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A once-in-a-lifetime opportunity

June 1st marked the official start of the United Nation's proclaimed Decade of Ocean Science for Sustainable Development ("Ocean Decade"). The main aim of this initiative, which will last from 2021 to 2030, is to educate and create opportunities for dialogue to sharpen awareness of the current worrying state of the oceans and establish ways to rethink.

In an official statement it says, "The Decade will provide a 'once-in-a-lifetime' opportunity to create a new foundation, across the science-policy interface, to strengthen the management of our oceans and coasts for the benefit of humanity."

The good health of the oceans as a basis of life and economic space is actually not debatable for mankind. And yet the destruction caused by littering, pollution and overfishing has hardly been countered at all until very recently. This is a task for society as a whole, politics, the economy and every individual. Naturally, also the maritime industry has an important role to play in this context.

An initiative like the Ocean Decade can only be crowned with success if it is brought to life in the right places. Extensive evaluations and written down objectives are good and important, but will initially do little to change the status quo.

The maritime industry with its differentiated business segments has been active and is now more so than ever working towards zero-emission shipping and thus not only a healthier ocean but also climate goal compliance.

Looking back at the past decade, it has produced outstanding developments and technologies. With the offshore wind industry alone, a completely new sector was launched within a very short time.

And especially in engine technology, quantum leaps have been made. Dual-fuel and pure gas engines have been developed in a short time and are now an integral part of the maritime supply industry. Now we are talking about fuel cells and hydrogen-based synthetic fuels that could bring the use of fossil fuels to an end. The traditional diesel engine could prove to be a thing of the past in the not too distant future.

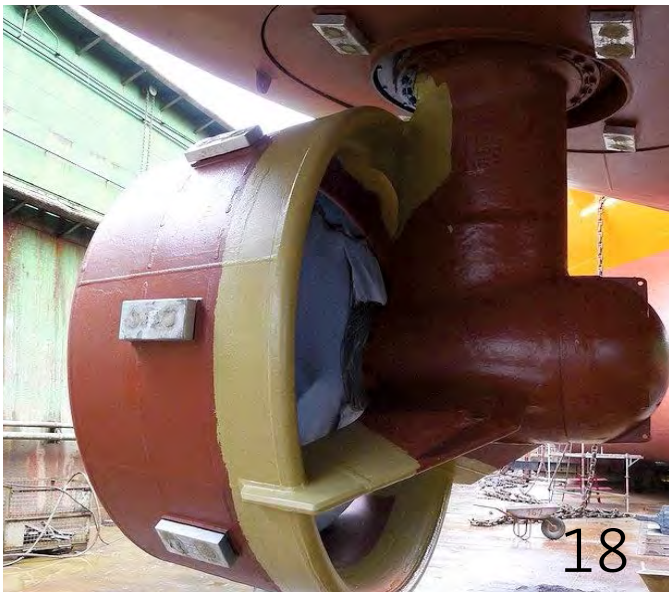
So, it is actually possible to make a change within ten years! However, it is of immense importance to get all stakeholders "on board". And that certainly includes the interests of economy.

What's more, in an industry that is more globalised than any other, it is probably the greatest feat to unite different interests and cultures, but also the concerns and needs of the most diverse nations and societies. Solo attempts will never be effective so the lowest common denominator must be found.

This, unfortunately, contributes to the fact that the full potential – especially in the area of international regulations – can never be fully exploited, as just shown at the most recent MEPC session regarding the possible reduction measures of CO_2 emissions.

Be that as it may. But let us all try to seize the opportunity together to change the mindset and ensure a sustainable socio-economic use of the oceans in the future. The potential is certainly there.

More in-depth information and background research on sustainability topics, including the results of the latest MEPC session, can be found in our 2021 GreenTech edition, which is enclosed with this issue of Ship&Offshore.



Shipbuilding & Equipment

Regulars

Offshore & Marine Technology

In Focus: Classification & Consulting

Ship Operation

The *Crystal Endeavor i*s the ninth vessel in Crystal Cruises' fleet

Source: MV Werften

Ice-class expedition cruise ship named

Crystal Endeavor | The 20,200gt expedition cruise ship *Crystal Endeavor* has been named at MV Werften in Stralsund by Manuela Schwesig, Prime Minister of Mecklenburg-Western Pomerania. Originally, the vessel was due to be commissioned last year.

The event was attended by various prominent state and federal politicians, Genting Hong Kong's group president, Colin Au, and MV Werften managing directors, Peter Fetten and Carsten J. Haake. The ceremony was also viewed by several thousand people around the world on YouTube and Facebook.

The 164m-long ship is exceptional in a number of ways. It is the world's largest and Germany's first expedition vessel to be built with Polar Class 6. It has 100 suites ranging from 28m² to 105m² for 200 passengers, a 24-hour butler service, six gourmet restaurants, a casino, two helicopters, 18 Zodiacs, 14 kayaks and a six-person submersible.

Genting Hong Kong chairman, Tan Sri Kok Thay Lim, noted that the ship has the most installed power per gross ton of any cruise ship, the largest space ratio at more than 100gt per passenger, and a one-to-one staff to passenger ratio.

Call for papers

CIMAC World Congress | The 30th CIMAC World Congress will be held from June 13th to 17th 2022 in Busan, South Korea. The organisers have now opened the call for papers.

All interested stakeholders are invited to submit their proposals for the Technical Programme of the Congress. The deadline is August 10th. The acceptance notification will be sent to authors by October 25th at the latest.

Every three years, the CIMAC World Congress brings together various stakeholders to discuss the latest in engine technology. The 2022 edition of the Congress will see the four topical categories: "Intelligent Power Systems", "Towards Zero Emissions", "Proven Technologies" and "Fundamental Research".

More information for submitting a paper is available at

https://www.cimaccongress.com/call-for-papers/index.html

Illustration of the new research vessel

Source: Ulstein

Research vessel for KIGAM

Seismic industry | Ulstein has entered into an agreement for construction of an Ulstein SX134 design for the Korea Institute of Geoscience and Mineral Resources (KIGAM).

The vessel will be built at Hanjin Heavy Industries & Construction Co in South Korea and be 92m long and 21m wide. It will fulfil the general demands of the seismic and oceanographic research industry for operation of seismic streamer cables, seismic bottom nodes, seismic high-resolution seafloor mapping, seafloor survey and sediment sampling.

The newbuilding will function as a base for up to 30 researchers and will additionally accommodate a crew of up to 20.

Construction of *Icon of the Seas* started

Meyer Werft | Construction of Royal Caribbean International's *Icon of the Seas* has begun at Meyer Turku in Finland. The occasion was celebrated in the shipyard's plate hall with attendees including the shipbuilder's CEO, Tim Meyer, and chairman, Bernard Meyer, Royal Caribbean Group chairman and CEO, Richard Fain, and Harri Kulovaara, EVP of Maritime&Newbuilds. Royal Caribbean International's CEO and president, Michael Bayley, attended remotely.

"We made our commitment to making clean power at sea a reality – and soon the norm – when Icon Class was first announced in 2016," declared Bayley, "and we're excited to see construction underway on what will truly be a ship unlike any other."

Bernard Meyer at the traditional steel-cutting ceremony

Only some of the energy-saving features of the ship, due for delivery in 2023, have been disclosed so far. The vessel will have an air lubrication system to reduce hull resistance, and a waste heat recovery system to generate up to 3 MW of additional energy.

Car and passenger ferry conducted first sea trial

Aurora Botnia | The car and passenger ferry *Aurora Botnia* has completed its first sea trial. Built by Rauma Marine Constructions (RMC), the vessel will be operated by Wasaline on the route between the Finnish city of Vaasa and the Swedish city of Umeå.

Aurora Botnia is said to be the first car and passenger ferry in the world with a Clean Design class notation. This means that the ship has been designed and built to exceed the requirements of the MARPOL Convention for the Prevention of Pollution from Ships, the operator and builder said in a statement. "This was definitely a highlight for us, a culmination of several years of effort. We were able to meet the expectations of our work, ensuring that the ship we built can operate as intended," said Johanna Kaijo, project manager for *Aurora Botnia* at RMC. "The event was important to Wasaline, too, as we had the opportunity to get to know our new ship and its operations in marine conditions for the first time with the project's key personnel," added Peter Ståhlberg, managing director of Wasaline.

The ship's main engines operate primarily on low emission LNG. In the future, the ship can be powered by biogas.

Aurora Botnia in the archipelago during sea trials Source: RMC

Turbocharger distribution

Collaboration | MAN Energy Solutions and Rolls-Royce Power Systems have signed an agreement enabling MAN's PBST brand to distribute mtu turbochargers for high-speed gas and diesel engines.

This opens up a new sales channel for Rolls-Royce, in addition to Woodward L'Orange, and will enable PBST to expand its product portfolio, distributing the mtu range of ZR1 to ZR5 units under the series name HIRO in future.

The mtu turbochargers are suitable for engines in the 400-kW to 2,500-kW power range in single- and two-stage versions, and are available for marine, rail, construction and heavy land vehicles, as well as power supply. Dr Uwe Lauber, CEO of MAN Energy Solutions, commented: "Thanks to this product expansion, we are now able to offer our customers exactly the right turbocharger for their high-, medium- and low-speed applications under one roof via the PBST brand."

The *National Geographic Resolution* in Ulsteinvik Source: Ulstein

Cruise vessel commences final outfit

National Geographic Resolution | Lindblad Expeditions' *National Geographic Resolution* has left Ulstein's construction hall and is now berthed alongside for final outfit.

The vessel is a sister to *National Geographic Endurance*, delivered in 2020, and will be handed over to the New York-based expedition cruise line during the final quarter of this year.

Both ships are of CX104 design from Ulstein Design & Solutions AS and have the shipbuilder's distinctive X-Bow®. This is an important feature, Ulstein said in a statement, giving a powerful wave-slicing action that provides good sea-keeping in rough conditions.

With Polar Class 5 notation, the 126-passenger vessels are able to venture deep into polar waters. The *National Geographic Resolution* has extra fuel and water tanks enabling longer voyages in remote areas.

The vessel will now complete the outfitting process, with a particular focus on interior spaces, prior to the start of sea trials, Ulstein said.

› IN BRIEF

Service hub | Damen Shipyards Group has announced the expansion of its global service network with the opening a new service hub in Southampton, UK.

New laboratory | Bureau Veritas has opened a new laboratory and testing facility in Regency Park close to Port Adelaide, the hub for Australian naval shipbuilding in South Australia. The facility was officially opened by the Premier for South Australia, the Hon. Steven Marshall MP in a ceremony on May 11th 2021.

Partnership | Wärtsilä Voyage and Japan based Weathernews Inc (WNI) have signed a strategic partnership agreement. The partnership will enable the integration of WNI's weather forecasting data and Optimum Ship Routeing (OSR) service with Wärtsilä's products, increasing navigational safety and supporting the decarbonisation efforts of ship owners and operators.

Appointment / Promotion | Lloyd's Register (LR) has appointed Kevin Humphreys as its new Marine and Offshore president for the Americas, and has promoted Sung-Gu Park to president, responsible for the North East Asia region, including South Korea and Japan.

Liferaft service | Ocean Safety has introduced a high-speed priority liferaft servicing scheme for vessel owners and fleet managers who have a tight timeframe to get their liferafts serviced and returned. Liferafts can be delivered to one of the offices and collected within five to seven days.

New shop | Yara Marine Technologies has opened a new shop in Gdańsk, Poland. The new site will serve turnkey deliveries as part of the company's green tech expansion, such as shore power and WindWings, as well as onboard repairs and upgrades.

Davit supplier | Vestdavit has bolstered its presence in the European market with the launch of a new subsidiary in the Netherlands that positions it for business growth in one of the world's major maritime hubs.

Two new zero-emission fjord ferries

Illustration of the two ferries on the Stranda-Liabygda route

Fjord1 | Norwegian ferry operator, Fjord1, has signed a contract for two new zero-emission ferries, developed by HAV Design, to be built at Tersan Shipyard in Turkey. The two HAV 934 ferries, with capacity for 80 cars and 249 pasengers, will operate on two routes at the entrance to Geirangerfjord, a World Heritage site.

HAV Design has used route simulation and hull optimisation technologies at the HAV Ocean Lab to create a virtual model of the area and a digital twin of the two ferries. Using renewable energy, battery power and low energy consumption are key factors in their design.

HAV Design vice president, Sales, Lars Conradi Andersen, said: "It is particularly pleasing that our designs will now contribute to the ferry revolution in a World Heritage area whose nature requires extra protection. We know that these routes are popular with tourists during the summer season, and now visitors to the World Heritage area can cross the fjord and enjoy the scenery, undisturbed by noise and exhaust fumes."

Order for more mega-carriers

Hapag-Lloyd | Hamburg-based shipping group Hapag-Lloyd has placed an order with South Korean yard Daewoo Shipbuilding & Marine Engineering for six container ships. They will have a capacity of 23,500 TEU. The company had already placed an order for six ships of the same size at the end of 2020. The ships now ordered will be fitted with a high-pressure dual-fuel engine. They will operate on LNG, but the vessels will also have sufficient tank capacity to operate on conventional fuel as an alternative. The newbuilds are to be deployed on the Europe-Far East routes from 2024 as part of THE Alliance.

Another shore power setup in Kiel

The new shore power facility in Kiel Source: Port of Kiel

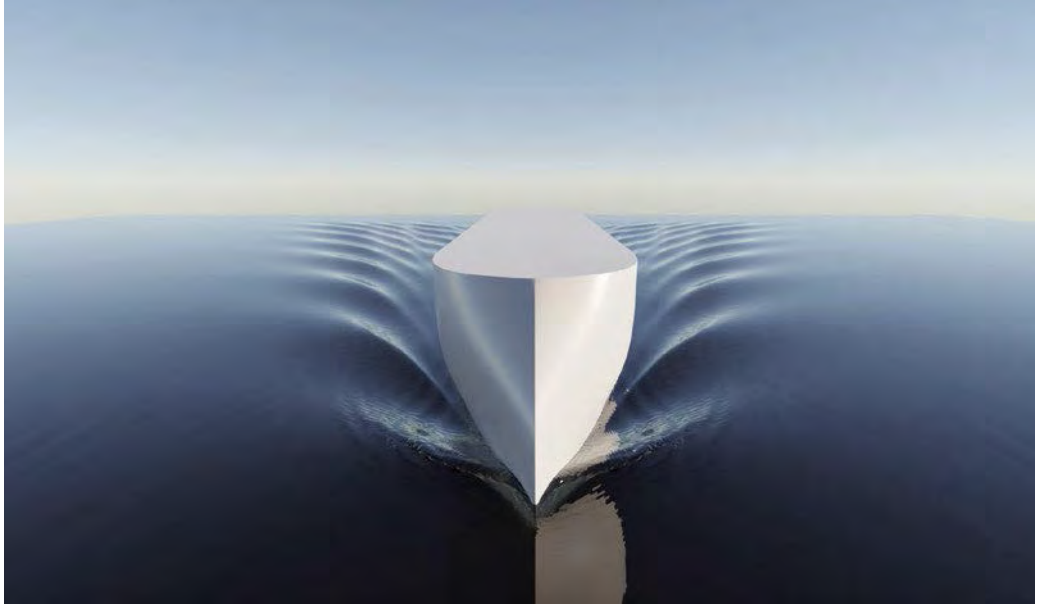
Ostseekai | The Schleswig-Holstein Port of Kiel has taken another major step on its decarbonisation journey with the inauguration of another shore power facility at its Ostseekai. The port's energy set up – with a total of 16 MW of power – now means that one cruise vessel at the Ostseekai as well as Stena Line ferries at the Schwedenkai can be supplied with shore power simultaneously. Commissioning of the Ostseekai was carried out by Dr Bernd Buchholz, the state of Schleswig-Holstein's Minister of Economics, Transport, Labour and Technology and Tourism, and Kiel's Lord Mayor, Dr Ulf Kämpfer. AIDA Cruises' *AIDAsol* then became the first cruise ship to connect to the new shore power system. The EUR 13.5 million facility was supported by the state of Schleswig Holstein, which provided funding of EUR 9 million. The shore power plant has been supplying Stena Line ferries with climate-neutral hydropower since the start of this year, clocking up savings in annual CO_2 emissions of about 5,000 tonnes. Color Line ferries, meanwhile, which dock at the port's Norwegenkai, have been using shore power since May 2019, saving a further 3,000 tonnes of CO_2 emissions each year. And now, for every cruise ship call at the Ostseekai, there will be an average CO_2 saving of about 45 tonnes.

Hydrogen-ready CSOV launched

Gondan | A hydrogen-ready commissioning service operation vessel (CSOV) being built at the Spanish shipyard, Gondan, in Figueras has just been launched. Under construction for Norway's Edda Wind AS, the CSOV is the fourteenth ship built for companies related to the Østensjø Group and is the first of four CSOVs on order at Gondan.

With funding support from Enova SF, a Norwegian state enterprise backing sustainable investments, the 88.3m-long *Edda Breeze* is being built to a Salt Ship Design and is ready for the installation of zero-emission hydrogen technology in the future. The CSOV has accommodation for 93 technicians and 27 crew and will support operations at the *BardOffshore 1* wind farm in Germany, owned by Ocean Breeze. The ship will have a 3D-motion compensated crane and a motion-compensated gangway with a maximum range of 28m, and an integrated elevator for 26 persons.

Launch of the CSOV *Edda Breeze* Source: Gondan



Artist's impression of the container ship design Source: Ulstein

Container ships without fossil fuel propulsion

Design | Edge Navigation AS, an Oslo-based start-up aiming to develop commercial ships without fossil fuel propulsion, has chosen Ulstein Design & Solutions for the design of a new container vessel with the company's distinctive X-Bow®. Jakob Tolstrup-Møller, Edge Navigation managing director, explained: "The energy transition will force a paradigm shift in the maritime industry as shippers / cargo owners look to eliminate emissions. Ulstein's commercial director, Lars Ståle Skoge, commented: "This assignment is an ideal project for Ulstein. One of our core values is sustainable growth, and in this project, we develop further the design of container vessels, for example, by using non-fossil fuel propulsion as well as the energy-efficient X-Bow hull design to achieve the goal of green maritime transport."

Erma First buys RWO

Ballast water technology | Erma First, a Greek ballast water equipment manufacturer, has acquired German marine water specialist, RWO GmbH. The Bremen-based company, established in 1975, supplies a range of water treatment systems for ships, ports and offshore installations, and has supplied more than 16,000 oily water separators to ships over the years.

Erma First managing director, Konstantinos Stampedakis, said: "This is a win for Erma First and a win for RWO's customers and staff. We have acquired a world leader in water treatment systems for the shipping industry with a strong customer base and a reputation for excellence and reliability. We ourselves have a track record of innovation with our ballast water technologies and are well-known for our high-quality engineering and customer-first ethos."

Illustration of the *Medstraum* Source: Kolumbus/NCE Maritime Cleantech

Construction of first, fast, zero-emission ferry starts in Norway

Medstraum | A zero-emission, twin-hulled fast ferry is now under construction at Fjellstrand Shipyard in Norway. The 31m-long catamaran, *Medstraum*, has capacity for 150 passengers and will be equipped with two electric motors and a 1.5-MWh capacity battery with charging power of more than 2 MW.

Partners in the Transport – Advanced and Modular (TrAM) project, which aims to simplify ferry construction through modular design and production, claim that the vessel will be the world's first fully-electric and zero-emission fast ferry classed in accordance with the International Code of Safety for High-Speed Craft.

The *Medstraum*, the project's demonstrator vessel, is due to start a trial passenger service next spring. The ferry will have a service speed of 23 knots. The vessel's design has been optimised in various sustainable aspects. Apart from its sources of renewable power, good hydrodynamic performance has been a priority and its alumunium construction results in less weight and easier recycling.

› IN BRIEF

New managing director | German shipping and logistics group Harren & Partner is strengthening its management team with Nils Aden who joined the group as Managing Director on May 1st 2021.

Name change | As part of its continuous efforts to solidify and strengthen its position in Argentina and to promote further the Svitzer brand name, global towage provider Svitzer has changed its company name in Argentina from Madero Amarres SA to Svitzer Argentina SAU.

Digitalisation | Nautilus Labs and Datum Electronics have announced a partnership that will provide shipowners, operators, technical managers, and charterers with a comprehensive setup for vessel digitalisation and predictive decision support.

New subsidiary | Maritime data analytics specialist Metis Cyberspace Technology has opened a fully owned subsidiary in Vancouver, Canada, to enhance its service to local customers and generate new business throughout North America.

Certification | OneOcean has announced that its digital logbook solution, LogCentral, has now been officially certified by Lloyd's Register.

New location | HullWiper Ltd has launched its first operation in South Korea. Through a partnership with HullWiper Korea, a company based at the Korea Maritime and Ocean University in Busan, it will provide green, sustainable and affordable hull cleaning solutions to all vessel types calling at the country's main ports.

Biofuels | GoodFuels and Norwegian environmental non-profit organisation ZERO have today announced a partnership aimed at enhancing sustainability within the maritime supply chain. Under the partnership, the organisations will work together to accelerate the shift to a renewable transport sector, with a special focus on sustainable biofuels for the maritime industry. As one of the means of achieving this dynamic shift, they will collaborate on establishing framework conditions for sustainable biofuels in the Nordics.

Green innovation in China's maritime industry

China Classification Society is focusing on green technology in the maritime industry Source: CCS

CCS China has committed to making the 2020s its decade of peak CO_2 emissions, before reducing them to zero, or zero-equivalent, by 2060. This is a formidable ambition for the world's capital of manufacturing; but the good news is that China is in position to harness a huge amount of renewable energy over the coming decades. China Classification Society (CCS), as well as other organisations, are pioneering research and innovation into the use of alternative fuels and harnessing green energy in the world's biggest maritime nation.

China has vast potential for both on- and offshore wind energy, amounting to around 3,500 TWh. If harnessed, this would have been enough to provide about half of China's power demand in 2019. Over the course of 2020, a year beset by the worst industrial slowdowns from Covid-19, China still managed to add 100 GW of wind energy capacity, equivalent to more than double the entire power consumption of the UK.

Wind energy is likely, therefore, to be the biggest area of renewable growth in China in the coming decades. But, as elsewhere, it requires an important prerequisite – a solution to the problem of intermittency. That is, the fluctuations in wind power which cannot be easily matched by ramping-up-and-down of other sources.

Offsetting the cost of new turbines with supplementary energy generation processes, however, operated at times of surplus, will enable China to make the best use of its extraordinary natural resources, and, like many countries, it is coming to recognise the role of maritime as a suitable vector for this change, through the medium of hydrogen.

Alongside e-fuels like methanol and ammonia, hydrogen can be used as a storage medium – akin to a fluid battery – for surplus renewable energy. Used in ships, hydrogen could become a mutually beneficial enabler for surplus wind power energy while also replacing heavy polluting fossil fuels.

"The Chinese Government has established a long-term goal to become a carbon neutral country by 2060," said Jia Siqing,

general manager of Industrial Products for CCS Wuhan branch. "We must also reach the peak of carbon emissions before 2030. As the marine industry is one of the major sources of these emissions, it must make its share of the contribution to this inspiring target."

A hydrogen economy

Hydrogen can be produced in various ways. Currently, almost all hydrogen is produced via steam-reforming, a complex process using fossil fuels as a feedstock, and generating considerable CO_2 emissions. But hydrogen can also be produced using renewable energy. In fact, when renewable electricity is applied to the manufacturing of hydrogen through electrolysis, it can achieve an efficiency of around 50%.

Hydrogen (H_2) is a handy fuel, generating only water, or water vapour, as an exhaust product. One of its most intriguing aspects is that it can be used in fuel cells, an immature but still promising technology. As it stands, alkaline fuel cells, the most efficient existing today, are capable of 60% efficiency – in other words, almost double what can be achieved with a conventional internal combustion engine (ICE). Making use of waste heat from the reaction, the efficiency rises to 87%.

Though CCS is exerting considerable effort into making fuel cells viable in the maritime sphere, there are hurdles to overcome. Vibration, extremes of temperature, the tilting and swinging motions associated with ships, as well as damp – these factors will have to be rigorously tested. In 2015, CCS published its 'Guidelines for Application of Fuel Cell System'. This was followed, this year, with a type-approval for Wuhan-based Troowin Power System Technology Co., a manufacturer of marine fuel cells.

CCS' next project comprises tests on a 2,100dwt bulk carrier, which will sail along the Pearl River, in Guangdong province, with four 130-kWh fuel cells. In this application, the vessel will be in a position to bunker hydrogen regularly, and so will not require huge storage capacity. But, in order to be usable for deepsea shipping, the maritime industry will almost certainly have to find a way to store vast quantities of hydrogen in a small space.

"Since hydrogen is the lightest natural element, more space is needed to store it," Siqing said. "We are looking at methods to create hydrogen at sea, such as the use of methanol or ammonia, which can be transported easily and cheaply."

Methanol can be manufactured using a method which combines renewably generated hydrogen with captured and repurposed CO_2, to make a fuel which is relatively energy-dense, liquid at room temperature, and as non-toxic as conventional marine diesel.

Meanwhile ammonia (NH_3) acts as another hydrogen storage medium, by combining it with nitrogen. It can be stored at −33.34°C, a much easier process than liquid hydrogen, which requires -252.87^{0}C.

However, for the time being, Siqing said, "Our main focus of our work is carrying enough bulk hydrogen for an entire voyage. We think liquid hydrogen would be a good contender for this. In the meantime, high-pressure gas cylinders would be a reasonable solution for small and short-voyage vessels."

Internet of Things

The Internet of Things will bring huge benefits for efficient ship operation. The traditional single, massive drivetrain – that is, an HFO-fired engine the size of a large building, driving a single enormous propeller – that shipping has come to rely on, is likely to give way to a distributed, electrical propulsion system. Many systems will feed power into this network – fuel cells, batteries, and possibly renewable energy sources such as wind and solar – and each will be electronically controlled, communicating with the other components automatically, and dynamically altering loads in a way that is more akin to a power grid than a drivetrain.

But this communication will be external as well, and the implications of this are no less beneficial. With a new ability to record vast amounts of operational data from vessels, this can be leveraged to gain key – and actionable – insights.

However, one challenge is that without expert input, it is difficult to look at raw data and generate beneficial findings every time. The expertise for this is difficult to come by, and not all shipping companies are lucky enough to have it available in-house; however, sharing this data with third parties can be a gamble.

In August last year, CCS sought to address this issue with the China Ship/Shipping Blockchain (CSBC), a new means for owners to share their data with trusted parties. The measure will enable extraordinary efficiency gains, without opening companies up to the possibility of ransomware and corporate espionage.

Batteries

CCS is also examining the potential of battery power. While the general consensus is that lithium-ion batteries lack the energy density to support deepsea shipping, many vessel types will be able to make use of them for other means. This is because of a battery-electric propulsion system's ability to ramp up and down at a moment's notice, versus long spin-up times for conventional ICEs.

Where this comes in handy is in settings where rapid changes in propulsion demand would otherwise cause massive inefficiencies in ship operation as engine RPM tries to compensate – such as in tugs, icebreaking vessels, and offshore vessels. In these cases, batteries can perform the same function as hydrogen does for power grids – load-levelling; the ability to take in power at times of surplus, and discharge at times of high demand. Operating in this way, a vessel's engine can run near-constantly at its most efficient level, while the battery charges and discharges to match propulsion demand.

Another possible application of battery propulsion could be important in meeting with one of China's biggest pieces of maritime legislation – the three ECAs in the Pearl River Delta, the Yangtze River Delta and Bohai Bay. From 2022, the cap will be 0.10% in some areas, versus 0.5% for the global IMO Sulphur Cap which entered into force in 2020.

With the help of energy storage systems, vessels could operate on full-electric power during their time in coastal waters. It would also be possible to recharge them in port, using one of China's many shore power facilities.

Following detailed studies, CCS has proposed a multi-level strategy for battery safety, which incorporates layers of protection for individual cells, for modules, for battery cabinets, and battery compartments. The first three levels of protection give priority to preventive measures before any potential accident, while the fourth level gives priority to containing the results of an accident.

Shifting the model for ship propulsion from ICEs to electric motors powered by batteries – or hydrogen fuel cells – will afford much more granular control of the ways vessels operate is likely to lead to substantial fuel savings, CCS says. Automated control of propulsion systems will come to be seen as the only way to compensate for these moment-to-moment changes, however. This is why digitalisation, automation, and cyber security must develop in parallel.

Liquid hydrogen membrane containment system awarded AiP

ICT | Classification society DNV has issued an Approval in Principle (AiP) to IC Technology (ICT) for its new liquid hydrogen membrane-type containment system. The award is significant because liquid hydrogen is likely to have a broad range of applications across many industries and could become a marine fuel of the future, as global shipping pursues its decarbonisation drive.

The system comprises two stainless steel membranes and two vacuum insulation layers, separated by a secondary barrier. The primary membrane is based on patented technology that uses helium for cooling. The vacuum insulation provides effective thermal insulation, enabling detection and handling of any hydrogen leaks, as well as air leaks through the supporting structure and into the secondary insulation space.

The ICT liquid hydrogen containment system

Source: ICT

The entire system has been evaluated by DNV in line with the IMO Interim Recommendations for Carriage of Liquefied Hydrogen in Bulk, as well as the International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code) and DNV's Rules for the Classification of Ships Part 5, Chapter 7. However, the carriage of hydrogen in bulk is not yet specifically covered by international maritime regulations or class rules and therefore the acceptance of storage containment systems for liquid hydrogen will be subject to individual flag state approval.

ICT's founder and CTO, Otto Skovholt, commented: "We are very excited to have been awarded this AiP from DNV. This is an important milestone in realising our technology for liquid hydrogen storage and distribution, which will have a wide range of applications for a number of industries – and in particular for the maritime industry to realise large-scale liquid hydrogen carriers."

Johan Petter Tutturen, DNV's business director, Gas Carriers, said: "Hydrogen as an energy carrier and a fuel is potentially one of the foundations of the energy transition. As such, it is essential that industry is able to pursue the enabling technologies safely and with confidence. An AiP can help build this confidence, by demonstrating that new solutions have been assessed based on long-standing, trusted and independent standards."

Classification society boosts innovation endorsement capability

ESG DEVELOPMENT | As companies set about strengthening their environmental, social, governance (ESG) credentials and sustainable development goals (SDG), classification society ClassNK has expanded its Innovation Endorsement programme, a third-party certification service designed to endorse innovative technologies and initiatives. Areas in which the classification society is now supporting innovation include the environment, safety, labour, as well as digital services. Recent initiatives include revisions to its Guidelines for Digital Smart Ships and its Environmental Guidelines. ClassNK launched its Innovation Endorsement programme in July 2020. Since then, it has issued Digital Smart Ship notations for 70 ships and certified four systems. However, recognising that innovative technologies embrace a number of sectors, not just digital, the classification society has introduced the three new categories of environment, safety and labour as part of the expansion initiative.

"Industry's feedback on Innovation Endorsement has been positive, and we are on the right path to provide the third-party certification for innovative technologies and initiatives," said Dr Toshiro Arima, ClassNK's Corporate Officer and general manager of its Digital Transformation Center. "I am glad to have expanded the scope of Innovation Endorsement to serve the industry and society better.

"The revised guidelines have further streamlined the scheme to certify the ships with digital and environmental innovations," he continued. "We are now working on developing class notations related to the innovations on safety and labour as well as on strengthening verification methodology for products and solutions, and providers. ClassNK continues striving for supporting innovations with its expertise and collaboration with front-runners."

Industry partners to assist in carbon compliance

EEXI/CII | Classification society Bureau Veritas (BV), shipbroker Barry Rogliano Salles (BRS), and ship design firm, Deltamarin, are to work together to assist owners in measuring, verifying, and improving carbon performance. The partners will work with owners on specific targets, such as the energy efficiency existing ship index (EEXI) and the carbon intensity indicator (CII), but also on other operational and retrofit options for raising environmental social governance performance more generally.

In a statement, the companies said that by uniting their respective strengths, the agreement will enable shipowners to find a pathway through the uncertainties of compliance with new and existing EEXI and CII emissions regulations as well as their own and their stakeholders' ambitions to meet both emissions and financial performance targets.

One priority will be to assess the operational and retrofit options for existing vessels, including engine power limitation, propulsion optimisation, energy saving devices, new fuels, wind propulsion, and other possibilities. Deltamarin will focus on engineering aspects, BV on verification, risk and compliance, and BR on commercial aspects including working with shipyards on modifications and retrofits, and then on carbon credits and market-related issues.

Representatives of the three partners all commented on the development. BV's president, Marine & Offshore, Matthieu de Tugny, said: "We need to do more than just calculate the EEXI and CII requirements. We need to find, verify and market the benefit of solutions to help shipowners meet their performance targets."

Deltamarin CEO, Janne Uotila, stressed that the future is not only about complying with the upcoming design and operational indices, but also about finding a transition pathway towards low and eventually zero carbon shipping. He said that the partnership will enable all aspects of this complex equation to be addressed.

With the EEXI and the CCI regulations now adopted, owners will have to assess the performance of their vessels Source: Stock image

BRS president, Francois Cadiou, added: "This commercial agreement will permit our clients to make better-informed decisions and comply with the regulations set out by the IMO. Ultimately, this will help move shipping towards a more sustainable future."

New online platform

In order to assist owners in assessing their compliance with EEXI and CII regulations, BV has also introduced the online platform VeriSTAR Green. Commenting on the launch, Laurent Leblanc, senior vice president Technical & Operations for BV Marine & Offshore, said: "The regulation will enter into force in 2023. Until then, shipowners will need to pre-assess their compliance to get ready for the 2023 deadline. I am proud that Bureau Veritas Marine & Offshore and Bureau Veritas Solutions M&O have joined forces to open this dedicated online platform to help the industry tackle the EEXI and CII challenges in time to reach compliance."

Wärtsilä and RINA present new propulsion arrangement

The new design is based on a single engine for both propulsion and electric power generation

Source: Wärtsilä Corporation

EFFICIENT ALTERNATIVE | Technology group Wärtsilä and classification society RINA have announced a new propulsion arrangement which, they say, offers full redundancy, less machinery, lower capital expenditure, reduced operational complexity, and optimised fuel consumption.

According to the project partners, the new concept changes traditional ship design thinking and offers a highly efficient, future-proof alternative.

The conventional approach in ship design has been to use two-stroke engines for propulsion and four-stroke engines for electric power generation, the companies noted. The Wärtsilä / RINA arrangement, however, requires two four-stroke dual-fuel (DF) engines, with options for electric power back-up from batteries or a small DF generator when the ship is idle. The design can achieve a reduction of up to 50% from the Energy Efficiency Design Index (EEDI) reference level value, and immediate compliance with the IMO's 2030 targets, Wärtsilä and RINA said in a joint statement. The arrangement features Wärtsilä 31DF engines operating with LNG fuel.

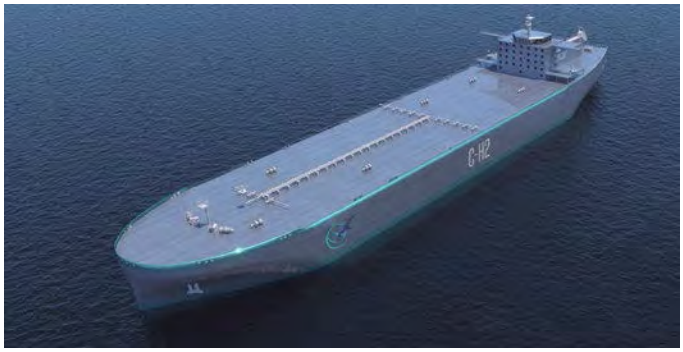
At current shipping speeds, the system performance of the new arrangement provides at least the same, or better efficiency than an equivalent two-stroke design, the companies claim. At slower speeds, it has the potential to reduce fuel consumption and emission levels even further. Overall, the arrangement is as easy and less costly than traditional two-stroke propulsion systems. Both Wärtsilä and RINA emphasise sustainability in their strategies and values, with a common desire to optimise the technological and operational aspects of the marine industry.

New joint venture on compressed hydrogen development

MoU | Technology group Wärtsilä and Australia's Global Energy Ventures (GEV) are to work together on delivering compressed hydrogen as an energy source to regional markets, as well as a possible carbon-free fuel for ships.

The two companies have signed a Memorandum of Understanding (MoU) to advance GEV's Approval in Principle application for a new 430-tonne compressed hydrogen (C-H2) vessel and potential use of hydrogen in Wärtsilä propulsion systems.

Speaking on behalf of GEV, chief executive Martin Carolan said: "We look forward to working closely with Wärtsilä on this project. We have shown that [compressed hydrogen] shipping is ideally suited for exporting green hydrogen with a lower delivered cost, and having a technology leader such as Wärtsilä with us, we can deliver a shipping solution that is completely sustainable."



Wärtsilä will collaborate with GEV to assess propulsion systems for GEV's new 430-tonne C-H2 vessel Source: Global Energy Ventures

Wärtsilä Marine Power sales director, Petteri Saares, said: "This project is an important stepping stone along the journey towards a decarbonised maritime industry, something that Wärtsilä is fully committed to supporting. We are actively developing propulsion alternatives that can utilise future carbon-neutral fuels, raise efficiency levels, and which significantly improve environmental performance. This agreement with GEV is fully in line with our own ambitions."

Dutch partners develop new thrusters for Waterbus service

AZIMUTH TECHNOLOGY | A new 360° azimuth thruster has been developed by a group of Dutch companies to propel and manoeuvre fast inter-city passenger ferries operating between Rotterdam and the three Drecht cities of Dordrecht, Papendrecht and Zwijndredcht.

Blue Amigo, a ferry operator and inland shipping specialist, placed an order for nine passenger vessels with Damen Shipyards Group in 2020. Six of the carbon-fibre vessels are to be deployed on the Waterbus service, a fast inter-city service requiring a combination of speed and manoeuvrability.

So the shipbuilder approached Rotterdam-based thruster propulsion specialist, Hydromaster, which has units in operation on ferries, ships, barges, and pontoons all over the world. The thruster company, meanwhile, had already developed an azimuth thruster that was potentially suitable. It had taken its design to the Maritime Research Institute of the Netherlands (MARIN) for hydrodynamic tests and a computational fluid dynamics study for fine-tuning the design.

Jan Terlouw, commercial manager at Hydromaster, explained: "We had already been working on something that would meet these [Damen's] requirements. A 375-kW thruster, able to operate at speeds of up to and beyond 25 knots and durable enough to cover over 4,000 hours each year. But we had never built it. Once Damen signed its contract with Blue Amigo, we got the green light to go ahead."

MARIN's project manager, Jesse Slot, noted the challenge of striking the right balance between speed, vibration and efficiency. However, after assessing Damen's hull design, the MARIN experts decided on an azimuthing unit with a propeller of 840mm diameter and hull clearance of 23% of diameter. Damen, meanwhile, had developed its own single joystick controller that is claimed to be intuitive to use.

The result has been success for all parties. Damen's ferry design and proposal engineer, Jan van Ooijen, commented: "This is a compact installation that takes the concept of standardised shipbuilding and applies it on another level. The result maximises the performance of the vessel and offers the reliability required for a ferry service. We can see a future for this type of thruster."

Hydromaster's Jan Terlouw shares the same view. "We have already started to extend this range of High Speed Azimuth thrusters with a higher power output towards the 900-kW mark. We see a good potential for this type of thruster, not only for fast ferries, but also for example on crew transfer vessels for the offshore wind sector, supporting the production of sustainable energy, and other fast craft."

Damen und Hydromaster have developed a new ferry thruster for Blue Amigo Source: Damen

The Oceanbird concept was presented by Wallenius in September 2020 Source: Wallenius

Joint venture to develop modern wind propulsion

ALFAWALL OCEANBIRD | With the aim of radically reducing the marine industry's carbon footprint and overall emissions, Alfa Laval and Wallenius have announced their intention to form a new 50/50 joint venture. AlfaWall Oceanbird will focus on the development and realisation of technology for fully wind-powered vessel propulsion.

Alfa Laval and Wallenius are familiar partners in developing ground-breaking technology. The companies have collaborated previously on PureBallast, which is one of today's leading systems for ballast water treatment. Through AlfaWall Oceanbird, they will pursue an innovative means of wind propulsion based on telescopic wing sails. This joint venture could reduce emissions by 90% on the largest ocean-going vessels, the partners said in a statement.

"Wind has a key role to play in decarbonising the marine industry," said Peter Nielsen, business unit president, Alfa Laval Marine Division. "Together with Wallenius, we will harness this abundant natural force to meet both climate needs and those of maritime business."

"Oceanbird wing sail technology will be not only an elegant solution, but also a powerful driver of positive change," added Per Tunell, COO Wallenius Marine and future managing director of AlfaWall Oceanbird. "Our vision at Wallenius is to lead the way towards truly sustainable shipping, and we are proud to partner with Alfa Laval in reaching it."

The Oceanbird technology comprises an array of rigid wing sails, built from steel and composite materials, that generate forward thrust instead of vertical lift. These wing sails will be able to turn through 360° to make optimal use of the wind.

The technology will be valid for any vessel type, but it will be implemented first on a trans-Atlantic car carrier. With capacity for 7,000 cars, the 200m-long vessel will cross the Atlantic in twelve days when sailing at an average speed of ten knots. AlfaWall Oceanbird will focus primarily on the vessel's technical sailing aspects, such as the vessel control system that will steer the wing sail operation.

"The wing sails are up to 80m tall and have a telescopic construction," said Nielsen. "Besides adjusting to catch the wind, they can be lowered to pass under bridges, to handle harsh weather conditions or for maintenance. Because they will interact with the hull in a sophisticated way, they will also require intelligent control."

"We cannot wait until the end of the century to phase out fossil fuels," added Tunell. "We must create realistic alternatives, including the infrastructure for delivering and supporting them. Wallenius is committed to wind propulsion, and we know from the experience with PureBallast that Alfa Laval can help us make it a global reality."

New tanker already meets 2050 targets, owner claims

The *Fure Viten* is expected to run mostly on liquid biogas

DUAL-FUEL | A 17,999dwt tanker that recently left China Merchants Jinling Shipyard in Yangzhou, already meets the IMO's emissions target for 2050, according to Donsö Island-based tanker owner and operator, Furetank. The family-owned company's *Fure Viten* is a dual-fuel, gas-powered vessel with twelve cargo tanks that will initially operate on LNG and liquid biogas (LBG).

However, company CEO Lars Höglund hopes that the *Fure Viten* and other tankers in the class will operate on LBG most of the time. "My view is that in 2030, we will run these vessels largely on LBG with zero fossil emissions," he said.

The result of collaboration with FKAB Marine Design and Wärtsilä, the tanker is one of a series of eight ships, each with cargo capacity of 20,300m^3. The *Fure Viten* has a unique combination of fuel-saving systems, the company said, that has enabled it to notch up an energy efficiency design index (EEDI) value of 4.65. This compares with an IMO requirement for vessels of this type and size of EEDI 9.37. It is the best result achieved so far for tankers of this type, Furetank said.

"We will operate the ships we build now for the coming 20 years," declared Höglund, "so we have put a lot of effort into investigating what is the best possible technology that we can invest in today. Climate change is a reality, and we believe that politicians mean what they say. Thus, if we are to survive as a shipping company in the future, we must do our absolute best to reduce our climate and environmental impact.

"We have developed ships since the 1980s and used our experience to optimise every detail," he continued. "There is not a single system that we haven't improved. This combination of interacting, energy-saving technical solutions is unique."

The tanker's features include batteries to limit auxiliary engine use, a ducted propeller for more thrust and less power, and optimised hull lines to minimise drag. The main engine and shaft generator use variable frequency to increase propeller efficiency and cut fuel consumption.

Meanwhile, both the *Fure Viten* and its preceding sister vessel, *Fure Vinga*, are equipped with 6.6-kV high-voltage shore power cargo pumps which can be used in ports that have such arrangements. Developed in collaboration with the ports of Gothenburg and Rotterdam, shore power is set to play an important role in the decarbonisation process – up to 20% of tanker emissions, for example, can be generated in port, often in locations that are more sensitive to pollution and noise than at sea.

These design features have resulted in a CO_2 emission reduction of 55%, Furetank estimates, compared with older vessels of this type. Eutrophic NOx has been cut by 86% while SOx and particulates have been completely eliminated. Höglund revealed that the company is in the process of securing the supply of large volumes of biogas, probably within the next year or so, through an exclusive supply agreement. From that time, the tanker will then operate mostly on biogas.

The ice-class 1A *Fure Viten* will fly the Swedish flag and, at the end of June, was on its maiden voyage from China to Europe.

Project aims to quantify likely benefits of wind propulsion

WiSP2 | Dutch maritime research institute, MARIN, and classification society, ABS, have launched a joint industry project, WiSP2, to assist owners and operators in the assessment of potential efficiency gains from wind propulsion. The WiSP2 project will follow on from the first WiSP project, focusing on making evaluations within EEDI and EEXI, but also from real-life operating conditions.

"These new findings from WiSP2 will be condensed in updated recommended methods for performance prediction and reported as submissions to MEPC and potentially other committees in IMO," explained Jan Otto de Kat, ABS' director, Global Sustainability Center, Copenhagen.

The aim is to provide a forecast of what ship operators can expect, enabling them to make better investment decisions. Compliance to rules and regulations will also be addressed, specifically on manoeuvring, the partners said.

The scope of the two-year project is as follows:

- Improve methods for transparent performance prediction, extending the considered wind propulsors and propulsion line types compared to the previous WiSP project;
- Apply the new methods in cases, including a validation case;
- Conduct a further review of the regulatory perspective, recommend improvements and clarifications, and provide examples to establish compliance;
- Development of a basic performance prediction tool, to be used by participants;
- Proposal for in-service speed trials with wind-assist technologies;
- Assess the influence of manoeuvring compliance and course-keeping.

Gavin Allwright, secretary general of the International Windship Association, said: "A project that will culminate in a set of recommendations and a software tool to prepare exploratory performance predictions for wind propulsion systems is another important step forward for the sector."

MARIN initiated the second project, together with ABS. However, the project is open for additional participants who could benefit from a reduced entry fee if they join by August 1st 2021.

Wear-resistant materials for long service lives

ELASTOMERIC PROTECTIVE COATINGS Germany's MetaLine Surface Protection GmbH sees long-term protection of marine equipment as the best economic solution for high operational safety

In terms of protection against wear caused by cavitation, erosion and abrasion, there are two physical schemes available: energy reflection and energy absorption.

The former is achievable through very hard surfaces, such as those that use plasma treatment and manganese steel, Hardox™, tungsten carbide and similar alloys. Elastic substrates absorb, store and release the energy when the energetic impact ends. When MetaLine Surface Protection GmbH introduced a range of elastomeric repair and protective coatings, it opted for energy absorption.

Peter Schramm, MetaLine´s managing director, explained: "Thirty years ago we began developing a material that incorporates the primary technical characteristics of completely different materials. The application process is as straightforward as with an epoxy-ceramic composite, but the compound itself functions like rubber, and ultimately possesses erosion qualities equal or greater than duplex steel (AISI316). The result is a hydrodynamic-resistant, castable, and sprayable protective coating that provides unparalleled erosion/cavitation resistance."

The fundamental step was based on experience and knowledge from the epoxy ceramics business. While MetaLine covers the market with only three products, epoxy ceramic suppliers exchange their fillers creating numerous of similar compounds with identical limitations. The epoxy binder is not hard enough to become wear resistant by energy deflection and not soft enough for energy absorption.

The most important maritime applications of epoxy ceramics are the rebuilding of worn surfaces, which are then coated with a protective layer, and quick repairs as an emergency measure until a more permanent arrangement can be used.

The market demands more wear-resistant materials for professional applications with long service lives. The continous development of ultra-wear-resistant elastomeric protective coatings has led to today's MetaLine Series 700 supplied in three different degrees of hardness:

- MetaLine 760 (60 Shore A) serves to repair soft rubber linings and worn fenders as well as optimising the performance of hatchcover seals;
- MetaLine 785 (85 Shore A) is the first choice for the protection of components subjected to erosion, cavitation, corrosion and wear: rudder blades and horns, kort nozzles, seawater-/scrubber pipes, strainers, BWT reactors and installations, heat exchangers, pump impellers and casings, thrusters, jet propulsion drives, ropes, fenders, floating hoses etc;
- MetaLine 795 (95 Shore A) develops non-stick properties. It offers an ultra-low coefficient of static friction improving material and fouling release. It can be used for cargo gates, off-loading chutes, and hopper and bunker installations.

One of the key safety-relevant aspects of ship operation is manoeuvrability. Protective coating contributes to safety.

The high-revving propeller carries a huge flow of water, which leaves cavitation and erosion marks, especially on the suction-side edge and on the supports of the nozzle

The use of highly functional coatings requires competent surface preparation. The surfaces to be coated should be dry, clean, free of grease and salt and require a rough blasted surface profile.

Metal substrates are coated with MetaLine 924. This electrochemically active corrosion protection prevents borderline penetration on coating edges and protects damaged areas from rusting. After drying,

a double coat of MetaLine 900 Universal Primer on solid surfaces or MetaLine 910 on rubber surfaces is applied.

Finally, MetaLine Series 700 protective coating with required film thickness and colour is sprayed on. For the purpose of visual wear control indication, the coating can be executed with colour changes during application. MetaLine Series 700 can be recoated and repaired at any time. MetaLine Series 700 adheres to various substrates including steel, alloys, aluminium, rubber, concrete, wood and different plastics. The coating thickness ranges between 1 mm and 20 mm and can be achieved on vertical surfaces without material sagging. It is suitable for use in many climatic conditions, such as in zones with extremely high humidity.

The solvent-free, two-component elastomer can be applied by spraying, injecting or casting by a low-pressure cartridge applicator (about 5 bar). After five minutes, the coating is dry to touch and most parts can go back in service after 24 hours at 20°C. The temperature resistance is between -50°C and 120°C, depending on the relevant application.

The coating cures without any shrinkage or swelling. In addition to its chemical bonding process, a mechanical memory effect is developed. This permanently ties the coating to the substrate, thus counteracting any separation tendency that is normally associated with conventional rubber sheets. With strict adherence to all processing steps, an adhesion/bond strength of at least 15 N/mm² (2,175 psi) is achieved.

The low-pressure spray mode creates an extraordinarily smooth surface, improving any fluid-flow dynamic. Efficiency increases of up to 3.5% have been proven.

The MetaLine technology allows seamless coating of the most complicated surface shapes. This is a clear advantage compared with rubber linings. While straight pipes are rubber-coated with a pulled-in hose and subsequent pigging, rubber-coating of branched pipes and pipe bends is not practical. Here, with or without vulcanisation on site, rubber would always be installed as a trimmed sheet by gluing and vulcanising.

Seams and edges are a current challenge and source of functional problems. On curved parts, due to the bending of the plates, a certain surface tension builds up automatically; on the inner radius it is compressed, on the outer radius – tensile. MetaLine Series 700 polymerises, is therefore free of any tension and applicable to geometries impossible to reach by conventional rubber lining. A kind of skin covers the part and forms at higher layer thicknesses a self-supporting shape – for example as a pipe-in-pipe.

With a density of 1.05 g/cm³, it is the most lightweight duroplastic wear protection available, the company said. The material has practically no influence on the dynamic behaviour of moving parts. The dynamic abrasion of 55mm³ according to DIN ISO 4649 represents the lowest value among competing protective coatings.

According to MetaLine, the material is also characterised by the following:

- Non-toxic, safe to use and assessed by US and EU authorities as drug and food-safe according to FDA standards and relevant EEC regulations;
- Certified for rudders on ultra-fast operating defense vessels;
- Free of any metal impurities and absolutely non-corroding;
- Approved up to 700m of diving depth in saltwater;
- Structural born noise / sound reduction of up to 5 dB(A);
- 55% vibration damping at a coating thickness of 4 mm;
- Hydraulic and pneumatic pressure resistant up to 70 bars;
- Capable of handling up to 60% of solids in slurry applications.

The classification societies Lloyd's Register and ABS have confirmed that no specific class approval is needed for MetaLine.

MetaLine Series 700 has been used in civil and military shipping since 2012. A wide variety of marine equipment has been repaired or protected using MetaLine´s elastomer materials on more than 500 ships.

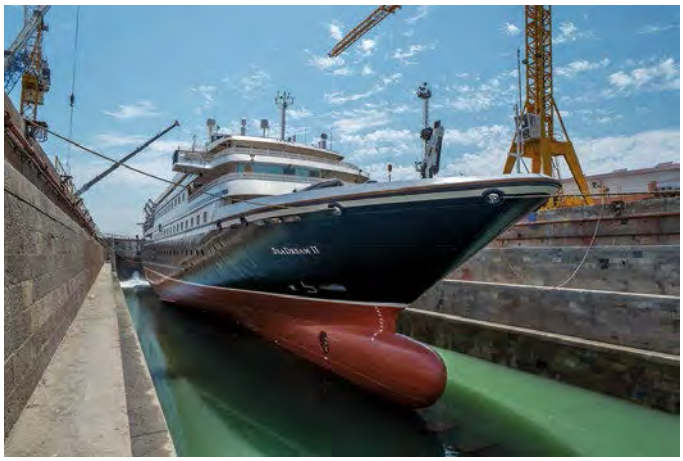
Schramm commented: "Based on our experience in application and in cooperation with customers, we can confidently claim that we have a proven product range for maritime applications. We offer technical support through all communication channels. And most importantly, we have staff and partners experienced in application and in drydock work, ready to contribute to the safety of the vessels in almost any place in the world."

MetaLine-protected strainer after five years of operation

Seawater pipe before repair and coating and five years later. Only rust particles from unprotected areas have settled.

Due to its liquid spray application, MetaLine 785 can be installed into every possible shape – impossible with rubber

Portuguese repair yard reports robust performance



The *SeaDream II* was the first job in the cruise sector in 2021

Aerial view of the repair yard

Source for both photos: Navalrocha Shipyard

NAVALROCHA SHIPYARD | A shiprepair facility located in Tagus Bay, near Lisbon, Portugal, Navalrocha Shipyard has reported a robust performance through the Covid-19 pandemic and has a steady pipeline of work through to 2024.

The first six months of 2021 have involved a series of standout drydock projects – involving general cargo vessels, tugs, passenger ferries, bunker tankers, RoPax vessels, LPG carriers and cruise vessels, the yard said in a statement.

Navalrocha commercial director Sergio Rodrigues said order volumes are even outweighing work in hand at the mid-year point compared with the last three years, with close to 50 tenders now completed. Furthermore, the yard expects to break the 100-tender barrier before the end of the year, marking its busiest spell since 2017.

"Like all other shipyards, we have had to radically adjust to the new working environment, and quickly adapt to the myriad challenges posed by Covid-19. Throughout the last 18-months, our team and wider supply chain have demonstrated immense commitment and dedication, remaining steadfast in their service. As a result, we have been able to deliver a consistently robust response, rewarding the trust continually placed in us by our loyal client base. The outlook for the remainder of 2021 is looking very promising with several high-profile bookings already placed for summer and autumn involving bunker vessels, tugs, cement carriers and naval hydrographic survey vessels to name a few. On another positive note, we are also seeing a resurgence in cruise sector work with a string of projects placed over the next 24 months," Rodrigues said.

At the beginning of the year, Navalrocha opened its account with a four-day project involving the *Ponta do Sol* general cargo vessel, owned by Transinsular, involving work to propeller blades and refitting seals. The job was followed by the completion of an extensive project involving the *Ulisses* tugboat , owned by Reboport. The vessel underwent a major conversion involving the removal and reintegration of two Wärtsilä main engines with further work to auxiliary engines, amongst a broad package of other repairs.

In February, the yard welcomed Atlantic Ferries' passenger vessel *Roaz Corvineiro* for a 25-day reclassification project involving extensive blasting, painting and mechanical work. Later in the month, two MM Marine vessels arrived for separate 14-day drydockings as part of continued ballast water treatment system (BWTS) installations across the company fleet. Both the *Halki* and *Anafi* bunker tankers were fitted with new BWTSs, before undergoing blasting, painting, steel, mechanical and piping work.

By spring, Transinsular booked the recently converted *Dona Tututa* RoPax passenger ferry for a 38-day project involving complete blasting and painting, steel renewal and extensive repairs to the stern-ramp. Later in April, the LPG carrier *Santos*, managed by Singapore based Executive Ship Management, entered for a reclassification, involving blasting and painting, propeller shaft removal and inspection, along with repairs to valves, pumps and mechanical equipment. This marked a company first for Navalrocha with all repair work coordinated with a remote superintendent via video conference calls.

Also, in April, the *Garça Branca* passenger ferry from Atlantic Ferries underwent a 20-day drydocking for reclassification, painting and mechanical work, before the yard welcomed its first cruise sector job of the year with the arrival of *SeaDream II* operated by SeaDream Yacht Club for a 35-day project. Widescale refurbishment included blasting, painting, steel renewal and piping work alongside overhauls to luxury passenger accommodation and public areas. Rounding off the period, in late May the yard completed a twelve-day pontoon inspection, painting and repair contract for Confeitaria Nacional River Cruise's *Lisboa Vista Do Tejo*.

"A key focus for the months and years ahead is to attract greater volumes of chemical tankers and LPG contracts," said Rodrigues. "There is major potential for Navalrocha to expand in this area, due to our strategic location, close to the industrial port hub of Sines, which has an ever-growing global profile as the gateway to Europe. In Sines alone, we can tap into another 70% of the market share attracting new European and Asian shipping clients. We are also very well positioned for vessels travelling to ports further north including Aveiro and Viana do Castelo."

Floating docks in Dammam launched

SAUDI ARABIA | Heavy lift engineering specialist, Mammoet, has launched two floating docks, built at Zamil Shipyard in Dammam, Saudi Arabia. The docks will be used for the maintenance and repair of naval craft and were launched using the 'float-off' technique for the first time in the Kingdom. The docks have now been commissioned by French naval craft design and construction company, Constructions Mécaniques de Normandie (CMN).

CMN retained the Saudi Arabian branch of Netherlands-headquartered Mammoet to handle launch of the floating docks. The Dutch company's Saudi subsidiary undertook all engineering, procurement, logistics and execution for the project. Aspects included a thorough appraisal of all transport and marine engineering issues, and a series of risk assessments and warranty surveys to ensure safe and efficient execution.

A separate floating dock, together with mooring and ballast equipment and a team of experts, were mobilised from the United Arab Emirates. The two new 85m-long and 34m-wide docks, each weighing 1,450 tonnes, were transported from the Zamil fabrication facility to the quayside. From there, 96 axle lines of Self-Propelled Modular Transporter (SPMT) units were used to load the two new docks onto the separate one, before floating off the entire consignment at the right time and tide.

Two new floating docks for naval repairs were launched in Saudi Arabia

Source: Mammoet

New software available for designers and builders

DIGITAL TWINS | Finnish ship design specialist, Cadmatic, and NAPA, a software and data analytics company, have unveiled an integrated ship design setup using digital twins and software covering the entire lifecycle of an asset, from newbuilding to retrofits and conversions. Intelligent Ship Design will enable ship designers and shipyards to use new digital techniques including 3D model-based class approval, to collaborate across multi-site projects, and save time and money by avoiding the duplication of information across different systems.

The two companies have worked closely over a long period, providing integrated software for selected commercial ventures. The results are well trusted by designers and builders around the world, the companies said.

Cadmatic CEO, Jukka Rantala, said: "Together with NAPA, we have the most extensive experience within the market to improve the efficiency and profitability of the shipbuilding industry. We have a long history in shipbuilding and most shipyards and ship design companies in the world trust our advanced solutions and deep knowhow. I'm very excited about this opportunity to combine the forces of the two most advanced software solutions for the benefit of our existing and new clients."

Mikko Kuosa, NAPA CEO, added: "We strongly believe that by combining the best elements of both NAPA and Cadmatic, we are creating a superior solution that encompasses all the key aspects of ship design and delivers the benefits of a fully 3D-based design approach from the early stages all the way to production."

First purpose-built hospital ship delivered in China

GLOBAL MERCY | The world's largest civilian hospital ship, *Global Mercy*, has been delivered to the charity organisation, Mercy Ships, at Tianjin Xingang Shipyard in China.

Stena RoRo has managed the project so far and the company has recruited a crew from its Northern Marine Manning Services subsidiary to sail the purpose-built vessel from China to Belgium.

Sea trials of the hospital ship *Global Mercy* Source: Stena RoRo

The *Global Mercy* will then complete its outfit of medical equipment and take on volunteers in preparation for a voyage to Dakar, Senegal, where it will provide medical support for some of the world's poorest people.

The 174m-long, 28.6m-wide, 37,000gt vessel has six operating theatres, beds for 200 people, a laboratory, an eye clinic, and training facilities. It is the first ship to have been designed and built to meet the specific needs of Mercy Ships.

Per Westling, managing director of Stena RoRo, commented: "We are very proud to take delivery of this special ship. The activities to be carried out on board have placed certain special and stringent demands on shipbuilding. For the shipyard, it was the first time they had built a vessel of this type – a challenge they have managed extremely well.

"For Mercy Ships, the delivery means that their capacity to provide care has more than doubled and, at Stena RoRo, we are happy to be a part of their fantastic work through the construction of the *Global Mercy*."

The vessel is classed by Lloyd's Register, will fly the flag of Malta, and will operate along the African coast.

Ballast water treatment goes digital

OptiLink is designed for ship-to-shore sharing of operational data for ballast water treatment systems to optimise fleet efficiency
Source: Optimarin

DATA SHARING | Norway's Optimarin, a ballast water treatment manufacturer, has unveiled the sector's first digital system, developed to raise efficiency in the management of ballast water operations. OptiLink™ provides both ships' crews and shore-based personnel with real-time information, with data shared via a ship's own communications system or on the OptiLink cloud.

The system has been developed to simplify this often unpredictable aspect of ship operation which, in some regions, can lead to non-compliance issues and costly delays. OptiLink is designed to resolve the regulatory compliance headache for ship operaters, as well as give improved customer support, the privately owned company said.

Leiv Kallestad, chief executive, explained. "The whole aspect of ballast water treatment changes from a manual operation to a system approach where the ballast water treatment system (BWTS) and its operations become an integral part of the vessel's functions. This means the BWTS can be managed proactively in support of reduced downtime and reduced fuel consumption, with less hassle, as control over the transfer of ballast water in and out of the vessel improves greatly."

The new setup offers ship operators a range of potential benefits. For instance, OptiLink can analyse big data relating to system performance and water quality at previous ballast locations. It can therefore highlight issues such as high ballast water turbidity, which has the potential to disrupt ballasting operations.

Ships' crews will have immediate access to water quality and system operation through a visual interface, Optimarin said, while owners and managers will have access to a fleet-wide overview of ballast water operations. Continuous condition monitoring of the system will enable proactive maintenance and enable support from technical personnel ashore should the need arise.

OptiLink, which is available on a range of finance packages and will have the potential to work with third-party systems, has potential commercial benefits too, the company claimed. BWTS performance data can now be transmitted directly to regulatory authorities, while certificates of compliance can be sent directly to port authorities in advance to reduce the need for inspections and shorten turnaround times.

During a recent webinar launching the system, Optimarin executives pointed to possible 'heat mapping' of ports, identifying locations where water quality could present a challenge. This could require ballast water exchange at sea or the risk of non-compliance at the next port. The company said that this is likely to become increasingly important as ship operators face the IMO's tighter D2 regulation in 2024 introducing new limits on the number of viable organisms in discharges.

Ballast water management should not now be viewed as a necessary evil, but rather as an integral component of efficient ship operation, the company said.

All-plastic butterfly valve presented

WATER TREATMENT | GF Piping Systems has launched the lightweight, all-plastic Butterfly Valve 565 for water treatment applications. The new product was presented at the company's recent "Flow to the Future" digital event, in which GF Piping Systems demonstrated its latest water treatment innovations to attendees from more than 80 countries.

According to the Swiss manufacturer, the Butterfly Valve 565 is applicable for pressures up to 16 bars, and temperature ranges from -10°C to +80°C. It is 60% lighter than a comparable metal valve, so a single technician can safely and easily handle it during installation, GF Piping Systems said. The lightweight material also minimises the energy consumed for transportation and installation. After installation, the reduced static weight's advantages can become even more significant, e.g., in marine water flow systems.

The new Butterfly Valve 565

Source: GF Piping Systems

"The Butterfly Valve 565 is a complete solution for the water segment which solves all of the typical problems customers have been experiencing with metal valves," said Thomas Kuessner, Head of Product Management – Valves at GF Piping.

Designed for quick and easy installation, the Butterfly Valve 565 comes in the same length as metal valves (ISO 5752 Row 20), therefore avoiding costly modifications on the existing piping systems, a clear advantage over its metal opponent.

Metal butterfly valves suffer from wear – whether due to corrosion, contamination, or extended use – they are not as durable and need to be replaced, GF Piping noted. The resulting downtime leads to delays in operations, additional installation and purchasing costs, and the need to deploy an expert to install, check, and monitor the new metal valve.

Anti-vibration fire retardant awarded type approval

POLYURETHANE | Austrian vibration isolation specialist, Getzner Werkstoffe, has received type approval from ClassNK for its fire-retardant elastomer, Sylomer Marine FR. The product, with both vibration protection and fire retardant properties, has been awarded a Certificate of Approval for Primary Deck Covering by the classification society.

Sylomer Marine FR has a wide range of applications in the shipping and offshore sectors. And for ships longer than 100m, fire-retardant materials are in any case compulsory in anti-vibration arrangements.

The material is suitable to use as a 'floating floor', decoupling passenger and crew cabins, for example, as well as engine room and other machinery spaces. Different specifications are available, depending on the particular application, the company said.

Source: Getzner Werkstoffe

Floating floors with Sylomer Marine FR increase the comfort levels on board substantially

Thomas Gamsjäger, senior vice president of Getzner Werkstoffe's Industry Division, explained. "The solution is ideal for service vessels or cargo ships but has also been applied in floors on yachts. With Sylomer®, we elastically decouple cabins, wheelhouses or machine rooms and efficiently reduce the transmission of structure-borne noise. Floating floors increase the comfort levels on board substantially. But not only that: the service life in these areas is optimised and the damage to the infrastructure is minimised."

The company identifies some of the product's other benefits. It is resilient and maintenance-free and has a low static-to-dynamic stiffness ratio, making it more acoustically effective. The vibration protection is resistant to fresh water, salt water, oils and greases, and is free from plasticisers and environmentally harmful substances.

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By Informa Markets

AiP for floating platform ballast system

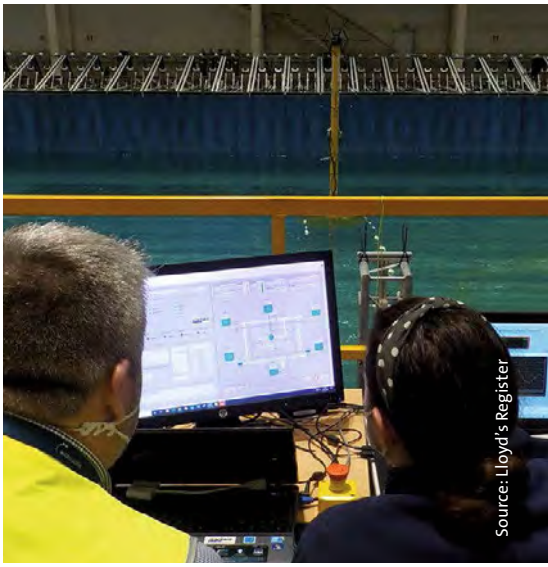
LLOYD'S REGISTER | Spanish offshore engineering and wind technology company, Seaplace, has been granted Approval in Principle (AiP) from Lloyd's Register for a new technology to improve the stability of floating offshore wind platforms. The active ballast control technology, called Crown, is expected to reduce capital cost and improve the economics of floating wind developments.

The technology allows the ballast control system to alter a floating platform's draught from transport to operational depth. It can also compensate for the loads imposed on the structure by wind, thereby improving stability.

The system is designed with built-in redundancy. It will continue to stabilise a platform even if one compartment is damaged; and it will continue to function even if a component, such as a valve or pump, fails to operate.

Mark Darley, the classification society's Marine & Offshore director, said: "Lloyd's Register is proud to have supported Seaplace in the final phase of the Crown technology development, enabling the company to move on to the full-size demonstration concept stage. This novel technology could help operators and their floating wind assets reach their market potential, with estimates of up to 10 GW of capacity projected to be installed globally by 2030, and more than 100 GW by 2050."

The technology is likely to be applicable to other offshore energy structures in the future. Seaplace believes that these could include hydrogen/ammonia and offshore solar farms.



Tank test of the active ballast control system

Concept verification of floating wind power system

MOWUs | The classification society DNV has completed a concept verification review of Odfjell Oceanwind's WindGrid™ system for mobile offshore wind units (MOWUs). DNV's review confirms the technical feasibility of the WindGrid system, and that expected reductions in CO_2 emissions for North Sea applications are in the range of 60-70%, compared with electricity generated by conventional gas turbines.

Odfjell's WindGrid has been developed to ensure an uninterrupted power supply from MOWUs to micro-grids. It combines energy storage, grid converters and floating wind turbines in order to enable gas turbine generators to be shut down during peak wind power production.

"This feasibility verification report marks an important milestone for Odfjell Oceanwind," said Per Lund, the company's CEO. "It demonstrates that mobile offshore wind units can offer an attractive alternative for the oil and gas industry as it strives to reduce greenhouse gas emissions. The flexibility of the MOWUs, combined with emission cuts exceeding the industry's 2030 ambitions, means that the industry can deliver on the green shift faster and more cost effectively than any other alternative that exists today, including power from shore."

"We were very proud to have been asked to work with Odfjell on this project, continuing to build on our longstanding and productive relationship," said Erik Henriksen, director of Business Development – Offshore Classification, DNV Maritime. "Solutions like WindGrid in the new floating wind sector can make a large impact on the speed of the energy transition. This project also demonstrates how our customers can utilise DNV's deep cross industry expertise, in maritime, wind, and energy, to tap into new markets with confidence."

DNV's review, combined technical units from across the entire Group and included a technical assessment of all components, a HAZID to identify hazards that could prevent successful implementation, and a verification of the estimated wind power production with corresponding fuel savings and CO_2 emission reductions for the oil and gas installation connected to the integrated MOWU and WindGrid system.

Rendering of the WindGrid™ system in operation Source: Odfjell Oceanwind

Underwater technology in focus

DIGITAL OCEAN CONVENTION | On August 25th and 26th, the Digital Ocean Convention Rostock will take place for the second time. Its organisers, the Subsea Monitoring Network, the local business development agency Rostock Business and Fraunhofer, have announced the participation of high-ranking national and international speakers on economics, science and politics. They will discuss latest developments, trends and projects relating to digital underwater technologies in a lunch-to-lunch event over two days.

The Digital Ocean Convention had its premiere with over 200 participants in 2019. In 2020, the conference and accompanying exhibition had to be cancelled due to the Covid-19 pandemic.

Patron of this year's event is the Prime Minister of Mecklenburg-Vorpommern, Manuela Schwesig. Live streams will digitally involve those who cannot travel to Rostock. An accompanying exhibition will present current digital subsea technology products and developments.

The title of the conference is "Future field digital subsea technology: What it needs, what it does and where it is implemented". After an impulse speech given by Asgeir Johan Sørensen from NTNU, the German Government's maritime coordinator Norbert Brackmann will discuss the necessary political framework for future-oriented research with representatives of the state government of Mecklenburg-Vorpommern and the European Commission.

The chances of an interdisciplinary technology campus – like the Ocean Technology Campus (OTC) Rostock, which is currently under development – will be the subject of a second panel discussion, which will focus on international competence with Sweden's Sabina Fredin from Blekinge Institute of Technology, Norway's Gisle Nondal from GCE Ocean Technology and Canada's Melanie Nadeau from the Centre for Ocean Ventures & Entrepreneurship COVE.

A session about currently operated EU funding programmes from Norway as well as the representation of a successful international cooperation of the Norwegian Maritime Robotics AS and the German EOMAP GmbH & Co KG will round off the day. The day's closing keynote address will be delivered by Dr. Mathias Jonas, Secretary General of the International Hydrographic Organisation.

Rostock's mayor Claus-Ruhe Madsen will open the second day, which will offer deeper insights into various application areas such as UXO, offshore repair, digital twins, and the opportunity for technical exchange in parallel workshops. Among others, David Shea from the Canadian Kraken Robotics System Inc, Dr Simon Jirka from 52° North GmbH and Prof. Andreas Birk from Jacobs University will provide impulses for the workshop sessions. The start-ups Framework Robotics, Deeeper Technology and TrueOcean GmbH will present their business ideas in a separate workshop.

Further information and tickets are available at: www.rostock-business.com/en/doc

All-in-one evacuation suit spurs personnel safety

OFFSHORE WIND | Denmark-based safety specialist, Viking, has unveiled an all-in-one evacuation suit for technicians working at offshore wind facilities. The Viking YouSafe™ Hightide suit has rescue harnesses, gloves, and an in-built descent device with sufficient strength to support an outside descent and enough buoyancy for a person in distress to stay in the water until help arrives.

The composition of the suit ensures that no more than 2°C of core body temperature is lost over a six-hour period. It is easy to put on, has harness hooks connected to the platform for safe descent, and can be used for two people at a time, Viking said in a statement. It is also suitable for the safe rescue of unconscious personnel. The suit is ISO and SOLAS approved, and deliveries have already started to wind farms off the coasts of Germany, Denmark, the Netherlands, and UK.

The number and size of wind farms at sea, and greater distance from shore, has led to growing personnel safety concerns. Meanwhile, the dramatic increase in the contribution of offshore renewables to the world's energy mix continues to accelerate, with new wind energy developments in a number of countries including the United States. But despite the advances in condition monitoring technology, the regular attendance of technical service personnel is essential.

Viking has launched two new suits for offshore personnel evacuation Source: Viking

Bettina Kjergaard, global product manager, Offshore Wind, at Viking Life-Saving Equipment, commented: "The issue was laid bare when two young technicians died in a fire on a smaller Vestas turbine in the Netherlands in 2013, and it's fair to say that higher towers since have also increased the scale of the challenge. When technicians land on the tower platform at the bottom of the tower, the convention is to take off their immersion suits and lifejackets and only keep their harnesses on to climb to the top. "It's widely recognised that this is far from satisfactory from the safety perspective. Some operators provide extra gear and store it at the top of the tower. However, a technician needing to don a suit, lifejacket, harness, belt and headlamp in an emergency as separate items loses critical seconds," she explained.

Meanwhile, the safety specialist has also launched a new walk-to-work crew transfer suit that is packed into a bag attached to the user's lifejacket, instead of being worn during the transfer between support vessels and offshore installations. The Viking YouSafe™ Walk to Work is a lightweight immersion suit that is attached to the back of the lifejacket with strong Velcro straps and clearly visible to the officer on watch. It leaves the technician with both hands free to hold on to the rails.

WTIV tailored for large-scale wind farm installations

ATLAS SERIES | Danish marine architect Knud E. Hansen has developed a new design for a wind turbine installation vessel (WTIV) with a length of 155.4m.

The new Atlas A class vessel will be able to carry four new-generation 14-MW wind turbines and aims to achieve cost-effective installation of large-scale wind farms. The vessel is specifically dimensioned for transporting and assembling wind turbines on top of pre-installed foundations.

The powering of the vessel is provided by eight generators connected to a direct current grid and a battery pack, allowing the engines to run at variable speed for fuel efficiency while also enabling load levelling and peak shaving. The batteries not only provide quickly available power, avoiding unnecessary spinning reserve power from the generators, but also make it possible to recover approximately 60% of the energy used for jacking.

The main deck of the accommodation block includes an operations centre consisting of offices and meeting rooms as well as a hospital, day room, TV room and workshop. The three decks above include a total of 114 cabins for contractors, crew and officers. The top deck consists of a bridge with centre and wing consoles and a large helicopter landing area.

Illustration of the Atlas A class vessel Source: Knud E. Hansen

Maersk upscales in Norway

REFLAGGING | Maersk Supply Service (MSS) is to strengthen its Norwegian operation by registering one of its anchor handlers under the Norwegian flag, hiring a Norwegian crew, and opening an office in Bergen.

The company's strategy is to take up opportunities in the towing and installation of floating assets in the offshore energy sector, including the rapidly developing wind power segment. At the same time, MSS believes that Norwegian decarbonisation initiatives fit well with the company's own objectives.

Duncan MacPherson, who will head the new MSS operation in Norway as managing director, said: "Norway is a frontrunner when it comes to exploring new ways of lowering the environmental footprint of the offshore energy industry. Our anchor handlers are some of the most modern and energy-efficient vessels in the world.

"Therefore, we are confident that they are a suitable fit for the Norwegian market," he continued. "Our ambition is to be carbon neutral in 2050 and to have reduced our carbon intensity by 50% by 2030. We have already taken firm action to improve our energy efficiency with behavioural changes and technical upgrades."

Maersk Supply Services is opening a new office in Bergen and will register one of its offshore vessels under the Norwegian flag

Alternative to diesel generators

ICCP-POD | The two Dutch companies, Corrosion and Amphibious Energy, have launched the ICCP-POD. It is what they call an environmentally friendly alternative to using diesel generators to supply energy during the construction phase of wind turbines, and sacrificial anodes to protect turbine foundations against corrosion.

The ICCP-POD is said to to help make offshore wind power more sustainable

The ICCP-POD combines two advanced technologies. The EnergyPod, developed by Amphibious Energy, is an easy-to-transport autonomous energy plant that uses sun, wind, batteries and intelligent electronics to provide sustainable energy during the 18-month construction of wind turbines, meaning that costly and environmentally unfriendly diesel generators are no longer required.

To protect against corrosion during this construction phase, Corrosion developed compact ICCP (Impressed Current Cathodic Protection) units. By using an electronic current supplied by the EnergyPod, these represent an innovative eco-friendly alternative to sacrificial anodes, which discharge large quantities of metals and heavy metals into the water. When the wind turbines are installed and grid-connected, the energy supply for the ICCP system is switched from the EnergyPod to the wind turbine itself.

"Corrosion was the first company in the world to develop a cost-effective, easy-to-maintain and environmentally friendly anti-corrosion solution for wind turbines foundations," said Niels Ros, Manager Offshore Wind at Corrosion. "We are delighted that through this partnership with Amphibious Energy, we are also able to offer the same sustainable protection solutions during the construction phase of wind turbines."

"By partnering with Corrosion, we are able to bring two unique technologies together, which will drive down the costs for the offshore industry to protect their installations from corrosion in a 100% green way. This represents a big step forward in achieving net-zero operations for the offshore industry," said Willem van der Merwe, Director at Amphibious Energy.

The ICCP-POD delivers substantial cost savings compared with a diesel generator and further savings can be made in other ways. For instance, it is possible to install uncoated foundations, foundations with a single base coat or use less carbon steel (corrosion allowance), depending on customer needs and design boundaries.

In terms of environmental performance, Corrosion's ICCP unit provides major benefits. Over a 25-year period, Corrosion's systems discharge approximately 1.5 million times less aluminium into the sea than traditional sacrificial anodes. Furthermore, the EnergyPod is also completely recyclable, and can be re-used several times over a period of five to ten years so that costs will decrease even further, the companies said in a statement.

Contract to build two installation vessels

X-CLASS | Denmark's Cadeler, a supplier of installation services, operation and maintenance works in the offshore wind business, has ordered two X-class wind turbine installation vessels at China's Cosco Shipping Heavy Industry. Upon completion, the vessels will be the largest in the industry, Cadeler said in a statement. The first vessel is scheduled for delivery in the third quarter of 2024 and has already been commissioned by Siemens Gamesa for its first project.

The total order amounts to USD 651 million. Mikkel Gleerup, CEO of Cadeler, commented: "Expansion of our fleet is an important strategic priority to ensure that we can meet the demand we are seeing from clients for greater installation capacity. By providing energy-efficient vessels with very advanced technical specifications and climate-friendly features, we are proud to be taking this step to meet the current and future demand of the industry. Offshore wind plays an increasingly important role in the green energy transition, and the installed offshore wind capacity is expected to grow substantially in the coming years across several regions. We are well-positioned to play a role in cost-competitive offshore wind power production by providing efficiency gains for turbine manufacturers and wind farm owners".

The two vessels will each have deck space of 5,600m², a payload of 17,600 tonnes and main crane capacity of more than 2,000 tonnes at 53m. They will be able to transport and install seven complete 15-MW turbine sets or five sets of 20plus-MW turbines per load. This will cut down the number of voyages needed for each project, accelerating installation and minimising the carbon footprint, Cadeler said.

"Compared with the original specifications of the X-class vessels, our final design includes an upgraded jacking system and main crane. This is to better cater for the wind turbines of tomorrow, taking into account the latest input provided from clients and partners," said Gleerup.

To reduce the impact on the environment, Cadeler outlined key deliverables for the vessel specification which were evaluated as part of the overall tender process for construction of the X-class vessels. They included the mitigation of the environmental impact, minimised use of hazardous substances and that the vessels must be recyclable.

Additionally, specific technological improvements are planned for the new design. These include a shore power connection which is expected to reduce fuel consumption by up to 15%, fuel-efficient engines and optimised engine sizing, as well as a battery pack with capacity to reduce fuel consumption during crane operations and DP manoeuvring. The vessels will also include technology for the regeneration of power from the jacking system and cranes.


Source: Cadeler

Swire Pacific Offshore has rebranded its subsidiary, Swire Blue Ocean, as Cadeler. Shown is the installation vessel *Pacific Orca*.

Cooperation for offshore wind projects

NORWEGIAN NORTH SEA | RWE Renewables, Equinor and Hydro REIN have signed an agreement to cooperate on offshore wind in Norway. Together, the partners intend to prepare and submit an application to the Norwegian authorities for the development of a large-scale offshore wind farm in the Norwegian North Sea in the Sørlige Nordsjø II area.

The Norwegian Ministry of Petroleum and Energy has designated a total of two areas for offshore wind energy: Utsira Nord and Sørlige Nordsjø II. Currently, the authorities are working on the approval process for Norwegian offshore wind projects in these areas. The designated area borders the Danish area of the North Sea and, according to RWE, is ideally located to supply electricity to various European countries from there.

Equinor and RWE have already successfully implemented large-scale offshore infrastructure projects and operate them efficiently. Together, the two companies have commissioned the 385-MW *Arkona* offshore wind farm in the German part of the Baltic Sea, which has been supplying green electricity to the equivalent of around 400,000 German households since 2019.

Joining forces in Poland

Meanwhile, RWE Renewables is accelerating the development of the offshore supply chain in Poland. The company, via its Polish subsidiary Baltic Trade & Invest Sp. z o.o., recently signed a series of agreements (Letters of Intent) with Polish companies from the maritime sector. With *F.E.W. Baltic II* RWE is currently developing an offshore wind project in the Polish Baltic Sea, which has a planned installed capacity of 350 MW. The project will enable RWE to contribute significantly to Poland's green energy transition and will further strengthen the local supply chain by intensifying the collaboration with Lotos Petrobaltic SA, Polish Ocean Lines SA (POL) as well as with the Port of Gdynia Authority SA.

Generic shot of a large-scale offshore wind farm Source: RWE

The recently agreed cooperation with Lotos focuses on the technical exchange of experiences in geotechnical surveys, installation and service vessels as well as subsea inspection and services.

The collaboration with POL puts the focus on service fleet capabilities, CO_2 reduction and the training of crews in offshore wind business. Meanwhile, the Port of Gdynia Authority plans to provide its experience and knowledge as an offshore wind developer across all technical areas to support the planning and construction of offshore terminals.

12-MW floating wind turbine concept unveiled

ARPA-E'S ATLANTIS | Researchers from US-based company GE have unveiled details of a current two-year project through the Arpa-E's Atlantis (Aerodynamic Turbines Lighter and Afloat with Nautical Technologies and Integrated Servo-control) programme to design and develop advanced controls to support a 12-MW floating offshore wind turbine. GE is collaborating on the project with Glosten, a design and consulting firm in the marine industry, and the developer of the PelaStar tension-leg platform floating wind turbine foundation.

Accelerating the development of new technologies to promote the future of floating offshore wind energy is the key objective of Arpa-E's Atlantis programme. By combining a 12-MW GE turbine with Glosten's tension leg platform, the team has taken on the challenge of designing a lightweight floating turbine with up to 35% less mass in the tower and floating platform. This is expected to result in a significant reduction in the resulting levelised cost of energy of the electricity generated by this turbine.

An artist's rendering of the 12-MW floating wind turbine concept GE Research and Glosten are jointly designing Source: Glosten

The core principle that makes this possible is co-designing the control system with the tower and floating platform.

Harnessing energy from floating offshore wind would dramatically expand the power generation potential of the sector as a whole. According to the National Renewable Energy Lab (NREL), the introduction of floating turbines would expand the potential of US offshore wind resources, for example, to more than 7,000 TeraWatt hours (TWhs) per year, nearly double the total annual US energy consumption of 4,000 TWhs.

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.

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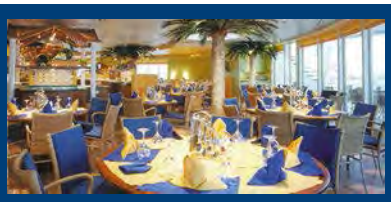

5 Ships' equipment

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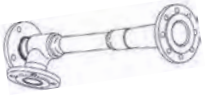

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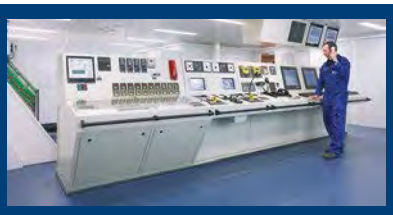

8 Measurement + control devices

8.01 Engine control systems

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8.12 Automation equipment

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9 Navigation + communication

9.04 Navigation systems

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11 Deck equipment

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12 Construction + consulting

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14 Alarm + safety equipment

14.01 Lifeboats + davits

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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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New services launched for fleet-wide IT management

ITLINK | Maritime communications and satcoms company, Marlink, has rebranded its remote IT service, KeepUp@Sea, to ITLink, enabling efficient IT management from shore. ITLink, already installed on more than 1,000 ships, enables shore-based personnel to manage and update PCs aboard an entire fleet of ships simultaneously, rather than having to undertake the process one ship at a time.

The company has launched two new services. Its ITLink Entry-level package reduces crew involvement in software installation and system updates. Instead, shore-based staff have a fleet-wide overview of IT network security and cyber compliance.

Meanwhile, Marlink's ITLink Advanced setup provides a range of IT management features and tools, enabling ship operators to manage all aspects of their fleet-wide IT operations and enforce a clearly defined and standardised IT and cyber security policy, the company said. There is also an option to outsource IT asset management to Marlink.

Since the beginning of this year, ship operators have been required to demonstrate cyber security resilience as part of the ISM Document of Compliance. However, Marlink pointed out that the number of individual audits and inspections continues to rise, and ship operators require IT systems to be kept up-to-date and secure as efficiently as possible.

Nicolas Furge, Marlink president, Digital, commented: "Our ITLink solutions are designed to provide an expanded range of options that support management and compliance, from minimum requirements to complete and fully managed IT solutions. By providing a simplified range of solutions for smaller and larger owners or ship managers, we have responded to the need to help them improve efficiency, operate safely and meet compliance with IMO 2021."

The use of Marlink's managed services, the company said, can save money for ship operators. The fleet-wide software updates can be provided more quickly and safely, while ensuring compliance with IMO's latest cyber security regulations.

Cloud-based ECDIS training available everywhere

SIMULATION | Kongsberg Digital (KDI) has launched an online navigation training package, K-Sim Connect, enabling maritime training establishments to provide cloud-based ECDIS training for students, wherever they are in the world. The system, which complies with requirements set out in the IMO/STCW Model Course 1.27, is based on the company's real-life K-Nav ECDIS and incorporates the same functionality. Students can therefore practice electronic navigation procedures and undertake exercises such as voyage planning and simulation.

The K-Sim ECDIS application can import and export the commonly-used RTZ route format. The company explained that this enables the exchange of routes with any ECDIS system, whether installed at a training establishment for type-approved ECDIS training, or on board a ship. The exchange of route plans is therefore possible between ships and shore-based personnel, who can then make recommendations or suggest alternative routes.

Kongsberg Digital's Andreas Jagtøyen, EVP Digital Ocean, said: "This is a vital supplement to KDI's ever-expanding catalogue of products and services, at a time when flexibility and accessibility are more important than ever to instructors and trainees alike. It will be an invaluable asset, not just for training purposes, but also in decision support contexts in the future."

Antenna platform to future-proof connectivity

SAILOR XTR™ | Cobham Satcom has launched the new Sailor XTR™ antenna platform. The Sailor 1000 XTR Ku is the first of a new generation of software-controlled antenna systems designed for quick deployment, operational reliability, simplicity, and best-in-class radio frequency (RF) performance.

Developed and designed by Cobham Satcom, Sailor XTR integrates the best of the Sailor VSAT technology into a new platform with cutting-edge software and electronic capabilities that prepare it to operate in future satellite constellations in LEO, MEO, GEO and HEO, the company said in a statement. The 1m antenna has a new simplified and robust pedestal for better antenna performance and easier and simpler conversion between Ku- and Ka-bands, it added.

Sailor XTR is prepared for the Internet of Things. Built-in IoT data protocols such as Message Queuing Telemetry Transport (MQTT), Simple Network Management Protocol (SNMP) and RESTful API could make Sailor VSAT and Sailor XTR antenna systems a self-reporting item in a typical satcom/IT network, providing up-to-date detailed antenna information and enabling preventive maintenance. This helps ensure uptime, boosts the efficiency of on-board IT systems and contributes to optimised vessel performance, Cobham Satcom said.

the company has already installed the first SAILOR 1000 XTR Ku on a vessel operating in Scandinavian waters. The installation was completed on the cruise ferry *Pearl Seaways*, with owner DFDS in attendance.

Cruising prepares a steady comeback from Covid-19

NEW REQUIREMENTS More cruise ships are about to resume operations. How and when should they prepare? What new regulations should they take into consideration, and how can the quality of operations be enhanced to a new normal? Captain Jan Solum, Area Manager East - North America, DNV, shares his insights and some answers to these questions.

After a year of insecurity, the cruise business is coming back all over the world, but at different speeds and operations in various cruise locations. While services out of Asian ports have begun before others, as have some countries in Europe, travelling out of United States and Caribbean ports is expected to start a bit later.

Today, we estimate that about 85% of the global cruise industry is waiting or in the process of starting up. In April this year there were around 25 cruise ships that had resumed operations, while in July about 100 cruise ships were likely to be in service again. The booking rates for cruise companies are at the best level since the beginning of the pandemic, so it is likely that the cruise industry will rebound quickly.

Fulfilling new requirements due to Covid-19

Each port, and country, has requirements and guidelines that need to be followed. Some ports have more extensive and prescriptive regulations, while others follow more general guidelines. Some flag administrations have also issued guidelines and expectations that need to be considered. In addition, there are industry guidelines, like the Healthy Sail Panel recommendations and the EMSA Guidelines.

Building on the extensive medical expertise from certifying 650 hospitals in the United States, DNV has conducted more than 4,000 audits to ensure requirements for the prevention of infection risks and healthcare-associated infections are met.

These requirements have been adjusted to meet the needs of the cruise industry to ensure that vessels that are certified by CIP-M (Certification in Infection Prevention and Control for Maritime) meet all the necessary regulations and requirements relating to operations for each vessel. Using internal healthcare department experts, together with experienced cruise vessel maritime auditors, DNV is supporting the industry by ensuring that ships are ready to operate from an infection, prevention, and control perspective.

Time now to start preparations

Cruise lines should start preparing now, or as early as possible. Ships have been idle for a year, with reduced crew on board, and many maintenance jobs may not have been carried out in accordance with the planned maintenance system. In addition, many crews have left the sector for jobs ashore, so finding normal cruise staff and resources with knowledge, competence and cruise experience may be a challenge.

Cruise ships classed by DNV are mostly current on all statutory and classification certifications since, together with its customers, it was decided to keep the majority of the fleet ready to resume service at short notice, benefiting from approved remote surveys.

However, some may have elected to lay up their vessels, If so, they need to reactivate them in a timely and planned manner. Formerly laid-up vessels must complete all overdue surveys and rectify overdue deficiencies prior to resuming service, including drydock in some cases.

Key steps to take in resuming operations

Besides crew familiarisation, technical equipment may not have been periodically maintained over recent months and should be given high priority and focus. This includes life-saving and fire-fighting equipment, environment-related equipment such as scrubber installations, sensor calibrations and ballast water management systems, and essential technical machinery.

Breakdowns resulting from inadequate planning can be very costly and lead to significant downtime or delays in starting up, far exceeding maintenance or preparation costs. A number of ships may decide to resume operation with reduced manning, and so emergency-related systems must be adjusted accordingly, such as muster lists, emergency plans and response teams, for example. Reduced manning may also affect planning in how to handle the various types of emergencies on board, so related plans may need a full review.

Ensuring that crew are best prepared is essential

Internal training programmes and protocols should be suitably adjusted to reflect the different operations with which a cruise vessel enters service, compared with normal business. Even experienced operators need to consider the start-up as resembling a new company and should plan accordingly.

This includes making and implementing procedures and standards relating to the new area of infection prevention and control. The safety management system needs to be adjusted accordingly.

The use of a computer-based training system could help the crew to become familiar with the new operations, and some training can also be undertaken before embarking. It is also important to bear in mind that renewals of seafarers' documentation (MLC 2006, STCW and Medical Certification) may be a challenge, as some countries may lack certain personnel or the ability to authorise documents due to local Covid-19 challenges.

The cruise industry is preparing to resume operation Source: DNV

Improving safety and efficiency in degassing tanks

NANOTECHNOLOGY For as long as oil and petrochemicals have been in use by transportation and other industries, safely managing their highly flammable, toxic, and environmentally damaging vapours has been an ever-present challenge. Even with the increasing emphasis on safety procedures and better training, these invisible and dangerous vapours continue to result in loss of life and property. Nanotechnology can now provide safer and faster solutions that were not thought possible with conventional methods, writes Fernando Lehrer, CEO of US-based NanoVapor.

The NanoVapor sytem allows for safe degassing Source for all images: Ecochlor

When gas freeing a fuel or product tank, NanoVapor's technology virtually stops vapour formation at its source by forming a molecular barrier on any surface where oil, fuel, or other petrochemicals are present. This molecular layer is so thin that only a tiny volume of its nano-engineered suppressant molecules is needed to suppress vapour concentration to safe levels. Because virtually no residue is left behind, the need for costly and time-consuming recovery operations can be minimised or eliminated.

Through Ecochlor's global distribution network, NanoVapor's technology is now available to the maritime industry.

Because there are no reactive chemicals or inert gases involved with NanoVapor, breathable air is never displaced and normal oxygen levels are maintained throughout the confined tank space. This also results in a more environmentally friendly process, as no additional hazardous waste is created in this gas-freeing process.

Tank vessel cleaning and maintenance operations

NanoVapor is used during the process of maritime tank cleaning operations, on tank barges and product tankers, in both cargo tanks and bunker tanks, as it eliminates VOC emissions, as well as H_2S, and other hazardous air pollutants.

Industry safety standards require that before work is performed on inland barge tanks, the tank environment is gas-free (<10% of the minimum explosive concentration or LEL) to ensure a safe environment for the crew and vessel. The surroundings must remain below 10% of LEL while the work is carried out to ensure that a safe environment is maintained. Moreover, environmental emission requirements in certain areas demand that tank emissions be mitigated by a flare or equivalent method until the tank reaches concentrations as low as 50 ppm.

NanoVapor degasses tanks faster, safer, and greener than traditional methods (e.g., drawing fresh air through the barge tanks to a flare until the required fuel vapour concentration is reached, or the use of inert gas). By introducing the fuel vapour suppressant, a safe tank environment is quickly achieved and maintained without a reduction in tank oxygen levels.

The following is data recorded from using NanoVapor to degas a 1,600m^3 tank barge carrying cyclohexane. Tanks with high vapour pressure fuels, such as cyclohexane, are often challenging to degas with conventional methods due to constant vapourisation of residual fuel.

The barge had three tanks of 140,000 gallons or 529m^3 each. Each tank was degassed

individually, two with air, and one with NanoVapor, in order to provide a comparison between NanoVapor and conventional methods. All tanks remained on flare control during degassing until 50 ppm was reached.

Figure 1 shows that if all tanks had been degassed with air, the barge would have required 30 hours to degas. By using NanoVapor on the entire barge, degassing would have only needed 15 hours, a reduction of 50%.

This significant time saving generates higher throughput for the maintenance provider and higher asset uptime for the barge owner. In addition to the time savings, applying NanoVapor to the entire barge versus conventional air purging resulted in significant financial savings, due to a 50% reduction in time to run the flare operation, and a 50% reduction in CO_2 and NOx emissions.

For larger tank barges (30,000 bbls or 4,750m^3), one of NanoVapor's customers – a tank cleaning facility on the Gulf of Mexico – reported overall savings in time to degas a barge at 70%. The use of standard air ventilation would typically take 96 hours to obtain a gas-free condition for the cleaning crew to enter the tanks; in operations with NanoVapor the same gas-free condition was achieved in 30 hours.

Small tank vessels without inert gas systems

According to SOLAS, inert gas systems are mandatory only for new tankers of more than 8,000dwt; prior to 2016 the limit was vessels greater than 20,000dwt. Thus, a large number of these vessels do not carry this important safety device. As a consequence, explosive VOC concentrations are a frequent occurrence. Too often, this results in explosions, damage to ships, environmental contamination and injuries to crew members, sometimes fatal. Still, retrofitting an inert gas system on these small vessels may be next to impossible for technical and economic reasons.

The NanoVapor technology could be a simple and cost-efficient solution to this problem. Applying a vapour suppressant barrier during cargo operations will efficiently stop the formation of these hazardous conditions and improve crew and vessel safety.

Even on larger vessels that are required to have and use inert gas systems, in addition to being a large fuel consumer while in port, these systems often fail to function at full capacity resulting in slower cargo operations and the related financial impact from demurrage. NanoVapor can be used by way of a back-up, or applied in tandem with inert gas to ensure continued cargo operations and minimise fuel consumption.

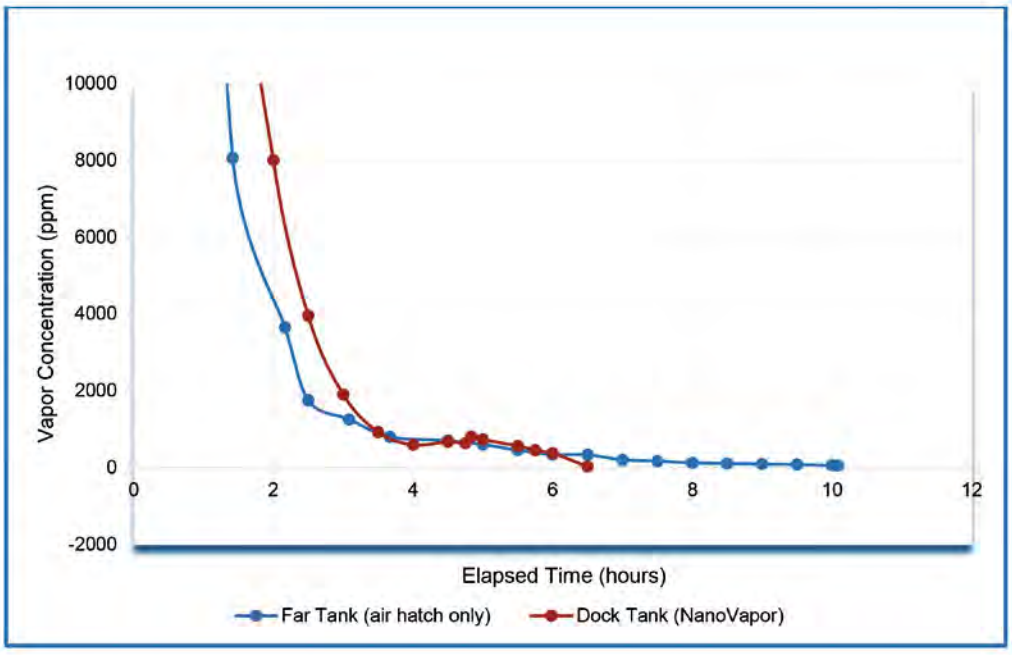
The business of safety and sustainability

For tanker and barge operators, incorporating nanotechnology into their normal gas-freeing and cargo procedures can represent a win-win outcome by improving safety and efficiency, while saving the cost of downtime related to the lengthy gas-freeing process. These time savings also translate to reducing atmospheric emissions and/or the need for vapour recovery systems.

Currently, NanoVapor's vapour suppression systems are optimised for hydrocarbons that are categorised as C5 or higher, including heavy fuel oil, low sulphur fuel oil, and other refined fuels. Its patented systems and nano-engineered suppressants have been designated as an international Best Practice Standard for degassing underground storage tanks by energy major Shell, and successfully adapted at scale for large aircraft, barges, and above-ground storage tanks. NanoVapor's ST1000M degassing delivery system is type approved by Lloyd's Register, and the unit is portable, simple to use, and intrinsically safe.

Because oil and petrochemicals will be used in transportation for the foreseeable future, operators will be continually challenged by the risks inherent to managing hazardous volatile organic vapours. From preventing workplace accidents to climate change, industry leaders must proactively seek out and adopt new technologies to become even safer, ever more efficient, and demonstrate long-term sustainability. Covid-19 has brought to the forefront the impact of fatigue and the importance of crew safety, something which banks and investors are increasingly seeing as a risk that can impact the financial viability of shipowners, well beyond standard regulatory compliance.

NanoVapor provides its customers with new technologies that can improve workplace health, safety, and operational efficiency with sustainable management of industrial organic vapours. NanoVapor's focus is to provide measurable benefits and business value for any enterprise involved in the production, transportation, or storage of oil and refined petrochemical products. Ecochlor is the distributor of NanoVapor for the maritime industry.



Comparison of degassing by air versus using NanoVapor

Key autonomy milestone with remote vessel operation trial

The harbour tug *Maju 510* was remotely controlled

Source: ABB

PORT OF SINGAPORE | ABB, together with Singaporean shipyard Keppel Offshore & Marine (Keppel O&M), has carried out South Asia's first remote joystick control of a tugboat in the Port of Singapore.

ABB and Keppel O&M technologies were retrofitted to the 32m-long harbour tug *Maju 510*. The vessel is owned and operated by Keppel O&M's joint-venture company Keppel Smit Towage.

With more than 130,000 vessels calling annually, the Port of Singapore presents one of the most complex settings for autonomous harbour operations in the world, ABB noted in a statement. The trial marks a major milestone in validating the increased safety and efficiency of tug operations utilising digital solutions already available today for nearly any kind of vessel, the company added.

The trial of remotely operating the harbour tug from a shore command centre located at the Maritime and Port Authority of Singapore's Maritime Innovation Lab was performed in April 2021. ABB has delivered an integrated system for the remote and autonomous control of the vessel based on the Ability™ Marine Pilot product family. The ABB Ability Marine Pilot Vision provided the sensor fusion from onboard systems to generate digital situational awareness, while the ABB Ability™ Marine Pilot Control system executed the necessary intelligent manoeuvring and control commands.

"We are proud to have reached another milestone representing a significant step towards autonomous shipping, in close collaboration with Keppel," said Juha Koskela, division president, ABB Marine & Ports. "The intent of this technology is to relieve the crew of tasks that can be automated, enabling them to perform at their best during critical periods and enhancing the overall safety and productivity of marine operations. This trial also confirms the possibility for application of remote and autonomous technology to other vessel types."

"Remote control navigation is an important feature of autonomous vessels as it acts as a safeguard and is especially useful in certain complicated scenarios. As the overall system integrator, Keppel O&M is leveraging its in-depth offshore and marine expertise and collaborating with the Keppel ecosystem of companies, such as M1 with its connectivity solutions, as well as other partners such as ABB who supplied leading-edge technology, to incorporate the best-in-class systems and offer customisable autonomous solutions. This is in line with Keppel's Vision 2030, which includes harnessing advanced technologies for growth," said Tan Leong Peng, managing director (New Builds), Keppel O&M.

"Keppel Smit Towage is pleased to support Keppel O&M and ABB in the development of autonomous tugs. As a tug operator, we leverage technology to improve our operations to serve our customers better. With the *Maju 510* as a pilot tug, we are able to experience and provide feedback on how autonomous operations can help the tug captain and crew in simplifying their navigation to focus on crucial tasks. This has the potential to significantly enhance operational safety and efficiency," said Romi Kaushal, managing director of Keppel Smit Towage.

The harbour tug project is funded by the Maritime and Port Authority of Singapore as part of the Singapore Maritime R&D Roadmap 2030 which charts out the nation's key focus areas for the development of the maritime industry, as well as research and technological capabilities. The second phase of the project, scheduled for late 2021, will see the vessel perform autonomous collision avoidance tasks while under remote supervision.

ABB has previously delivered technology for the trial of the remotely operated passenger ferry, *Suomenlinna II*, carried out in Helsinki in November 2018, proving that human oversight of vessels from any location is achievable using currently available technology.

New division to provide electric pusher tugs for inland waters

E-PUSHER™ SERIES | Rotterdam-based Kotug International BV has set up an Inland Shipping division to provide electric pusher tugs for operation on inland waters. The company will also use AI-driven dispatch and route planning software to support the transfer of cargo from road to water.

Kotug currently offers three tugs in the E-Pusher™ Series, powered by swappable energy containers using fuels including Stage V diesel, gas, biogas, hydrogen and batteries.

The vessels range from a 5.5m-long design to a 22m-long unit, with depths varying between 0.45m and 1.35m. This results in draught reductions of about 30% compared with conventional pusher tug designs, the company said.

For the most effective operation, Kotug will use OptiPort – automated dispatching software based on historical and real-time information linking port and terminal information with vessel operations. The system is designed to optimise expected and just-in-time arrival and departure times, as well as routeing and speed control, thereby minimising energy use.

The company has recently established Kotug CityBarge BV in partnership with Circle Line Logistics BV. The new setup has commissioned a 5.5m-long E-Pusher tug in the municipality of Leiden to provide a zero-emission option to heavy truck transport in cities. The aim is to improve inner-city environments by restoring existing waterways and using them for the transport of rubbish, construction materials, and retail products, Kotug said.

The E-Pusher series comprises various models

Source: Kotug

Digital condition and vibration analysis for car carrier

PERFORMANCE TRIAL | Geislinger GmbH and Metis Cyberspace Technology are to provide condition monitoring and data analytics for a pure car and truck carrier (PCTC) owned by Piraeus-based Neptune Lines. The system will measure and monitor rotating components in the ship's propulsion setup, combining condition evaluation from a Geislinger GMS Mk6 system with navigational and operational conditions analysis from Metis.

The digital service will provide information relating to the main engine vibration dampener both for the ship's crew and the company's technical department, signalling any abnormalities that could cause torsional vibration on the main engine and the propulsion shaft, the companies said.

The latest development followed Neptune Lines' move to implement the Metis analytics platform across its fleet late last year. At that time, the PCTC owner specified additional functionality, including emission indicator monitoring, and data on antifouling coatings performance, and generator operations in port.

The Metis and Geislinger collaboration is not resulting in a common product, but the companies explained that they are combining knowledge for different domains to connect two cloud-based platforms at the data and service level. A second trial of the system has now been confirmed for a VLCC.

Nikos Paterakis, Neptune Lines' COO, said: "We have made a commitment to data analytics to enhance efficiency as part of its service to the logistics industry. This pilot will offer insight into a key parameter in performance whose significance can be underestimated."

Metis Cybertechnology CEO, Mike Konstantinidis, commented: "For Metis, this is a significant evolution of shipping's most advanced end-to-end digitalisation platform, which integrates and displays the very best third-party digital services in a one-stop shop for vessel performance analytics. Sharing specific data benefits decision-making by adding value to analytics and bringing new insights into overall performance."

Speaking for the family-owned Austrian company, Adrian Geislinger noted the company's expertise in high performance drive lines. Clients in the marine sector were well aware of the benefits of dampening technology, he said.

Four years after it was set up, Metis data acquisition and analytics systems are now in use on board more than 270 ships, measuring about 3.2 billion performance data points every month.

Shock, vibration and motion tracking systems unveiled

VESSEL MONITORING | UK-based Dyena Systems has launched the Vessel Impact and Motion Monitoring System (VIMMS) to track the levels of shock and vibration incurred by vessels and their personnel during heavy weather and/or high speeds.

VIMMS has a helm unit and two remote sensors that measure accelerations on a vessel's structure and at the helmsman's seat.

Real-time information enables speed or course to be adjusted before certain limits are exceeded, thereby limiting the impact of shock and vibration on the vessel and its crew. A warning light comes on if an upper limit is exceeded and remains lit until the unit is reset by entering a pin number on the keypad, the company explained. The IP67 helm unit is only 150mm by 54mm and can easily be retrofitted to existing craft.

Dyena Systems managing director, James Glover, said: "VIMMS was developed in collaboration with Shockwave Seats to the US Coast Guard's specification, providing a system than directly meets their needs. The system is very simple to fit and works straight out of the box with a clear and intuitive display."

Sean Gerrett, Shockwave Seats sales manager, added: "With shock-mitigating seating, it is possible for the operator to drive a boat harder and faster, potentially increasing the risk of injury to crew or vessel integrity. With VIMMS, our customers can maintain operational oversight of the vessel, reducing the risk of injury to personnel and damage to their assets."

Separately, Dyena Systems has also introduced SeaTRAX, developed in collaboration with the UK's PD Ports and the Australian Reef Pilots. It is specifically designed for use by pilot boats during the transit and transfer phases. The seven-inch touch screen provides real-time information on vessel pitch, roll and heave, enabling the skipper to make an objective assessment of conditions and alter plans if necessary, the company explained.

PD Ports' Conservancy Operations manager, Andrew Ridley, commented: "Dyena SeaTRAX is installed on our latest pilot boat, *Stainsby*. This state-of-the-art vessel was built to our specifications to provide the best possible environment for the crew, and SeaTRAX gives the skipper real-time information, allowing them to adjust course or speed to improve fuel efficiency and crew comfort. Following our successful trials, we will be installing SeaTRAX across our fleet."

Source: Dyena

The VIMMS has been added to Dyena's range of vessel monitoring systems

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