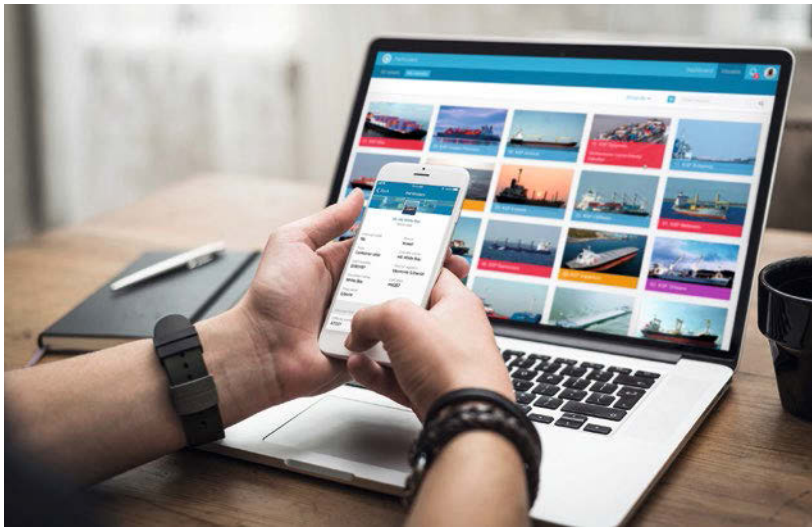


Low-pressure air starter
Source: Gali Deutschland GmbH

## Hanseaticsoft GmbH

Hall B4.EG, Stand 112

Hanseaticsoft GmbH, part of Lloyd's Register's Maritime Performance Services division, drives digital transformation in fleet management. The company's Cloud Fleet Manager (CFM) is a cloud-based all-in-one software package for shipping companies. It will be presented and demonstrated at this year's SMM. The system is web-based and can be used without any installation. It centralises all information by removing data silos and makes insights available for all employees ashore as well as for the crews at sea. The application's cloud-based design allows employees to use it anytime, anywhere, and browser-independently. According to Hanseaticsoft, access to the most important information is secured even on smart phones. Cloud Fleet Manager offers applications that are optimised for all departments of shipping companies and increases collaboration, streamlines processes, and can be used intuitively. With Cloud Fleet Manager, staff can work in interactive teams to simplify crew management or seamlessly share, manage and resolve service requests, for example. From payroll to purchasing, Cloud Fleet Manager promotes higher productivity and economies at fleet rather than vessel level. Whether finding relevant data on vessels, crew members or employees, or scheduling maintenance, all can be done with just a few clicks. Thanks to powerful APIs, it is simple to integrate existing systems. Enhanced reporting and analytics options complement the software.



User interface of the Cloud Fleet Manager Source: Hanseaticsoft GmbH

www.hanseaticsoft.com

## Hasytec Electronics GmbH

Hall B5, Stand 331

Hasytec is specialised in ultrasound technologies to avoid deposits on all liquid carrying surfaces. The company will be presenting its latest ultrasonic antifouling system at SMM: the Dynamic Biofilm Protection Intelligent (DBPI) system received type approval in May 2022. The product prevents marine fouling and biofouling on all liquid-bearing surfaces. The whole system consists of a modular control box and transducers. These are attached by using a two-component glue, which keeps the installation effort as low as possible. After commissioning, the system starts working automatically. The transducers permanently analyse factors such as ambient temperatures or fill levels. If the system detects deviations from the determined values, an adjustment is made automatically. The sound waves generated dissolve the cell envelopes of the protozoa, preventing them from adhering and forming biofilms. Biofouling enhances the resistance of vessels and leads to a reduction in the cooling capacity. Operating costs increase due to higher fuel consumption. In addition, costs are incurred for maintenance and cleaning. By avoiding biofilms, expenses can be reduced, and operational safety can be increased. The use of Hasytec ultrasonic antifouling is a sustainable application that eliminates the need for copper anodes or paints containing heavy metals.

www.hasytec.com

## HEMEXPO – Hellenic Marine Equipment Manufacturers & Exporters

Hall B7, Stand 222

Hellenic Marine Equipment Manufacturers and Exporters (HEMEXPO) – a suppliers and exporters association for the shipping sector, represents Greek marine equipment manufacturers and maritime technology specialists worldwide. Visitors to SMM will have the opportunity to meet HEMEXPO and several of the association's members including D. Koronakis, Elvik, Emmis, Epe, Erma First, Farad, Marinetraffic, Prisma Electronics, Psyctotherm, Seabright, SQlearn, Uteco and Valadis. HEMEXPO companies will be showcasing a range of technologies, including a series of new smart ship applications and technologies designed to help shipowners and yards meet their goals for greater sustainability, equipment efficiency and digitalisation.

With over 30 members, HEMEXPO brings together Greek companies that manufacture and export a comprehensive range of world class marine equipment services used in the construction, conversion, maintenance and upgrading of ships and other marine structures.

HEMEXPO has close ties with Greek shipowners and shipyards around the world and is a strong advocate of collaboration as a route to finding solutions to the challenges facing the shipping sector. The association is proactive in its approach to developing collaborative partnerships which foster innovation and support research and development.

www.hemexpo.gr

## Hydac

Hall A1, Stand 138

Hydac's key topics at SMM 2020 will be digitalisation, decarbonisation and large engines, and the full range of shipping equipment.

Experts at the stand will inform visitors about how they can increase the service life and reduce the carbon footprint of a ship's engine with optimal conditioning. Innovative hydraulic drive systems which reduce environmental impact, save space and weight, thus making a contribution to the future of the shipping industry, will also be in focus. The products on display will enable owners to save cost and resources.

www.hydac.com

## IMES GmbH

Hall A2, Stand 235

The German IMES GmbH, specialist in cylinder pressure sensors and engine monitoring systems, will present the new generation of its electronic hand-held devices type EPM at SMM in Hamburg.

IMES offers four different EPM types: EPM-Peak, EPM-XP, EPM-XPplus and EPM-XP-plus-vibro.

All EPM devices are battery powered, compact and lightweight hand-held devices for two- and four-stroke diesel engines. According to the company, which celebrated its 25-year anniversary in July, they convince with their ease of use, robustness, and high accuracy. There is no need for factory calibration, not even after several years of operation.

More than 5,000 units have been sold up to now, IMES recently stated.

The measurements that can be performed depend on the used EPM type. The digital peak pressure indicator EPM-Peak is designed to measure the maximum value of cylinder pressure while the engine analyser EPM-XPplus-vibro enables advanced combustion pressure measurements including vibro-acoustic diagnostic on two- and four-stroke diesel engines.

The engine diagnostic device EPM-XPplus with vibro sensor
Source: IMES GmbH

The further development EPM Next Generation offers one common hardware for all EMP types, thus enabling a simple upgrade from peak pressure indicator EPM-Peak up to engine analyser EPM-XPplus-vibro. The user can download a higher version from the Internet and it is not necessary to send the device back to IMES.

The collected data of all EPM types can be displayed and evaluated from the EPM visualisation software. The device is connected to a PC via USB, and the visualisation software identifies the EPM type and activates the corresponding functions. Depending on the instrument, peak pressure, pressure- and combustion behaviour, performance data as well as valve timing will be evaluated and analysed. If the PC is connected to the Internet, automatic checks will show whether there are any hardware or visualisation software updates. The user can install the updates and they are free of charge.

Furthermore, the optimised hand-held devices of the EPM Next Generation offer two additional function keys for an easier handling and a larger and more comprehensive display.

All devices of EPM family are equipped with the robust cylinder pressure sensor HTT-06 that offers a good thermodynamic performance. They all have a battery capacity of more than 20 working hours.

www.imes.de

## Kaeser Kompressoren SE

Hall A3, Stand 114

Kaeser products are used for numerous shipboard compressed air applications, beginning with rotary screw air compressors for nitrogen production on gas and chemical tankers as well as dual-fuelled vessels and extending to SCR, working and control air applications. At SMM, Kaeser gives deep insights into its maritime product and Service Hub Portfolio (SHP). When it comes to compressed air on board a vessel, a reliable supply is one of the most important factors. Kaeser Marine Service ensures help is always available in the event of an issue, as well as for regular service intervals worldwide.


Kaeser Marine service engineer on the job Source: Kaeser Kompressoren

Globally networked and coordinated centrally from the Marine Head Office (MHO) in Coburg, Germany, Kaeser service specialists are available if needed at the next port of call, as soon as the ship has berthed. Kaeser Marine service engineers, service technicians and spare parts can be despatched whenever and wherever they are needed, to guarantee safe operation aboard vessels anywhere in the world.

In order to keep compressors and dryers continuously operating as reliably, effectively and economically as possible, the enterprise offers specially designed products, service kits and service intervals for marine applications and requirements. Kaeser compressors need only four different service kits – A, B, C and D – throughout their whole life cycle. These kits contain such items as filters, cartridges or components, depending on the service required. www.kaeser.com

## Lloyd's Register Group Ltd, Lloyd's Register Marine

Hall B4.EG, Stand 107

Lloyd's Register is an international provider of classification, compliance, and consultancy services to the marine and offshore industries. The company is delighted to be exhibiting at this year's SMM and reconnecting with the marine community – from experts in ship design and engineering to launch and beyond. The maritime energy transition and digital transformation will be this year's focus. As the entire maritime sector moves forward on the decarbonisation journey, one must look to mobilise our readiness for the challenges ahead, working together to recognise the potential that each new and alternative fuel has in contributing to a sustainable future in shipping.

The transition of the industry towards the safe adoption of these new fuels will require a considered approach. The industry needs standardisation, and LR has been driving the industry forward by leveraging the benefits of a prescriptive approach whilst embracing the necessary risk-based approach to manage all the novel challenges the transition presents.

Whilst safety is paramount for the adoption of future fuels, the entire maritime industry must also address technology, investment, and community readiness – factors that are tracked by the LR Decarbonisation Hub's zero-carbon fuel monitor. LR emphasises how important these insights are for shipowners and operators to create safe and sustainable pathways to a zero-carbon future. www.lr.org

LR is committed to the goal of building and operating more efficient ships Source: Lloyd's Register

## Lutz Aufzüge GmbH

Hall B4.EG, Stand 101

Lutz Aufzüge GmbH is one of the world's leading suppliers of ship elevators. The company's range of services includes planning, manufacture, assembly, modernisation and repair of installations – from large container ships to exclusive cruise vessels. During this year's SMM, focus will be on the business division "Marine Elevators Services". Detailed information will be given on maintenance work, regular inspections, modernisations, new building installations, spare parts and repairs of marine elevators.

Furthermore, the exhibitor will introduce the newly founded subsidiary "Lutz Elevators Americas" in Panamá. With this expansion Lutz Aufzüge GmbH underlines the importance of the American market for future business development and strengthens its presence in North, Central and South America. Moreover, trade show visitors will learn that Lutz Elevators Americas will extend the company's comprehensive range of services to include the maintenance of third-party installations.

www.lutz-aufzuege.de

## MAN Energy Solutions SE

Hall A3, Stand 301

Source: MAN Energy Solutions

For the electrolysis of hydrogen, MAN Energy Solutions' daughter company H-Tec Systems offers integrated containers in the MW range

MAN Energy Solutions will concentrate on three main topics at this year's SMM. The first is that of future fuels and decarbonisation. Here, the showcase will include the pioneering role played by the company's subsidiary, MAN Cryo, in systems for storage, distribution and handling of liquefied gases. A highlight will be the green potential of synthetic natural gas, as well as other promising alternative fuels like methanol, ammonia and hydrogen.

Referring to hydrogen, MAN Energy Solutions will introduce the recent significant investment in its daughter company, H-Tec Systems, specialised in hydrogen electrolysis.

The second topic will be the display of new products, including such engines as the dual-fuel engine ME-LGIM, capable of burning methanol, and the versatile, high-speed engine MAN 175D. MAN Energy Solutions will also be revealing the latest addition to its four-stroke portfolio during the trade fair – a dual-fuel, medium-speed type. Another focus will be set on LNG propulsion systems – including advances on methane slip – and looking at propeller and aft-ship arrangements.

Finally, the company will highlight operations and digitalisation, covering software as a service – including PrimeServ Assist, its digital, remote service – along with two- and four-stroke retrofits, and the Omnicare third-party service concept.

www.man-es.com

## Martechnic GmbH

Hall A1, Stand 432

Martechnic GmbH develops technical applications for the effective and safe operation of various engine types. During SMM, the company will present its condition-monitoring systems for fuel, lube and hydraulic oil. The products include portable measuring devices and test kits as well as intelligent sensor technology. In addition, the family-owned company offers products for sampling equipment with tamper-proof technology for obtaining representative oil samples, as well as environmentally friendly ultrasonic cleaning systems.

With regard to decarbonisation of international maritime shipping, Martechnic's oil analysis equipment can be used as an aid during the testing of alternative fuels (for example, ammonia, methanol, hydrogen, synthetic gas). Regular or continuous on-site oil tests allow timely detection of changes in oil condition or deviations from on-specification requirements. This enables a safe transition to eco-friendly shipping, allowing effective management when using non-carbon fuel options for dual-fuel engines.

www.martechnic.com

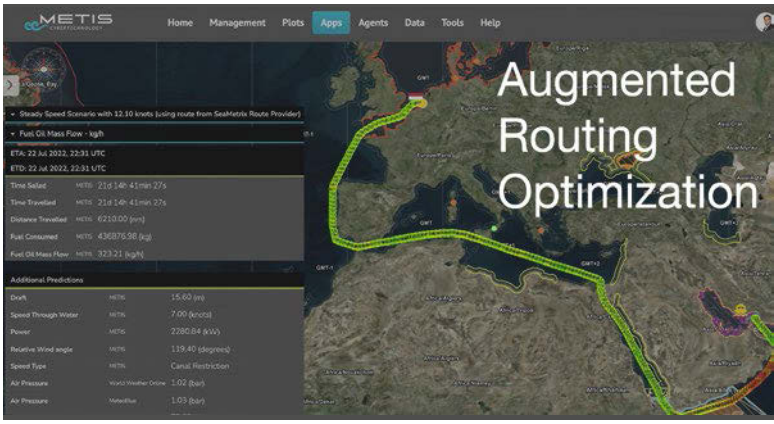
## METIS Cyberspace Technology

Hall A1, Stand 218

Launching at SMM 2022, METIS Cyberspace Technology's Augmented Routing Optimization seamlessly integrates weather-routing functionality from specialised providers into the cloud-based METIS analytics platform. Already optimising vessel performance for fuel consumption, hull fouling, emissions and more, the METIS platform can now consider all variables affecting a ship using a single interface. This represents a significant step forward in voyage optimisation, allowing precise comparisons and setting new data-driven standards to enhance ship safety, efficiency and sustainability.

While the International Maritime Organization and International Association of Marine Underwriters work with the assumption that weather routing helps ships save over 3% in fuel consumption, Augmented Routing Optimization is already proving far more productive, METIS noted. In a six-month pilot, a METIS customer using the system achieved a 923-tonne reduction in fuel oil consumption, equivalent to around USD 750,000 at current prices. This was despite the distance travelled by the ship increasing by 25%. The CII was also calculated as 19.5% lower.

On board a ship, Augmented Routing Optimization enables ship-specific comparisons between the weather-optimised route with other user-defined routes. On shore, managers can take account of route adjustments, calculate and recalculate routes to optimise schedules and better evaluate voyage and post-voyage performance, against expectations or charter party terms.




Augmented Routing Optimization enables ship-specific comparisons between the weather-optimised route with other user-defined routes

Source: METIS Cyberspace

www.metis.tech

## Minimax GmbH

Hall A1, Stand 227

Minimax GmbH will present its latest product range for onboard fire protection at SMM. Technically complex improvements, such as alternative engines to reduce emissions or the storage of electrical energy, pose new challenges on fire protection. From cruise ships to automatic driverless ships, Minimax covers the entire supply chain for fire protection systems and ensures that the units are state-of-the-art and work reliably. Whether fire detection systems, gas, foam, powder, low- and high-pressure water mist fire extinguishing systems for all onboard applications: the company's expert teams work together with the customer to provide the most suitable fire protection systems. This is done in accordance with the safety regulations of the national and international classification societies as well as the SOLAS and IMO recommendations.

Minifog marine XP nozzle

Source: Minimax GmbH

Here Minimax takes over the acceptance of the components as well as the submission of the documentation to the classification societies. The installation of the customised fire protection systems by specialist engineers and the commissioning of the systems on the ship, followed by a thorough inspection, maintenance and servicing are also part of the service offered by the fire protection specialist.

www.minimax.de

## NAPA Oy

Hall B1.OG, Stand 307

Screenshot of the NAPA Fleet Intelligence fleet view Source: NAPA OY

In Hamburg, NAPA, a global provider of software and data analysis for the maritime industry, will showcase how data-powered solutions help design and operate the sustainable ship of the future to maximise efficiency while ensuring safety.

NAPA is spearheading digital twin and cloud-based technology, which it applies throughout the vessel's lifetime, from its design to stability calculations and voyage optimisation. In shipyards, NAPA's 3D model-based integrated design platform supports innovation and optimisation in ship design by facilitating quick iterations, reliable analyses, better collaborations as well as 3D model-based class approvals. At sea, NAPA's product suite uses vessel-specific insights, provided by 3D models and digital twins, taking voyage planning to the next level. Coupled with weather data, NAPA Voyage Optimization calculates optimal routes and speed profiles, enabling captains and operators to minimise emissions for each voyage. Crucially, NAPA's digital applications also ensure the safety of fleets during this green transition. The next-generation NAPA Stability module enables crews to manage stability and loading conditions on board, and its cloud-based platform facilitates real-time information sharing between teams at sea and on shore – supporting a more proactive approach to safety. Concerning bridging design and operational data, NAPA's experts will be available to discuss how it is supporting the industry's decarbonisation by designing the greener future fleet and operating today's vessels safely and sustainably.

www.napa.fi

## Noris Group GmbH

Hall B6, Stand 316

Noris Group GmbH stands for ship automation systems, measurement technology and visualisation "Made in Germany" and the company is using SMM to present its entire product range: from speed sensors, temperature sensors and indicators up to complete packages such as ship automation systems, propulsion control systems and alarm, monitoring, and control systems. The company's products meet the requirements of all major classification societies, such as ABS, BV, DNV, LR, and others.

In shipbuilding, the product portfolio includes propulsion control systems, alarm, monitoring and control systems for engines and gearboxes (IAMCS), power and energy management systems, control systems for pumps, valves, fans and other auxiliary systems, emergency order telegraphs and bridge designs. When it comes to measurement technology and visualisation, the company offers a wide range of sensors for the detection and control of speed, temperature, acceleration, angle of rotation, wireless, etc. Also, analogue indicators in round or square design, different sizes, 360° indicators for rudder angle as well as an individual scale design are part of the Noris Group's product range including measuring transducers, limit value switches and multifunctional devices for signal processing.

www.noris-group.com


Nobistar 4 is a flexible propulsion control system for all propulsion drives Source: Noris Group GmbH

## Nippon Paint Marine Coatings Co, Ltd

Hall B5, Stand 204

Marine coatings specialist Nippon Paint Marine will be showcasing its award-winning Aquaterras antifouling system along with a range of protective coating technologies at SMM.

Aquaterras – a biocide-free self-polishing antifouling coating – is a patent-protected micro-domain self-polishing copolymer antifouling material that is based on a carefully formulated mix of hydrophilic and hydrophobic components. It contains no heavy biocidal pigments, active ingredients or silicone but is proven to reduce ship's drag (frictional resistance) by up to 10%.

The technology has been incorporated into the company's newly launched nano-technology based FASTAR coating, developed to control more precisely the release of active biocides. A FASTAR application can reduce painting times in drydock by up to 37% and fuel consumption by up to 8%, Nippon Paint said.

Nippon Paint Marine representatives will also be on hand to discuss other products in the company's range of marine coatings, including the proven corrosion protection system NOA, and its established A-LF Sea range of fuel-saving SPCs.

www.nipponpaintmarine.com

## Norsepower Oy Ltd

Hall B1.OG, Stand 211

Norsepower, a global provider of auxiliary wind propulsion systems, is demonstrating at SMM how the industry can make crucial progress towards decarbonisation and emissions reduction by harnessing the power of wind. With the potential to be installed on new and existing vessels, Norsepower's Rotor Sails address the industry's mounting pressure to meet and exceed current and upcoming IMO regulations such as EEDI, EEXI and CII.

Demonstrating proven, third-party verified results leading to repeat orders, Norsepower is presenting the success from its recent installation on a second ferry for Scandlines. The company will also outline its agreement with NAPA to offer weather routing and voyage optimisation. This collaborative approach to promote innovation and greater efficiency delivers greater emissions savings and a positive return on investment.

During the trade show, Norsepower's experts will discuss how shipping can achieve decarbonisation and how clean technologies can be combined to maximise efficiency and unlock opportunities to increase cost and emissions savings as well as facilitate a return on investment.

www.norsepower.com


Norsepower Rotor Sails installed on Scandlines' vessel *Copenhagen*

Source: Norsepower Oy Ltd

## Northrop Grumman Sperry Marine BV

Hall B6, Stand 606+615

Sperry Marine, the navigation expert, will use SMM 2022 to unveil the latest in its series of initiatives to deploy digital tools that help vessel operators increase efficiency and lower emissions.

The company will debut two new services designed to improve vessel safety, enhance performance, and lower fuel bills. These include an approach that reinforces navigation safety to deliver improved course-keeping with reduced fuel consumption and a lower workload on the bridge.

In its latest industry collaboration, Sperry Marine will also unveil a new application designed to help vessel owners collect and analyse onboard data, supporting efficient fuel usage and regulatory compliance, while optimising voyage routing.

The new services reinforce Sperry Marine's heritage of developing and deploying digital, networked navigation and voyage support that enable the maritime industry to safely embrace digital tools that enhance efficiency and improve environmental performance.

www.sperrymarine.com

## OneOcean Group Limited

### Hall B6, Stand 503

At this year's SMM, OneOcean presents its new API Services to empower companies' own systems with OneOcean data. The API solutions give access to previously out-of-reach data, for valuable insights and more informed decision-making.
The OneOcean navigation and environmental data solutions allow clients to tailor the content, frequency, location, and origin of data to embed into own existing systems.
With increasing pressure to reduce emissions and minimise impact on the marine environment – coupled with more regulations and reporting requirements – environmental risk management is a top priority for fleet owners and operators. OneOcean's environmental products are developed to provide real-time data and clarity to fulfil requirements and make it easy for ship and shoreside teams to achieve fleet-wide environmental excellence.
For discovering how greater data capability can streamline compliance by simplifying operational processes, reducing risk, and providing valuable oversight, Nicholas Bourque gives a speech on the Digital Transition Stage at SMM on Wednesday, starting at 10:30 am.

www.oneocean.com

## Oswald Elektromotoren GmbH

### Hall B6, Stand B6.124

Oswald Elektromotoren GmbH develops and manufactures customer-specific electric motors from 10 to 3,000 kW and 100 to 600,000 Nm for demanding tasks in industry, shipping, energy and automotive. In many cases, the drives of the family-owned company, now in its fourth generation, replace conventional geared motors, hydraulic drives and internal combustion engines.
At Smm, Oswald will showcase a customised permanent magnet high-torque engine which can be used to power cargo ships and tankers for inland and seagoing shipping. They receive their approvals from classification societies according to shipyard requirements. As alternative systems, Oswald provides PM motors for PTI/PTO applications as well as for thrusters. PM generators for the energy supply aboard vessels with speed-controlled gensets are also new on offer from the company. In 2017, Oswald Elektromotoren GmbH was awarded the "German Environmental Award". The company uses SMM 2022 as a suitable framework for the forward-looking exchange of experience.

www.oswald.de



## Reintjes GmbH

### Hall A4, Stand 211

With a new flexible hybrid system, Reintjes GmbH presents a resilient propulsion system at the stand that combines two different power sources: an electric motor and a combustion engine (diesel, dual-fuel or gas engine).
In the low load range, purely electric operation is possible; in the normal range it is achieved by means of the combustion engine; and in the upper load range, in a head wind or sea,for example, the electric motor can be switched on as an additional booster. When operating the combustion engine, the electric motor can also be used as a generator and use the excess energy to charge an installed battery pack. The system is suitable for installation in newbuild ships and as a retrofit to existing vessels.
Reintjes is a one-stop shop for engineering, hardware, installation and service. The hardware scope of supply includes the gearbox, the electric motor/generator, the coupling between the electric motor and the gearbox, the frequency converter for controlling the electric motor, and a drive control and monitoring system.
The combination of electric motors and combustion engines in the drive train enables an efficient propulsion arrangement across the entire power range. At low speed only the electric motor drives the ship smoothly and quiet. A combustion engine with a lower power output can be selected, as the upper load range can be supplied by simultaneous operation of both propulsion systems. This makes operation more efficient and thus more fuel-efficient than conventional drive systems with only one combustion engine and reduces the release of $CO_2$ emissions.

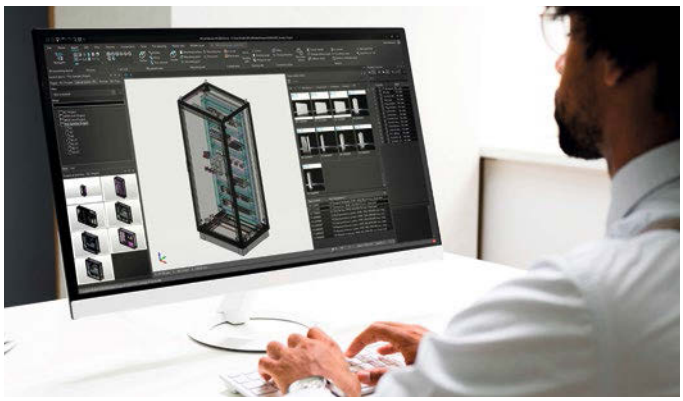
www.reintjes-gears.com

## Rittal GmbH & Co KG

Hall B6, Stand 319

Digital transformation is one of the major challenges facing the shipping industry. According to the motto "data consistency from planning to operation", the companies Rittal and Eplan will be presenting new technologies for the maritime industry at this year's SMM in Hamburg. Eplan is specialised in digital engineering processes. The expert's offering to the maritime industry is the option of designing and displaying the complete ship operating technology within a data-based system landscape. This applies to the areas of process engineering, air conditioning/ventilation, pneumatics and hydraulics, and electrical engineering. Through the Eplan platform, complete, functional digital twins of a specific component right up to the entire ship can be created.

Source: Rittal GmbH & Co KG



Functional engineering with the Eplan Platform 2023 includes electrical planning with panel building and switchgear engineering as well as process engineering and air conditioning/ventilation

Rittal, a provider of enclosures and IT infrastructure, presents the enclosure platforms VX25 and AX, as well as its system for power distribution, VX25 Ri4Power. It also showcases resistant outdoor enclosures that are used, for example, for onshore power applications. Its portfolio for IT infrastructures ranges from IT racks and IT cooling to power distribution and monitoring. Rittal, therefore, demonstrates how significant increases in efficiency can be achieved in production and operation based on standardised platforms.

www.rittal.com

## Rolls-Royce Solutions GmbH

Hall A3, Stand 307

Under the claim 'Pioneering the journey to net zero' Rolls-Royce presents new mtu marine applications for propulsion, automation and service at SMM in Hamburg. The company's experts will take visitors on a journey toward climate neutrality – from diesel engines with exhaust gas aftertreatment and gas engines to their use with sustainable fuels and hybrid systems to methanol engines and fuel cell systems. In line with its strategy of being the innovation leader in the marine industry and providing customers with complete propulsion and control systems from bridge to propeller, Rolls-Royce will also be exhibiting its new range of mtu NautIQ marine automation products.

As part of its 'Net Zero at Power Systems' sustainability programme, Rolls-Royce announced in 2021 that it would realign its product portfolio so that by 2030, sustainable fuels and new mtu technologies can achieve greenhouse gas emissions reduction of 35% compared with 2019. In the meantime, the company is already working on methanol engines and fuel cell systems for marine applications and is developing electrolysers to produce green hydrogen. According to a clear roadmap, marine diesel propulsion systems will gradually be approved for EN15940 sustainable fuels, such as hydrogenated vegetable oil, from the fourth quarter of 2022.

www.mtu-solutions.com

## Schwarze-Robitec GmbH

Hall B2.EG, Stand 324

Schwarze-Robitec is one of the leading international experts in the sector of tube cold bending machines. At this year's SMM, the company is presenting its precise tube and pipe bending technology. On board ships and drilling rigs, many kilometres of pipelines transport fuel, water, oils, gases, and hydraulic liquids, sometimes under high pressure. The Schwarze-Robitec Heavy Duty machine series is particularly suitable for continuous operation under a high level of stress – a typical requirement in the maritime industry. The machines can generate enormous bending force.

Even particularly small tube and pipe radii of up to 1xD can be bent with high precision, the company said. Considering the increasingly limited amount of space available on board, less space required for tube and pipe systems creates more room for larger loading volumes. Due to a range of smart features, the set-up times for the machines are up to 70% faster than with conventional tube and pipe bending machines.

Heavy Duty tube and pipe bending machine CNC 220 HD with multi-stack bending tool

Source: Schwarze-Robitec GmbH

The experts of Schwarze-Robitec will be available at the stand to demonstrate numerous configuration options and to discuss ideal tube and pipe processing conditions to ensure the best results for each specific application.

www.schwarze-robitec.com

## Schiffbautechnische Gesellschaft e.V.

Hall B4.EG, Stand 209

The German Society for Maritime Technology, Schiffbautechnische Gesellschaft (STG), offers a pool of highly qualified members for everyone interested in ship technology and shipping. Under the heading "Shaping the progress of naval technology", STG presents its powerful network and knowledge platform of maritime technology during SMM. The core of STG is the technical, scientific, and economic progress in ship technology and ship operation. This is achieved through comprehensive support of practice-oriented research projects. As a central point of contact for the transfer of knowledge and experience in all maritime fields, STG makes a decisive contribution to the competitiveness of the industry.

In 17 specialist committees, experts from research and businesses are involved in various areas of ship technology. Here, teams from shipping companies, shipyards, companies in the supply industry, universities and research institutes work together on complex tasks on current technical, economic and ecological topics.

In interdisciplinary conferences, STG members share their specialist knowledge and expertise and develop compatible solutions. In doing so, STG sees itself as a capable component of the maritime industry in Germany, providing suggestions for innovations and relevant developments.

www.ship-efficiency.org

## Survitec Group Limited

Hall B5, Stand 528

Survitec, a specialist in safety and survival technology, will be showcasing Seahaven, one of the world's largest advanced evacuation systems at SMM. Having received Lloyd's Register type approval earlier this year, Survitec is set to revolutionise the way shipowners, designers and builders meet SOLAS requirements for the safe and rapid evacuation of passenger ships. This year, Survitec announced that it is teaming up with Norwegian Cruise Line Holdings Ltd to work on a cruise ship design incorporating Seahaven as the primary means of evacuation for the cruise line's Prima class of ships.

Survitec's evacuation system Seahaven protects lives at sea
Source: Survitec Group Limited

The 1,060-person-capacity Seahaven, a self-propelled inflatable lifeboat, marks a significant step forward in the maritime business, the company stated.

Typically, a 4,000-passenger-capacity cruise ship requires at least twelve to 16 lifeboats and up to four marine evacuation systems with liferafts, taking about 30 minutes to evacuate the ship. Just four Seahavens would be required to evacuate the same number of passengers in the same amount of time, freeing up to an additional 85% of existing lifeboat deck space for greater passenger experiences. Visitors will also be able to learn more about Survitec fire safety applications for vessels operating and transporting alternative marine fuels together with a portfolio of life-saving appliances and wearables.

www.survitecgroup.com

## Tecklenborg, Kegel GmbH

Hall A1, Stand 100

Tecklenborg, Kegel GmbH is a rigging company with locations in Bremerhaven and Wismar. The company is among the leading European importers and exporters of stainless-steel ropes. At SMM, the enterprise will give deeper insights into the assembly and testing of steel wire ropes as well as non-destructive steel rope testing – using the magnetic induction method for guy ropes, tow ropes and zip lines.

For this purpose, a 700-tonne proof load machine was put into operation this year. With its dimensions of 40.5 x 3.5m, a total testing length of more than 30m and a stroke of 4.5m, it can test all types of wire and fibre ropes, chains, shackles, and other lifting gear to EN 12385 and EN 2307, non-destructive as well as destructive. Fatigue tests with up to 100,000 load cycles are also possible and are documented according to the latest criteria. Bridge cranes over the entire test bench make it easy to bring in particularly bulky test objects.

www.tecklenborg-kegel.de

## Tamsen Maritim GmbH

Hall B4.EG, Stand 311

Tamsen Maritim GmbH from Rostock is one of the long-standing exhibitors at SMM, demonstrating high-tech engineering in special ship construction. In recent years, the company has mainly presented itself as a multifunctional repair yard for small- and medium-sized government, research and special ships as well as for units of the German Navy.

At this year's exhibition, Tamsen Maritim GmbH will be presenting itself as a modern newbuilding shipyard with special ship projects developed in-house. They include a 23m-long patrol boat specially designed for shallow waters with an aluminium hull and a draught of just 1.2m. Two vessels of this type are currently being built at the shipyard on the Baltic Sea on behalf of the German General Customs Directorate. They will be deployed in the Wadden Sea in the future.

For the first time, Tamsen Maritim succeeded in winning two naval newbuilding orders with its 20m-long STS (safety, transport, towing) vessel specially designed for the German Navy.

www.tamsen-maritim.de

The STS vessel was developed in-house
Source: Tamsen Maritim GmbH

## TGE Marine Gas Engineering GmbH

### Hall A4, Stand 235

TGE Marine is one of the leading liquefied gas systems' providers, specialising in the design and engineering of cargo handling systems and tanks for any type of liquefied gas carriers, bunker ships and floating storage and gegasification units (FSRUs). At SMM, the company highlights four of its core competences.

With its track record as a pioneer in the development of LNG fuel gas systems, including systems for all major engine makers and types of engines (two-stroke, four-stroke, high/low pressure), the company claims to be the most experienced independent provider of fuel gas systems worldwide. Having equipped more than 250 gas tankers, TGE demonstrates its capabilities to supply cargo handling systems and cargo tanks for LPG and ethylene gas carriers.

Furthermore, TGE Marine has a proven track record for small LNG carriers, shuttle tankers, and bunker vessels of 5-30,000m$^3$ capacity. Its supply includes cargo tanks and complete gas-handling systems for LNG carriers and bunker vessels of up to 40,000m$^3$ capacity. The company's floating LNG storage systems are developed for midsize energy centres and remote gas consumers. They can be used for monetising stranded gas from offshore locations on FPSOs and FSRUs. TGE Marine supports its clients and their projects for gas carriers and fuel gas systems from the development throughout the lifetime of the vessel. Project management, excellence in engineering and a strong team of supervisors ensure professional results during the project execution.

www.tge-marine.com

## Thomson Industries, Inc

### Hall A4, Stand 201

Thomson Industries, Inc is specialised in motion control systems and linear motion control. The company will be showcasing its comprehensive line of electric linear actuators for marine applications that help increase productivity and quality, improve safety and ergonomics, and reduce fuel and maintenance costs.

Thomson electric linear actuators, including the Electrak® and Max Jac® product lines, are well-suited for the marine industry due to their compact size, wide range of load capabilities, high efficiency and optional 12-, 24- or 48-VDC operation that allows for automating tasks, and improves efficiency and safety. The actuators provide users with increased flexibility by allowing them to remotely control key aspects of a ship's operation without the complexity, high cost and maintenance associated with hydraulic systems. This capability eliminates the need for periodic maintenance and space-consuming hoses, pumps, filters, and regulators, and improves safety for the operator.

Thomson actuators are tough, resilient, adaptable, and engineered to withstand harsh environments. Other standard features include rugged IP67 (static), IP69K (static) and IP66 (static/dynamic) ratings for superior corrosion resistance and surface treatments that prevent oxidation in salinity environments.

www.thomsonlinear.com

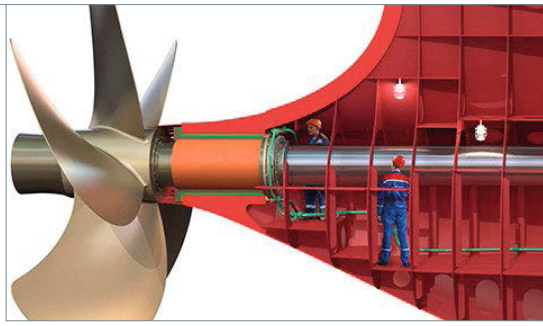
## Thordon Bearings Inc

### Hall A4, Stand 123

Canadian grease-free seals and bearings manufacturer Thordon Bearings will be fielding an executive team of technical experts at this year's SMM to answer questions about the sterntubeless ship, which received ABS type approval in June.

Working in collaboration with Shanghai Merchant Ship Design & Research Institute (SDARI-CSSC), National Technical University of Athens (NTUA) and ABS Global Ships System Center, Thordon Bearings has developed a ship design that removes the need for a sterntube.

According to the research parties, by simply reconfiguring the sterntube space with a shorter shaft and moving the engine further aft significant operational costs can be made, cargo capacity increased and the vessel's environmental footprint greatly improved.

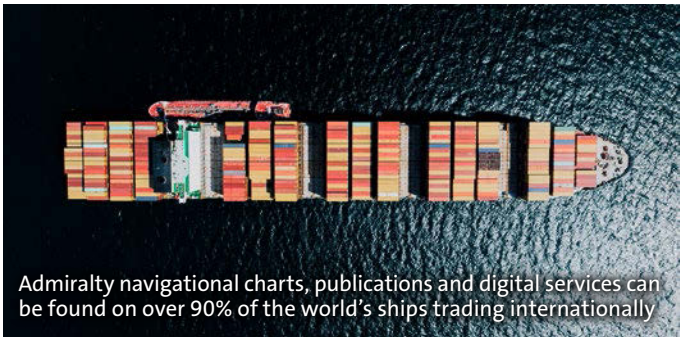


Sterntubeless ship design Source: Thordon Bearings

Thordon's award-winning COMPAC Open Seawater Lubricated Propeller Shaft System, which is integral to the new sterntubeless ship concept, is already in use in more than 500 ships worldwide that operate water-lubricated bearings.

The COMPAC bearing is a proprietary non-metallic polymeric material lubricated by sea water that offers advantages in bearing wear life predictability and reliability. According to the manufacturer, the bearing is also cheaper to maintain and easier to install than oil-lubricated systems. It meets classification society criteria for extended shaft inspections and withdrawals.

www.thordonbearings.com



Source: UK Hydrographic Office

Admiralty navigational charts, publications and digital services can be found on over 90% of the world's ships trading internationally

## UK Hydrographic Office Hall B6, Stand 303

The future of shipping is underpinned by digital innovations, enhanced satellite connectivity at sea, optimised data and new standards, supporting the next generation of navigation. The UK Hydrographic Office (UKHO) aims to be at the forefront of this digital transition, continuing to provide the assured and globally trusted Admiralty Maritime Data Solutions that seafarers depend on. At SMM, UKHO demonstrates that an increasingly digital maritime industry will be shaped by the International Hydrographic Organization's new universal S-100 data standard, enriching future maritime products and services.
S-100 will also enable fleet operations and supply chains to work in closer harmony and unlock a new level of access, transparency and support in near real-time. The new standards will dramatically reduce the time that vessels need to wait for important navigational and safety updates, improving safety at sea and supporting enhanced voyage optimisation and weather avoidance. The UKHO is actively supporting this new era for marine navigation and plays a leading role in advancing the development of the digital standards by working with providers and partners to test product specifications, build the safety case, improve the user experience and realise the potential of the S-100 standard. www.admiralty.co.uk

## VDMA – Marine Equipment and Systems

### Hall A1, Stand 518

"Coffee and MTP" is this year's SMM motto of the industry association VDMA Marine Equipment and Systems. Being part of VDMA, the largest industrial association in Europe, this working group represents the interest of its about 250 member companies. In hall A1, VDMA welcomes its guests at the central stand for personal exchange in a relaxed atmosphere – once again supported by the popular VDMA Barista.
Furthermore, the VDMA will also be offering a varied programme of short presentations at its stand. A special focus will be set on information about the newly published Module Type Package (MTP) integration standard, which is now becoming particularly relevant for European shipbuilding.
In-depth insights to the MTP topic will be given by VDMA at the panel event: "Smart Connectivity by MTP – Improvements for Shipping and Shipbuilding" on the Digital Transition Stage in Hall B6 on September 8th, from 2:30 pm to 3:30 pm.
Last but not least, the online directory german-marine-equipment.de will be available on site. This is a most comprehensive and valuable online tool for the identification of suppliers and partners from the German maritime industry. www.vdma.org


The VDMA invites its visitors to talks and discussions at its booth Source: VDMA

## Wärtsilä Corporation – Wärtsilä Voyage

### Hall B6, Stand 309

Wärtsilä Voyage, the cutting-edge technology provider, will be showcasing its Fleet Optimisation Solution (FOS), its Smart Panoramic Edge Camera System (SPECS), its highly immersive training experience, Smart Realities, and a NACOS Platinum Multifunctional Display at SMM.

Wärtsilä Voyage provides detailed insights into the entire product range
Source: Wärtsilä Voyage

FOS is a holistic data analysis, voyage planning and fleet performance management software package that can help shipowners, managers and operators run their fleets and vessels with optimal safety, efficiency and sustainability.
SPECS is a three-part smart technology system that takes situational awareness to the next level. It spans cameras, augmented reality and data integration. The robust super wide cameras provide a 360° vessel view, eliminating blind spots for better safety.
Smart Realities combines mathematical, physical, and environmental modelling with the latest in virtual and augmented reality to place seafarers on a virtual bridge or engine room to make training as real as it can get.
NACOS Platinum is Wärtsilä's state-of-the-art navigation system that combines navigation, automation, power and propulsion functions into one single system to deliver unequalled flexibility and convenience for seafarers. The Wärtsilä Voyage experts will be on hand to demonstrate and discuss the new product lines.
www.wartsila.com/voyage

## Wärtsilä Corporation – Wärtsilä Marine Power

Hall B6, Stand 309

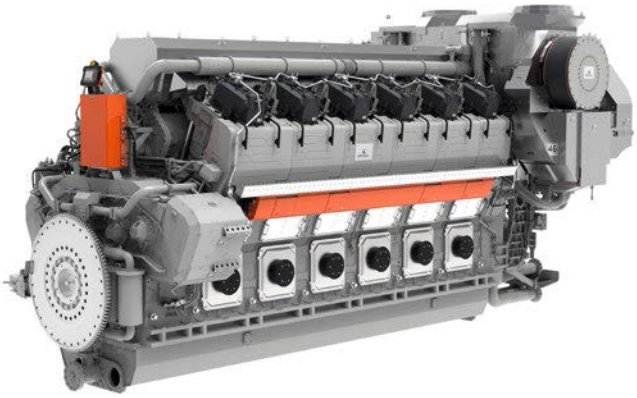
As shipping strives to move away from traditional fossil fuels and reach net zero, Wärtsilä Marine Power is developing and bringing to market technologies and systems that are enabling the maritime industry to meet its decarbonisation goals. Investment in the right retrofits and infrastructure, or building new vessels equipped with tools and technologies that already exist will enable owners and operators to meet and exceed the requirements of the IMO, their customers, and society.

At SMM, Wärtsilä is launching its new Wärtsilä 25 medium-speed four-stroke engine. Designed to operate reliably on a wide range of current and future fuels, it represents a significant breakthrough in the transition to a zero-carbon maritime industry and will provide much-needed operational flexibility for shipowners and operators.

Even as shipping strives to move away from traditional fossil fuels, it is possible to invest in an engine now that will unlock a wider range of options and possibilities for the future.

Wärtsilä Marine Power's experts will discuss how best to manage the decarbonisation transition and how owners can combine the need for new fuels with a system that can be upgraded over time.

Source: Wärtsilä Marine Power



Wärtsilä's 25 medium-speed four-stroke engine

www.wartsila.com/

## WinGD – Winterthur Gas & Diesel Ltd

Hall A3, Stand 108

Swiss marine power company WinGD (Winterthur Gas & Diesel Ltd) will showcase its latest fuel-flexible technologies, including engine advances and energy applications needed to decarbonise the merchant fleet.

The X-DF engine has been enhanced with X-DF2.0 technology, now available in a compact on-engine version for easy installation. X-DF2.0 improves combustion control, minimising fuel consumption and pilot fuel requirements across the engine load range. On top of emissions reductions and including meeting Tier III NOx limits in both gas and diesel mode, the X-DF2.0 has achieved reductions in methane slip of up to 50%. All WinGD's engines, along with those already in service, are retrofittable for ammonia and methanol fuels from 2025.

To drive emissions reductions further and reduce fuel costs, WinGD's X-EL Energy Solutions is a system integration and advisory service for electric and hybrid power arrangements with the two-stroke engine at their core. The whole system is designed, configured, and operated optimally to the vessel's specific requirements. To meet the upcoming EEXI regulations, WinGD has developed a simple, cost-effective software-based power limitation solution that assures compliance within a single port stay.

Source: Winterthur Gas & Diesel Ltd


Intelligent Control by Exhaust Recycling (iCER) is the first technology launched on the X-DF2.0 platform

www.wingd.com

## Wiska Hoppmann GmbH

Hall B6, Stand 212

Wiska Hoppmann is specialised in electrical equipment, lighting products and CCTV video surveillance for trade, industry and shipbuilding. During SMM, the company will highlight several new products. One of them is the new non-metallic LED multipurpose luminaire 4010 with a luminous flux of 1,200 up to 7,200 lumens (lm) and a lifetime of 100,000 hours. In addition to the long standard version measuring 775mm there will be a short 495-mm version available. The high-performance lighting system comes with an option for battery back-up, is corrosion-free and easy to install.

Furthermore, Wiska expands the existing product range with a LED version. With its new casing, it can be used as a searchlight or floodlight and offers 2x18,000 lm. The new product features endless rotation, stepless speed control, home and booster function and can be used within a product range of minus 25°C to plus 45°C.

The Wiska LED Searchlight comes in a new, flexible design

Source: Wiska Hoppmann GmbH

The LED innovations are rounded off by a new high-lumen output version of the floodlight 5000.

In addition, the new CCTV camera series offers a new design. Due to its newly developed pan-tilt unit, this trendsetting camera station can be rotated 360° endlessly. Featuring a compact design with an internal connection compartment and without external cables, the new series replaces the previous stainless-steel range.

www.wiska.com

## Woodward L'Orange GmbH

### Hall A4, Stand 407

Woodward L'Orange GmbH presents a new product range for power-to-X fuels at SMM. The combustion engine industry accelerates the efforts to decarbonise and switch from fossil fuels to alternative fuels produced from renewable sources (P2X), such as hydrogen, methanol and ammonia. There is a broad variety of combustion concepts for these fuels, and the optimum choice strongly depends on the target application. Woodward and Woodward L'Orange are developing a comprehensive portfolio of injection systems for P2X fuels for large engines, ranging from around 100 W/cylinder to over 1,000 kW/cylinder to enable all possible combustion concepts.

The company's new product range of directly solenoid actuated injection systems is tailored to meet market demands that require simpler systems that can be retrofitted.

For methanol, a family of injection systems for Port Fuel Injection (PFI) and Direct Injection (DI) is being developed. The injectors are designed for optimal atomisation of the fuel to allow good mixing and minimise wall wetting.

Injectors for hydrogen are also under development. Like methanol, they can either be used to inject the hydrogen directly (DI) into the combustion chamber or to integrate the injectors close to the intake valves into the intake manifold (PFI).

For gas engines that are adapted to run on gaseous P2X fuels such as hydrogen and ammonia, Woodward's SOGAV gas admission valves are being optimised to withstand the properties of these fuels such as poor lubricity, corrosion behaviour and hydrogen embrittlement.

www.woodward.com/home

Source: Woodward L'Orange GmbH

A new product range of injection systems for P2X fuels

## W&O Supply Netherlands BV

### Hall B7, Stand 707

View of the W&O RFID tag and valve Source: W&O Supply Netherlands BV

W&O is a global provider of marine valves and maritime fittings from warehouses in Europe, Asia, and North America. At SMM, the company presents it recently launched new digital valve ID programme with RFID technology to reduce costs for vessel managers, allowing them to adopt a time-based preventative maintenance approach to valve replacement.

Across the shipping industry, the adoption of digital technology is helping owners and operators optimise their operations and reduce costs. Proper management of the assessment and procurement of replacement valves, pipes and fittings for a vessel delivers time and cost savings both in the short term and long term.

W&O Supply provides customers with a single consolidated asset tracking system driven by IoT technology. Using RFID tags that can be read by all mobile devices, this trendsetting application reduces turnaround time for replacement products, ensures asset specification accuracy and centralises product maintenance records and certificates.

W&O's experts will discuss this industry-leading offering during the trade fair, as well as how to make the right decisions about valve replacement at the right time and at a competitive price, consistently across global operations.

www.wosupply.com

## Zöllner Signal GmbH

### Hall B6, Stand 326

Zöllner Signal GmbH manufactures sound signalling systems such as ZET horns, macrophones and ZETFONs for all ship types and classes according to COLREG 1972. At SMM, the company is presenting its latest product in the horn range, the development of which involved a team of different specialists, designers and engineers: the Diamond Triple Makrofon YM125. It is designed with a new appearance as well as a specific sound of the horn.

As the sound of a horn is at least as important as its appearance, a lot of time and expertise was invested in the development of the sound. Tone nuances have been revised several times to create a sound experience that is as balanced as possible. Another big challenge was the sound level, which should match the requirements for yachts from 20-200m. All of these carefully developed components can now be found in the new Zöllner Yacht Horn. According to the company, the new Zöllner Yacht Horn is acoustically and visually unique and is a perfect match for yachts in the luxury segment. www.zoellner.de

# Ship&Offshore Buyer's Guide

The Buyer's Guide serves as market review and source of supply listing. Clearly arranged according to references, you find the offers of international shipbuilding and supporting industry in the following 17 columns.

# 2 Propulsion plants

## 2.01 Engines

**MARIDIS**
Maridis GmbH, Friedrich-Barnewitz-Straße 4c
18119 Rostock, Germany
Phone: +49 381 77 89 38 80
spareparts@maridis.de • www.maridis.de

**MarParts: Spare Parts & Components for Main & Auxiliary Engines**

## 2.02 Gears

**REINTJES GmbH**
REINTJES POWERTRAIN SOLUTIONS
Eugen-Reintjes-Str. 7
D-31785 Hameln
Tel. +49 (0)5151 104-0
Fax +49 (0)5151 104-300
info@reintjes-gears.de • www.reintjes-gears.com

**Propulsion systems with power ratings from 250 up to 30,000 kW**

## 2.03 Couplings + brakes

**R+W Antriebselemente GmbH**
Hattsteinstraße 4
63939 Wörth am Main / Germany
Fon: +49 (0)9372-9864-0
Fax: +49 (0)9372-9864-20
email: info@rw-kupplungen.de
www.rw-kupplungen.de

**Couplings, seawater resistent**

## 2.04 Shaft + shaft systems

**Piening Propeller**
Am Altendeich 83 • D-25348 Glückstadt
Tel. +49(0)4124 91 68-0 • Fax +49(0)4124) 37 16
e-mail: pein@piening-propeller.de
Internet: www.piening-propeller.de

**Fixed and Controlable Pitch Propellers, Shaft Gears, Gearboxes**

## 2.05 Propellers

**Piening Propeller**
Am Altendeich 83 • D-25348 Glückstadt
Tel. +49(0)4124 91 68-0 • Fax +49(0)4124) 37 16
e-mail: pein@piening-propeller.de
Internet: www.piening-propeller.de

**Fixed and Controlable Pitch Propellers, Shaft Gears, Gearboxes**

## 2.13 Service + spare parts

**MARK VAN SCHAICK MARINE SERVICES**
Nieuwe Waterwegstraat 7
3115 HE Schiedam, Netherlands
Harbourno. 535
Port of Rotterdam
Tel. +31-10-4090599
Fax +31-10-4090590
info@markvanschaick.nl • www.markvanschaick.com

**Crankshaftrepair (max. length 12m), Repair of Engine- and Industrial parts, Connectingrods and Camshafts, In Situ Machining, Laser Cladding**



# 3 Engine components

## 3.05 Starters

**DÜSTERLOH Fluidtechnik GmbH**
**Abteilung Pneumatik Starter**
Im Vogelsang 105
D-45527 Hattingen
Tel. +49 2324 709 - 0 • Fax +49 2324 709 -110
E-mail: info@duesterloh.de • www.duesterloh.de

**Air Starters for Diesel and Gas Engines up to 9.000 kW**

## 3.07 Filters

**BOLLFILTER Protection Systems**
Boll & Kirch Filterbau GmbH
Siemensstraße 10-14 • 50170 D-Kerpen
Tel.: +49 2273 562-0 • Fax: +49 2273 562-223
E-Mail: info@bollfilter.com • www.bollfilter.com

Applied filtration technology for marine engines and maritime water management

**FIL-TEC Rixen GmbH**
Osterrade 26
D-21031 Hamburg
Tel. +49 (0)40 656 856-0
Fax +49 (0)40 656 57 31
info@fil-tec-rixen.com • www.fil-tec-rixen.com

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**HYDAC**
**HYDAC INTERNATIONAL GMBH**
Industriestraße • D-66280 Sulzbach/Saar
Telefon +49 (0) 6897 509-01
Fax +49 (0) 6897 509-454
E-Mail: info@hydac.com • www.hydac.com

**Fluid management for heavy diesel engines**



## 3.10 Injection systems

**WOODWARD L'orange**
Porschestrasse 8 • 70435 Stuttgart
Tel. +49 711 8 26 09 - 0
sales@lorange.com • www.lorange.com

**Engine components and control systems for large engines from 1,000 to 40,000 kW**

# 4 Corrosion protection

## 4.01 Paintings

**International Farbenwerke GmbH**
**Bereich Schiffsfarben**
Sachsenkamp 5 • D-20097 Hamburg
Tel. (040) 720 03 122 • Fax (040) 720 03 110
e-mail: iphamburg-marine-orderdesk@akzonobel.com
Internet: www.international-marine.com

**Marine Coatings**



# 5 Ships' equipment

## 5.03 Refrigeration • HVAC

**FREUDENBERG INNOVATING TOGETHER**
**Freudenberg**
**Filtration Technologies GmbH & Co. KG**
Tel.+49 (0)6201 7107 264
Weinheim / Germany
viledon@freudenberg-filter.com
www.freudenberg-filter.com

**Filters for intake air filtration of gas turbines, turbo chargers and HVAC systems**

## 5.06 Furniture + interior fittings

**Pfleiderer Deutschland GmbH**
Tel.: +49 (0) 91 81 / 28 480
E-Mail: info@pfleiderer.com
Internet: www.pfleiderer.com

**Wood-based materials for decorative ship interior fitting**

## 5.11 Ballast water management

**Boll & Kirch Filterbau GmbH**
Siemensstraße 10-14 • 50170 D-Kerpen
Tel: +49 2273 562-0 • Fax: +49 2273 562-223
E-Mail: info@bollfilter.com • www.bollfilter.com

Applied filtration technology for marine engines and maritime water management

**HYDAC INTERNATIONAL GMBH**
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Telefon +49 (0) 6897 509-01
Fax +49 (0) 6897 509-454
E-Mail: info@hydac.com • www.hydac.com

**Ballast Water Management**

## 5.16 Refuelling Systems

**Alfons Haar Maschinenbau GmbH & Co. KG**
Fangdieckstraße 67
D-22547 Hamburg
Tel. +49 (40) 83391-0
Fax +49 (40) 844910
Sales@alfons-haar.de
www.alfons-haar.de

**On board helicopter and boat refuelling systems for aviation fuel, petrol and diesel**

**6 Hydraulic + pneumatic**

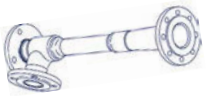
## 6.01 Pumps

**Behrens Pumpen**
von-Thünen-Str. 7
D-28307 Bremen
Tel. +49 421 486 81-0 • Fax +49 421 486 81-11
e-mail: info@behrenspumpen.de
Internet: www.behrenspumpen.de

**Ship Centrifugal Pumps**

**KRACHT**
KRACHT GmbH
Gewerbestr. 20 • D-58791 Werdohl
Tel. +49(0)2392.935 0 • Fax +49(0)2392.935 209
info@kracht.eu • www.kracht.eu

**Lubricating oil gear pumps and fuel gear pumps**



sales@koerting.de
+49 511 2129-446
KOERTING.DE

Körting
THE EJECTOR COMPANY

Bilge and ballast ejectors/eductors

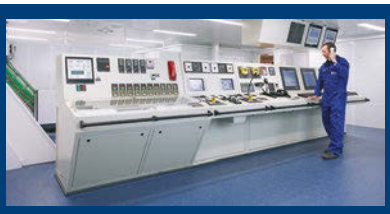
**Leistritz**
Screw pumps & systems
Leistritz Pumpen GmbH | Markgrafenstr. 36-39
90459 Nuremberg | Germany | P +49 911 43060
pumps@leistritz.com | pumps.leistritz.com

## 6.02 Compressors

**Sauer Compressors**

**J.P. Sauer & Sohn Maschinenbau GmbH**
Brauner Berg 15, 24159 Kiel/Germany
PHONE +49 431 3940-0
FAX +49 431 3940-24
E-MAIL info@sauercompressors.de
www.sauercompressors.com

**Air- and water-cooled compressors, air receivers, compressed air dryers and accessories**



**8 Measurement + control devices**

## 8.01 Engine control systems

**AVAT Automation GmbH**
Derendinger Straße 40
D-72072 Tübingen
Tel: +49 7071 97 35-0
Fax: +49 7071 97 35-55
e-mail: info@avat.de
www.avat.de

**Gas & Dual-Fuel Engine Control Systems, Cylinder Pressure & Knock Monitoring, NOx Estimator**

## 8.02 Pressure monitoring

**MARIDIS**
Maridis GmbH, Friedrich-Barnewitz-Straße 4c
18119 Rostock, Germany
Phone: +49 381 77 89 38 80
maridis@maridis.de • www.maridis.de

**MarPrime: Performance/Pressure/ Power Measurement & Reporting**

**VEGA Grieshaber KG**
Am Hohenstein 113
D-77761 Schiltach
Tel. +49(0)7836 50-0 • Fax +49(0)7836 50-201
e-mail: info.de@vega.com • www.vega.com

**Pressure and differential pressure transmitters**

## 8.04 Level measurement systems

**Barksdale**
CONTROL PRODUCTS

**Barksdale GmbH**
Dorn-Assenheimer Strasse 27 • D-61203 Reichelsheim
Tel: +49 (0) 6035-949- 0 • Fax: +49 (0) 6035-949-111
e-mail: info@barksdale.de • www.barksdale.de

**Sensors & Switches to control Pressure, Temperature, Level, Flow**

**VEGA Grieshaber KG**
Am Hohenstein 113
D-77761 Schiltach
Tel. +49(0)7836 50-0 • Fax +49(0)7836 50-201
e-mail: info.de@vega.com • www.vega.com

**Level sensors for all solids & liquids**

## 8.05 Flow measurement

**KRACHT**
KRACHT GmbH
Gewerbestr. 20 • D-58791 Werdohl
Tel. +49(0)2392.935 0 • Fax +49(0)2392.935 209
info@kracht.eu • www.kracht.eu

**high-precision gear and screw type flow meters, fuel consumption measurement, valve position indicators**

## 8.09 Test kits

**Martechnic GmbH**
Adlerhorst 4
D-22459 Hamburg
Tel. +49 (0)40 85 31 28-0
Fax +49 (0)40 85 31 28-16
E-mail: info@martechnic.com
Internet: www.martechnic.com

**Test kits, autom. monitoring systems, sampling devices, ultrasonic cleaning**

## 8.12 Automation equipment

**Bachmann electronic GmbH**
Kreuzäckerweg 33
6800 Feldkirch, Austria
Tel. +43 / 55 22 / 34 97-0
Fax +43 / 55 22 / 34 97-102
info@bachmann.info • www.bachmann.info

**Automation solutions for ships and offshore installations**

## 8.13 Measurement + control devices

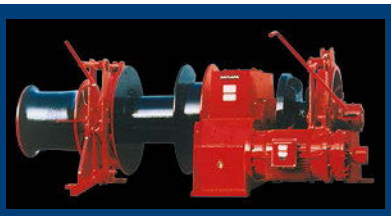
**Aquametro Oil & Marine**
Phone +41 61 725 44 00 / Phone +49 381 382 530 00
info@aquametro-oil-marine.com
www.aquametro-oil-marine.com

**High-precision flow measurement technology to measure the consumption of fuel and heavy oil**

**JUMO GmbH & Co. KG**
Moritz-Juchheim-Straße 1
D-36039 Fulda

Ansprechpartner: Michael Brosig
Telefon +49 661 6003-2788
www.jumo.net
michael.brosig@jumo.net

**Measurement + Control Devices**



# 11 Deck equipment

## 11.01 Cranes

**Global Davit GmbH**
Graf-Zeppelin-Ring 2
D-27211 Bassum
Tel. +49 (0)4241 93 35 0
Fax +49 (0)4241 93 35 25
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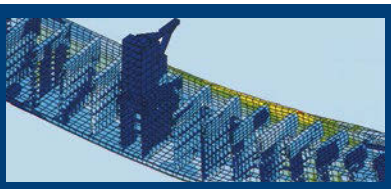

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# 18 Buyer's Guide
## Information

## Buyer's Guide

The **Buyer's Guide** provides a market overview and an index of supply sources. Every entry in the **Buyer's Guide** includes your company logo (4 colour), address and communications data plus a concise description of products or services offered.

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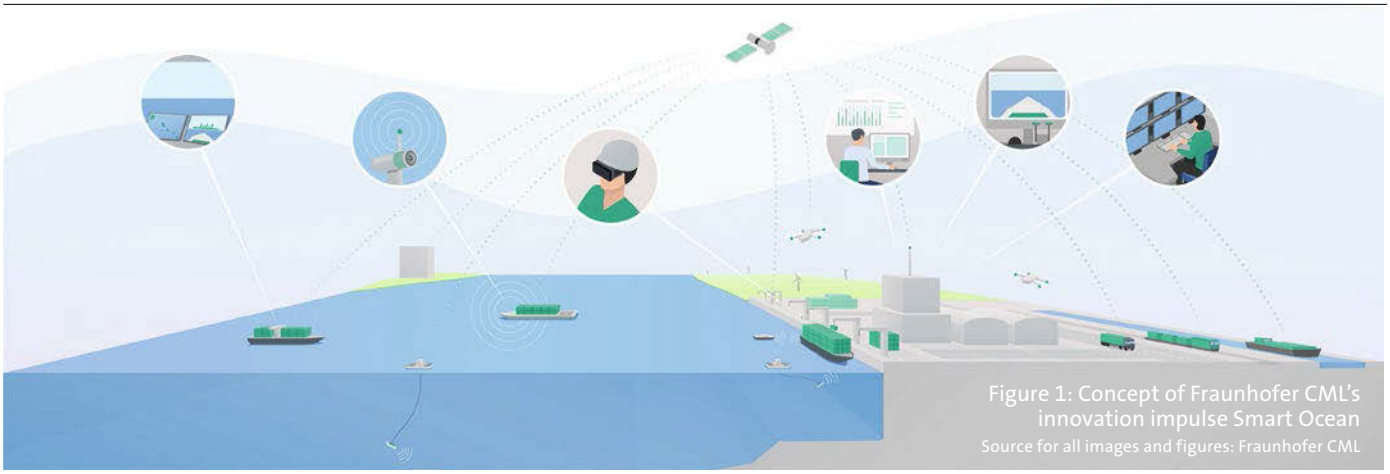

Figure 1: Concept of Fraunhofer CML's innovation impulse Smart Ocean
Source for all images and figures: Fraunhofer CML

# Unmanned vessel fleet for robotic assistance services

**UXV** Robots-as-a-service, big data, sensor fusion, artificial intelligence and robotic swarms are key components for future maritime operations. A novel platform, which interconnects surface, aerial, underwater and crawling vessels (UXVs), has been set up by the "Maritime Technologies and Biomimetics" team at Hamburg's Fraunhofer CML in order to research and demonstrate such services. The projects that are incorporated in the "Smart Ocean" initiative are described here by Johannes Oeffner, Team Leader "Maritime Technologies and Biomimetics", Fraunhofer CML.

The Fraunhofer Gesellschaft and ten other European research and technology organisations have initiated the joint innovation platform Sustainable Sea and Ocean Solutions (ISSS) to develop and master innovative technologies for a sustainable Blue Economy and support an internationally competitive European maritime industry [8]. In this regard, Fraunhofer CML is setting up the ISSS North Sea hub focusing on specific research needs in this area.

The Blue Economy includes all economic marine-based or marine-related activities involving oceans, seas and coasts. In 2019, all sectors combined generated a turnover of EUR 667.2 billion. A sustainable Blue Economy requires innovative maritime service activities through increased use of artificial intelligence, connectivity, automation, and robotics [9].

Fraunhofer CML's research includes the following initiatives:

- the EU project SCIPPER [10] to develop remote ship emission monitoring systems;
- the EU project AIRCOAT [11] assesses novel biomimetic hull coatings to increase ships' efficiency;
- autonomous shipping and navigation systems are investigated in the projects MUNIN [12], FERNSAMS [13] and BZERO [14].

To strengthen the maritime industry by intensifying research and innovation activities [15], the Fraunhofer CML has created the "Smart Ocean" initiative. It includes:

- intelligent assistance systems;
- advanced sensor technology;
- virtual reality;
- seamlessly interconnected stakeholders;
- remote control;
- big data and AI (Figure 1).

The maritime sector urgently needs sustainable innovations. These are essential to meet current decarbonisation regulations set by the European Green Deal [1], the International Maritime Organization IMO [2], the UN Sustainable Development Goals [3] and to align with climate change policies such as the Paris Agreement [4] and the International Panel on Climate Change IPPC [5]. Companies' own net-zero emissions targets are also key drivers – Shell by 2050 [6], for example, and Maersk by 2040 [7].

| Vehicle Properties | Modularity | Sensors | Robotic Integration |
|---|---|---|---|
| Compact size of 1.5 x 2.2m | Reconfigurable deck | LIDAR | Remotely operated vehicles (ROV) A-Frame |
| 24h endurance at 8 knots | Adjustable payload of up to 100 kg | Stereo cameras, 360° camera for VR control | Landing platform for aerial drones (UAV) |
| Robot operating system - ROS | Modular power grid 5/12/24/48V at 300W | Echosounder, (Multibeam ready) | Battery hot swap |
| Electrically powered – 2 x 1 kW power | Modular deck equipment | Underwater positioning (DVL) | Crawler |
| Payload 120kg | Cylinder compartments for electronics | AIS, Radar | Autonomous underwater vehicles (AUV) |

Table 1: Key features of SeaML:SeaLion

## The UXV fleet

Within Smart Ocean, the Maritime Technologies and Biomimetics team has established a robotic fleet of surface, aerial, underwater and crawling vessels (UXVs). The heart of the fleet is the autonomous surface vehicle (ASV) SeaML:SeaLion (Figure 2) [16], a modular research catamaran (Table 1), developed in-house.

The ROS-based control software allows for precise autonomous or remote navigation and its web-based user interface (webUI) enables robust and secure job allocation, data processing, sensor monitoring and vessel operation from any device and location. SeaLion is hydrodynamically optimised for maximum speed and stability. It is designed so that it can be customised on deck and underwater with all electronics stored in the hull and an on-board electric power network of autonomous industry standards.

SeaML:SeaLion works as the mothership for the other UXVs. The SeaML:ROV, for example, is a commercial ROV (BlueROV2) used for inspection services. The SeaLion is fitted with a movable A-Frame and a customised winch system for autonomous launch-and-rescue of the ROV, that is powered by the electrical board net. The SeaML:Magic is a commercial magnetic crawling robot (Deeptrecker DT640) with a front-facing camera that is equipped with a thickness measurement. The SeaML:EyeML is a commercial but customised DJI M300 drone with autonomous landing software and gas sensors for air quality monitoring. A landing platform equipped with a battery hot swap system increases mission range. All systems are controlled via a Web Service Layer allowing different operators simultaneously to control various robotic systems remotely. The integrity and traceability of data are guaranteed through the authentication and access control mechanism.

## Maritime robotic assistance services

The modular robots incorporate survey-specific measurement equipment. A specified task description is fed into the UXV's software system. Information is delivered to the user for live task monitoring and saved in the cloud for subsequent data analysis. To keep the human in the loop, the entire operation is supervised by an operator to ensure that all safety requirements for safe dispatch and recovery of the robotic vessel are in place.

Many service applications have already been demonstrated. Within RoboVaaS [17], a focus was laid on ship/quay wall inspection and environmental data collection. In the EU project RAPID [18], drones were launched from the SeaLion for aerial inspections of port infrastructure (e.g., bridge pillars).

In the EU project SeaClear, the robots were used as a small-scale testbed. A fleet of autonomous robotic vehicles were deployed in the air, on and under the water to detect and collect litter. In the VISION project a concept for ship hull inspection and thickness measuring was developed to reduce drydocking times as well as provide fast and simple incident investigations.

The fleet can be modified and used for other support services such as hull cleaning, detection of illicit goods or threats, and high-quality cost-effective autonomous bathymetry surveys. With collision regulations always a key parameter, future work projects address scope for autonomous docking, autonomous SLAM navigation, object detection and robust positioning for effective collision avoidance in operation. A scaled-up and offshore-capable version is in development to provide an autonomous UWO removal and other functions in the offshore energy sector.

The CML will demonstrate the UXV fleet at this year's SMM, stand B6 / 327.

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Figure 2: The Fraunhofer CML SeaML:SeaLion

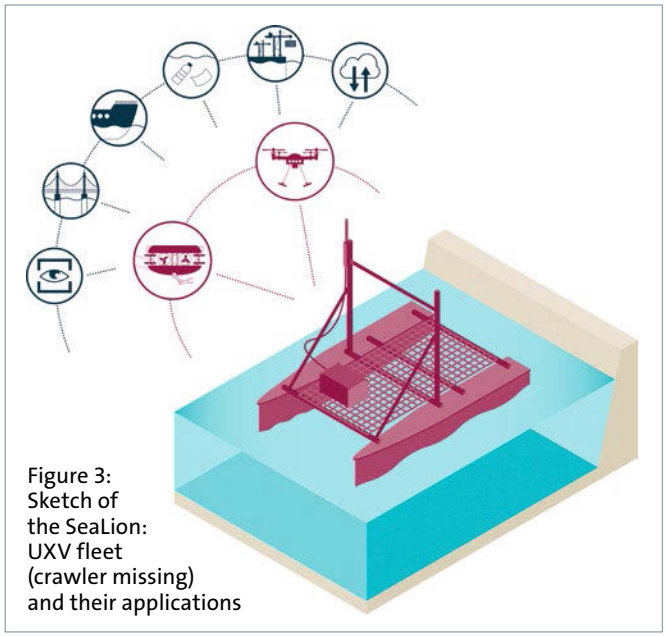


Figure 3: Sketch of the SeaLion: UXV fleet (crawler missing) and their applications

# Esbjerg Declaration supercharges Europe's offshore wind drive

WINDENERGY HAMBURG | Four of Europe's offshore wind powerhouses recently committed to install at least 65 GW of offshore wind energy by 2030. Germany, Netherlands, Denmark and Belgium agreed the target figure as part of the Esbjerg Declaration in May. The pact between the four countries comes as an energy crisis looms closer across the continent in the wake of energy supply disruption caused by Russia's invasion of Ukraine.

The Declaration also comes only a short time ahead of WindEnergy Hamburg 2022, due to be held from September 27th to September 30th. All four countries, together with many others, are likely to be there in force, as offshore wind climbs the sustainable energy agenda in many parts of the world.

Last year, China overtook the UK with the most installed capacity, and the United States has embarked on a dramatic campaign to develop offshore wind capacity on both east and west coasts. President Biden has set a target of 30 GW of installed capacity by 2030, an ambitious target from an almost standing start.

Three of the four Esbjerg signatories have the largest representation at the WindEnergy event. Germany and Denmark are number one and two, closely followed by the Netherlands, with 73 registered stands, 30 of them participating in the Dutch Village of the Netherlands WindEnergy Association (NWEA).

The country has far-reaching ambitions of its own, with offshore wind a key component in its aim to achieve 100% renewable energy by 2050. Earlier this year, the Netherlands' 2030 offshore wind target was hiked by 10 GW, with 21 GW now to be added between now and the end of the decade. The May tender for the 1.4-GW wind farm, *Hollandse Kust West*, generated much interest, not least because it is thought to be the world's first tender in which non-pricing criteria, including ecology and system integration, are specific criteria.

Danielle Veldman is in charge of Dutch participation at WindEnergy Hamburg. Speaking on behalf of the NWEA, she said: "This first post-pandemic year proves exciting for Dutch wind power development in multiple areas. Hamburg offers the best professional wind industry platform in Europe for many Dutch exhibitors to professionally present themselves, expand their networks, and strengthen their position in a globalising business environment."

The Dutch contingent looks set to represent comprehensively the various sectors of the offshore wind value chain. It will include companies specialising in subsea construction, anchoring systems, ship-operating installation specialists, motion-compensated technology providers, crane and cable manufacturers, and consultants with a broad range of specialisms.

GustoMSC will be a prominent exhibitor. Several of the latest generation installation vessels are being built to the company's designs. The *Charybdis* is one example. Currently under construction at Keppel AmFELS in Brownsville, Texas, the self-propelled jack-up was the first Jones Act-compliant contract for a major offshore wind sector vessel to be ordered at a United States shipyard. The vessel, with a price tag of around USD 500 million, was ordered in 2020 by US power company, Dominion Energy, and is due for delivery at the end of 2023. It will then be deployed in the development of the *Revolution Wind* and *Sunrise Wind* farms off the coast of Massachusetts, for Denmark's Ørsted and Boston-based Eversource.

Meanwhile, Danish offshore contractor, Cadeler, has ordered its third Gusto-designed jack-up, the largest offshore wind vessel so far. The unit is designed to enable swift conversion from foundation installing to turbine installations. The vessel will have the world's first telescopic offshore wind crane, battery hybrid systems and a significantly smaller carbon footprint compared with existing ships of this type.


WindEnergy Hamburg will be held from September 27th to September 30th

Source: HMC

# Offshore inspection contract awarded

NORTH / BALTIC SEAS | Deutsche Windtechnik AG, headquartered in Bremen, Germany, has received extensive orders for underwater inspections of wind farms in the North and Baltic seas. More than 300 surveys are to be carried out in 2022 and 2023 as part of a cluster concept focused on cost savings and sustainability for the offshore wind farms *Borkum I*, *DanTysk*, *Sandbank*, *Butendiek* and three other wind farms in the areas. According to information from Deutsche Windtechnik, the inspection work has already begun. As part of this, the foundations of the wind turbines, the structure of the substations, the wind measurement masts, the corrosion protection systems and the cables from the point of entry into the foundation to the point of entry into the ground will be examined and the condition documented, among other things. By locating damage early, the company says it can minimise downtime and extend the life of the wind turbine. "The results and analyses of our underwater surveys provide our customers with detailed and reliable information about the condition of their turbines that goes far beyond the standard requirements of the authorities," said Niels Noordeloos, business development manager at Deutsche Windtechnik BV, the company's Dutch subsidiary. Deutsche Windtechnik works with Dutch offshore service provider Bluestream and Glückstadt-based shipping company OS Energy on the inspections. "Working with both partners allows Deutsche Windtechnik to have a highly efficient vessel including an ROV (remotely operated vehicle) with exactly the tools needed for the job: high-resolution cameras, cleaning tools, ultrasonic and laser measurement systems, and much more. All sides derive a benefit from cluster management, expertise, shared mobilisation costs, fuel-saving route bundling and very accurate documentation," added Geert Timmers, managing director of Deutsche Windtechnik BV.

With the support of an ROV, more than 300 surveys are to be carried out
Source: Deutsche Windtechnik AG

# Propulsion package for wind installation vessel

NEWBUILDING | Steerprop, a designer and manufacturer of high-performance propulsion systems, has been awarded a major order to supply the complete propulsion package for a wind installation vessel (WIV) of latest design.

The order was placed by Singapore-based Sembcorp Marine Ltd which has secured a contract for construction of the vessel from Maersk Supply Service of Denmark.

The company's scope includes six of Steerprop's ducted L-drive azimuth propulsors with a power output of 4,500 kW and two 900 kW Steerprop Tunnel Thrusters for dynamic positioning, manoeuvring, and transit operations. To support safe and reliable operations with low lifecycle costs, Steerprop Care condition monitoring is also included as part of the package.

Delivery of the WIV is expected in 2025 Source: Maersk Supply Service

The jack-up WIV is equipped with a load transfer system patented by Maersk Supply Service. The design also takes into consideration the need to operate safely and efficiently in the harsh sea conditions the vessel is likely to face while serving the *Empire Offshore Wind* project off the eastern coast of the United States. This set high demands for propulsion efficiency and reliability, which Steerprop was able to meet.

Senior Vice President at Sembcorp Marine Rigs & Floaters, Wong Teck Cheong, commented: "In collaboration with Maersk Supply Service, Sembcorp Marine will design and build a WIV capable of operating at a high level of efficiency and to handle the next generation of wind turbines which are scaled up in size with longer and lighter rotor blades and taller towers. The vessel is designed to cope with the installation of bigger structures and to ensure operational efficiency for wind turbine installations. The Steerprop thrusters will play an essential role in enabling this efficiency."

# First composite hull for Wave Energy Converter launched

HIWAVE-5 PROJECT | CorPower Ocean, together with team members Autonational and CPT Tankwell, specialists in composite machinery and tanks, have recently unveiled the first commercial-scale composite Wave Energy Converter (WEC) hull at a global launch event in Stockholm. The hull was developed using a custom-built manufacturing cell at CorPower's environmentally controlled composite production facilities in Viano do Castelo, Portugal.

It will form a key component in the HiWave-5 Project, involving ocean deployment off the coast near Aguçadoura, Portugal. Its launch follows process characterisation, many iterations, and continuous tuning work of quarter-scale models, CorPower said. These have been assessed, reviewed and approved by DNV as a certification body, paving the way for full commercial production at scale.

Hull construction has been completed alongside dry-testing of CorPower's power-take-off system, using the world's largest wave energy test rig. The company's first commercial-scale C4 WEC will form part of a larger four-system array at one of the world's first wave farms, generating energy for Portugal's national grid.

Miguel Silva, CorPower Ocean Portugal's managing director, declared: "This has been a tremendous team effort involving our specialist composite team in Portugal and Sweden, with close cooperation with our local and global supply chain partners. The C4 hull has been designed with a low-cost sandwich structure comprising of filament-wound composite skins for the inner and outer layer separated by a core material.

The hull will be deployed off the Portuguese coast near Aguçadoura

Source: CorPower

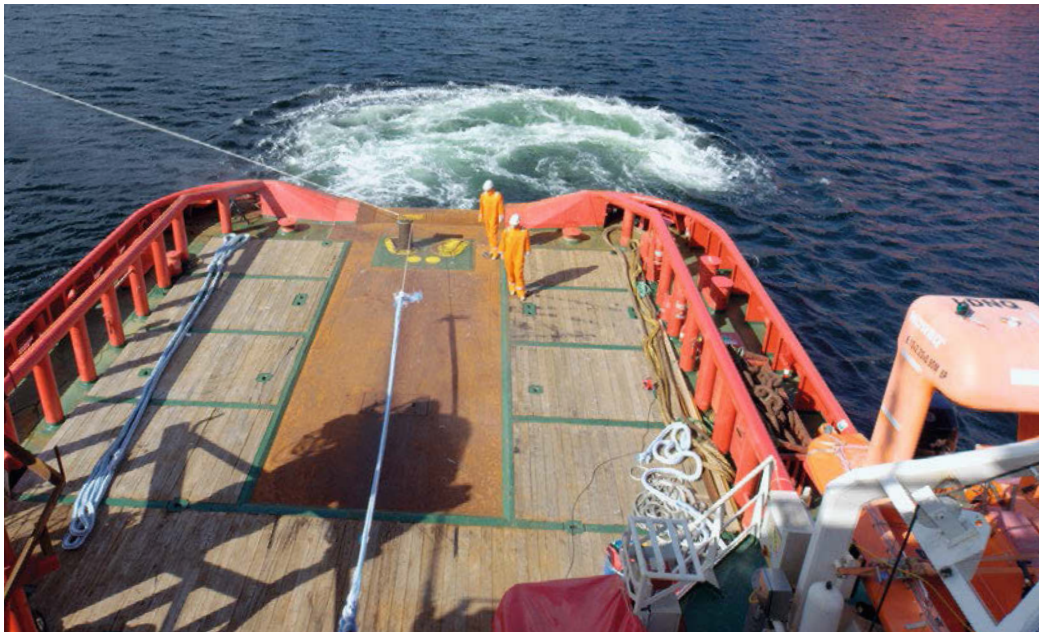
"This approach brings a raft of benefits," he continued, "including high strength, durability and impact resistance combined with light weight and buoyancy performance properties, which can withstand fatigue, slamming and impact loads. Other important features include excellent adhesion strength and chemical resistance with low water absorption."

His colleague, Tord Jonsson, Supply Chain & Quality manager, said: "Based on the R&D cell in Viana do Castelo, future versions of such manufacturing cells can be easily integrated in port or final assembly facilities, amounting to 'mobile factories'. This will enable composite hulls to be built rapidly on customer sites, with additive manufacturing dramatically reducing lead times, cost and carbon footprint by eliminating transportation of the finished product. Delivering wave farms to our customers, we will be moving these factory cells from site to site, to produce the hulls needed for a project, then move the cells over to the next customer site."

The company's ultimate aim is to introduce certified and warranted WEC products to the market, CEO Patrik Möller said, making wave energy a bankable technology to attract mainstream renewable project finance and drive rapid deployment scale-up to address climate change.

# Snap back arrestor ropes ensure safer mooring

**'SNAP-BACK' EFFECT** Mooring operations are a common task at ports and terminals and one of the most challenging aspects of day-to-day vessel operation. As an industry innovator, Timm Ropes by Wilhelmsen has designed a unique proprietary system to reduce the dangerous 'snap-back' effect. This protects transported goods and, more importantly, the safety of personnel both on deck and on the quayside.



Timm SBA ropes undergoing tests in real-world conditions in Flekkefjord, Norway

Mooring lines are manufactured with a given strength based on the specific Ship Design Minimum Breaking Load (SDMBL), as stipulated in the Oil Companies International Marine Forum (OCIMF) Mooring Equipment Guidelines (MEG4). This industry publication covers the safe mooring of tankers and gas carriers at terminals but is also relevant for other types of vessels. When the design load on ropes is exceeded, they should break to prevent damage to on-board and quayside mooring equipment.

Every type of mooring rope displays 'snap back' if they fail under tension. "When a line breaks, the released energy makes the rope snap back uncontrollably, travelling at speeds up to 800km/h and striking everything in its path with extraordinary force," said Veronika Aspelund, Ropes business director at Wilhelmsen Ships Service.

Despite it being a familiar routine, this phenomenon means mooring remains one of the riskiest jobs seafarers and port workers undertake. There have been accidents during mooring operations that have led to severe injury or death. According to the UK P&I Club, snap back accounts for a staggering 53% of mooring accidents, with a sobering one in seven resulting in fatalities [1]. Constant awareness, risk evaluation and crew training are crucial – in addition to the proper selection of the ropes.

## Mooring regulations

Over the years, regulators have actively reviewed and updated rules and guidelines to reduce the number of such incidents. The heightened emphasis on safety means industry stakeholders continuously explore safer ways to mitigate the inherent risks.

In 2018, the fourth edition of the MEG4 introduced minimum design principles, advocating a systematic approach to the safe design of mooring equipment and highlighting a line management plan and mooring system management plan (MSMP), again especially for tankers and gas carriers. New IMO requirements on safer mooring are due to enter into force in January 2024.

Amendments were made by the IMO Sub-Committee on Ship Design and Construction (SDC 6) in 2019. They concurred on a unified mooring system for equipment and ropes, but the human-centric design and tension monitoring elements have been removed from the recommendations. Ship operators should start preparing accordingly.

Despite the current absence of a dedicated regulation requiring a snap-back prevention feature in mooring ropes, there are system designs on the market that reduce the risk of snap back and make mooring operations safer. Several ports and terminals have taken independent measures to implement innovative technologies or create incentives for vessels to use mooring ropes with reduced snap back.

## Innovative safety feature

Timm Ropes by Wilhelmsen has pioneered the Snap Back Arrestor (SBA) technology and the range of Timm ropes incorporating SBA has undergone years of research and development. The feature has been rigorously tested both at a testing facility and in a simulated real-world environment.

The Timm SBA core located in the middle of the main line allows full utilisation of the rope's elongation capacity. This is possible thanks to the hollow braided construction of twelve-strand ropes and therefore SBA is only available in twelve-strand ropes and tails. Timm also developed a unique method for securing the SBA core to the rope ends (mooring eyes).

The SBA is non-load bearing during normal rope operations. In the event of rope breakage, the SBA will absorb part of the energy released and "guide" the broken rope strand along the rope's axis, resulting in a significant reduction in snap back. "If load remains applied after the rope breaks, the SBA will bear the load and elongate before itself breaking," said Omar Labib, technical sales manager for Ropes at Wilhelmsen Ships Service. However, it cannot sustain high loads and will release much less energy when it does break.

## Qualifying factors

Given the greater focus on safe mooring operations, several anti-snap-back rope designs are now available worldwide. However, choosing the best and most effective option can be a complex process. As more products come on the market, finding the one that best answers the following fundamental questions will help safeguard the crew and prevent injuries:

### Has it been tested?

Extensive testing is the only way to obtain specific data on how a mooring rope performs under different conditions. Therefore, rather than simply digesting a brief overview of a particular rope's performance, elongation, abrasion, and durability, ask to what extent trained professionals have tested the mooring rope, following industry standards.

At the test facility in Slovakia, the company performs tests on fibre ropes using a state-of-the-art test bench that can withstand a testing limit of up to 300 tonnes. All tests are conducted by trained personnel in accordance with strict standards and class requirements.

### Is the system proven under real-life mooring conditions?

While a controlled laboratory environment offers a good indication of product performance, not all factors can be assessed in a lab setup. It is equally important that the rope has been proven to be effective in real-life testing in a simulated environment. This provides critical verification of any new technology.

Various factors in real-life mooring conditions affect the expected lifespan and performance of a rope. It is therefore essential to consider parameters such as vessel type, mooring arrangement, mooring design, the position of the rope, trading pattern, ports, cargo type and environmental factors.

The Timm SBA product has been tested in a real-life operation on a tug vessel in Flekkefjord, Norway, where the performance of ropes with SBA was compared with ropes without SBA. The tests demonstrated that the ropes equipped with SBA present a much lower risk to personnel in the event of rope breakage.

### Is the rope verified?

With new technology like Timm SBA and other snap-back products, approvals and verification by leading classification societies is tangible proof on the specifications and performance of the anti-snap-back function. An unbiased third-party assessment is a great indicator of whether the product is of the quality promised by the manufacturer.

Timm works closely with top classification societies around the world. Timm ropes are type-approved by DNV and ClassNK and meet the OCIMF MEG4 guidelines. SBA is verified by DNV.

## Proven in the field

The final proof of performance is a product's track record in the field. Many successful operations of the rope in different dimensions, different environments and by different people, show the robustness of the product and provide confidence in its design.

"Since introducing our SBA rope in 2019, the company has received much positive feedback from customers stating that the Timm SBA has significantly reduced the snap-back effect when ropes have broken," reported Pirjetta Stüven, sales manager Germany, Poland, and Baltics at Wilhelmsen Ships Service. "In one real-life incident, our Timm Master 12 SBA ropes prevented snap-back-related injuries on a Kassian Maritime panamax bulker as it battled stormy weather at the port of Acajutla in El Salvador. The violent motions of the ship while unloading cargo at berth resulted in four sets of mooring ropes snapping, but because of the SBA feature no crew members were hurt."

## Towards safer mooring

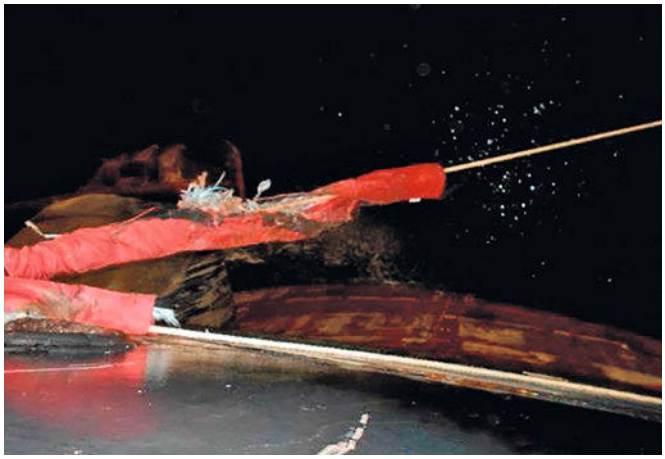
New technologies and improvement of existing rope management systems, as well as shipboard training and maintenance, are crucial to improve the safety of mooring operations. Advanced products, new digital tools that support rope monitoring and inspection, proper installation, usage, and maintenance, as well as competent crew and properly maintained equipment are all pieces of the puzzle that contribute to enhanced safety.

## Reference

[1] UK P&I Club – Risk Focus: Moorings, 2016

Source for all images: Timm Ropes by Wilhelmsen

Timm Master 12 SBA rope with the SBA core located in the middle of the main line



Broken ropes with the SBA still intact. This feature prevented highly dangerous snap back.

# New antennas improve live TV performance at sea


Source: Intellian

The new antennas come with an upgrade to Intellian's patented WorldView™ Technology, which allows for seamless television viewing on board while ships move between regional services anywhere in the world

**CONTINUOUS CONNECTIONS |** South Korea's Intellian Technologies has released details of two new ranges of satellite TV receive-only antennas set to be launched in the next few months. The antennas will upgrade user experience, the company said, with faster and continuous connections.

The new t-Series, available from September, will be an upgrade to the company's trademarked WorldView™ Technology and will enable live TV to be viewed on board ship anywhere in the world, Intellian said. There will be four t-type models, ranging in size from 85cm to 150cm and suitable for small vessels of 6m to large ships of 300m in length and more.

The new s-Series, meanwhile, is to be launched later in the year and is designed for the United States regional market. Two new units will be dual Ka-band for the United States, and Ku-band for the Mediterranean.

The t-Series has 40% fewer spare parts than earlier models, Intellian said, lowering the cost of ownership and simplifying installation. The antennas have an unlimited 360° azimuth rotation system, ensuring that the TV signal in not interrupted when vessels are manoeuvring. Meanwhile, a new antenna control unit facilitates faster downloading of log files and upgrades to the t-Series models.

Intellian CEO, Eric Sung, said: "Satellite TV antennas have always been of huge importance to Intellian and that hasn't changed. Our first ever Intellian product was the i4, a satellite TV antenna we launched back in 2004 which brought live sports, current affairs and broadcasting to mariners all over the world.

"With many launches since then," he continued, "this new t-Series marks Intellian's continued leadership in satellite antenna innovation and commitment to improving user and customer experience. With live TV crucial in keeping seafarers connected to home territories and maintaining morale on working vessels, we're proud to launch a product to bring more value and improved experience to maritime customers."

# Portfolio of radio communication technologies expanded

**AIS/VDES |** The Swedish company Saab TransponderTech has expanded its portfolio of AIS (automatic identification system) and VDES (VHF data exchange system) technologies. The R6 Supreme system is the new generation of shipborne Class-A transponder systems. It is type-approved for AIS and prepared for future VDES functionality with the latest software-defined radio, providing an AIS sensitivity of -118 dBm (decibels relative to one milliwatt).

The R60 VDES Base Station is a VDES-compliant base station, including AIS and ASM (application specific messages) functionality. It is also prepared for the new VDE (VHF data exchange) channels, pending international approval.

## Easy-to-assess information

The R6 Supreme is intuitive and easy to operate and designed to be a tool for everyday work, Saab said in a statement. It is equipped with an all-new control and display unit (CDU), featuring a speedy modern graphical user interface (GUI) in a brilliant, seven-inch touch display with accurate colours at any viewing angle, legible even in sunlight. The display has a resolution of 1024x600 pixels in more than 16 million colours.

The CDU has an interface for central bridge equipment dimming. All information is easy to access through a GUI that resembles a modern smartphone, Saab stated.

The R6 Supreme can be integrated with a Saab type-approved Navigation GNSS receiver to share the CDU and minimise the number of screens on the bridge. This also lowers the cost for equipment and installation. It meets Class-A AIS radio requirements and implements advanced wave forms and communication protocols as defined by the VDES standards.

## High quality, stable performance

The R60 VDES Base Station is the successor to the R40 AIS Base Station, which assures high quality and stable performance. Thanks to its Software Defined Radio (SDR) design, it is future-proof and can support upcoming changes to international standards and requirements. The R60 is compliant with the RED Directive and applicable to international standards such as VDES-standard, AIS Base Station Standard IEC 62320-1, Aton Standard IEC 62320-2 and AIS Repeater Standard 62320-3.

Its main purpose is to receive data from and transmit data to AIS/VDES-equipped vessels travelling within the coverage area of the base station. The R60 can either be installed on a stand-alone basis or integrated into a network, such as the Saab MARITIMECONTROL platform.

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# Ship agent sets out guidelines for operations in Africa

PORT CALLS | The diverse nature of countries, port and terminals, cargoes, ship types and business methods across the African continent generate significant challenges for shipowners and operators. That is why it is important to have the support of a significant ship agency with a combination of continent-wide representation and good local connections. This was the recent message from Inchcape Shipping Services' (ISS) area general manager, Africa, Adrian Richter.

"Our greatest asset is our people, with in-depth local knowledge, skills and passion, as well as the right attitude, motivation and leadership to handle this 24/7 business and the diverse challenges of voyage transits on the continent," Richter commented. "No port call is the same and each one carries different risks and challenges that can only be resolved through having professional staff on the ground trained to tackle such issues with the focus on risk and cost mitigation for the shipowner. One of Inchcape's main strengths is that we are an all-rounder able to handle all different types of vessels."

With 300 staff working in more than 40 ports across the continent, Inchcape is well connected, equally as capable of providing agency services in general cargo ports as specialised services in locations offering certain services. Richter cited examples including Mombasa as Kenya's grain and steel shipments hub, Richards Bay for coal, and Namibia's Walvis Bay for ship repair, drydockings and lay-ups. Port Louis in Mauritius, meanwhile, is an important bunkering port.

As an all-rounder in agency terms, ISS offers a broad range of services, including but not limited to crew changes, bunker calls, third-party liner agency, P&I representation, ship chandlering and cruise consultancy. However, some of the most important services that the company offers in its African setup are owners' protective agency (OPA), familiarity with local regulations, managing the risks of bribery and corruption, and of course ensuring robust security.

The OPA function was highlighted by the company's West Africa Area Manager, PT Ramdas. The best interests of the shipowner must be assured by making sure that local regulations are followed, he said. Even minor rule deviations found by customs and immigration officials boarding vessels can result in cumulative fines averaging as much as USD 20,000 per ship.

Meanwhile, the lack of berth booking systems makes timely information on ships' arrival times very important, with advice to speed up or slow down depending on berth availability. The efficacy of cargo operations is another potential headache – the process is labour-intensive and liable to equipment breakdown, Richter said.

ISS is also continuing to develop digital systems that became so important during the pandemic. These include systems to track changes in protocols, flight details including cancellations, and crew repatriation. The company is also deploying underwater drones to inspect ships' hulls and propellers without using divers. Inchcape is now the sole accredited water drone operator in Mauritius where it also specialises in bunker calls and bunker quantity surveys.

Crew changes carried out by Inchcape outside port limits off South Africa
Source: Inchcape

# Port state control inspectors to focus on STCW compliance

CREW STANDARDS | A three-month Concentrated Inspection Campaign (CIC) has been announced by the Paris and Tokyo Memoranda of Understandings to focus on standards of training, certification and watchkeeping (STCW) compliance. The CIC will run from the beginning of September to the end of November and will be carried out in conjunction with the normal Port State Control (PSC) inspection. Ships will only undergo one CIC during the period.

The object of the CIC is to confirm that:

- Seafarer numbers on board and their certificates are in conformity with the relevant provisions of the STCW Convention, and the applicable safe manning requirements are in accordance with flag state requirements;
- Seafarers on board, who are required to be certificated in accordance with the STCW Convention, hold an appropriate certificate or a valid dispensation, or provide documentary proof that an application for an endorsement has been submitted to the flag administration;
- Seafarers on board hold a valid medical certificate, as required by the Convention;
- The watch-keeping schedules and hours of rest indicate compliance with the requirements of the Convention;
- The CIC will raise awareness of shipowners, operators and crew on the specific requirements of the Convention.

Port State Control inspectors will expect vessels to comply fully with statutory and non-statutory requirements. They must be appropriately manned and provide evidence of crew members' appropriate qualifications.

Shore-based managers will also have to meet their obligations, not least by arranging timely access to vessels for inspection and ensuring that there are no grounds on which ships under their control could be detained.

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