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Subsea 7's **Seven Atlantic** (See Machinery)

VIEWPOINT:

With the upcoming regulations on sulphur and CO₂, we hear a great deal about various new fuels, especially LNG. However, it also looks as if bio-fuels will play a part in the future.

IKEA Transport & Logistics Services, CMA CGM, the GoodShipping Program and the Port of Rotterdam have announced the successful refuelling on Saturday March 23rd of the 65,930 dwt *CMA CGM White Shark* with sustainable marine bio-fuel oil.

The test, which represents a major step for the decarbonisation of ocean freight, saw the companies work together in a first-of-its-kind partnership for the shipping industry. The *CMA CGM White Shark*, a 5,095 teu containership, was refuelled with the bio-fuel oil while calling at Rotterdam.

Results from the trial will give the maritime sector a vital demonstration into the scalability, sustainability and technical compliance of sustainable marine bio-fuel oil.

This will benefit all industry stakeholders in their environmental strategies, in line with the impending IMO decarbonisation pathway.

The sustainable marine bio-fuel oil was developed by GoodFuels after undergoing three years of intensive testing with marine engine manufacturers. The second-generation bio-fuel oil is completely derived from forest residues and waste cooking oil products, is expected to deliver 80-90% well-to-propeller CO₂ reduction versus fossil equivalents, and virtually eliminates sulphur oxide (SOx) emissions - all without any requirement for engine modifications.

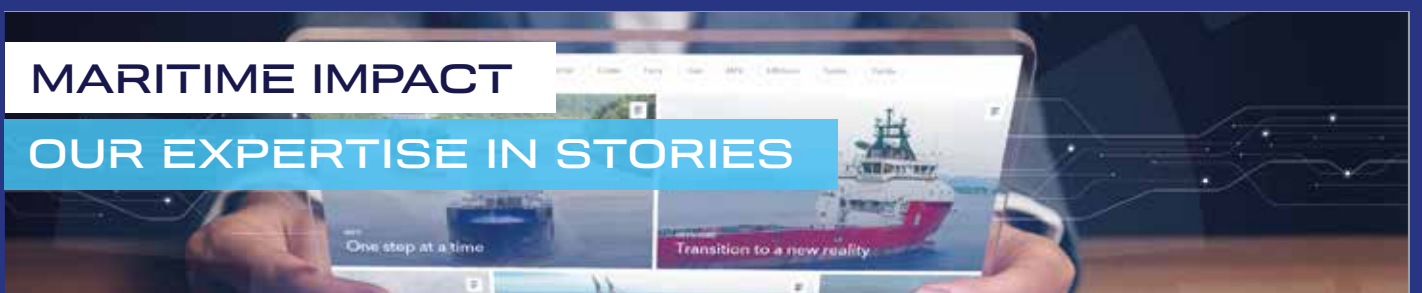
The trial was facilitated by the GoodShipping Program, a sustainable initiative dedicated to decarbonising ocean freight.

The *CMA CGM White Shark* in Rotterdam



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SHIPYARDS:

NORDMARIN:

The docking and survey of the 1,623 gt 2009-built anchor-handler **Seacor Oil** marks another key development at Dubai Maritime City (DMC)-based NORDMARIN LLC, recently established by veteran shipbuilder, repairer and marine engineer, Paul Friedberg. The deal is important for NORDMARIN because Seacor Marine is a leading offshore operator with a strong Middle East presence and an on-going requirement for vessel maintenance and repair services.

NORDMARIN, which underwent a rebranding following Friedberg's acquisition of GMMOSTECH Marine and Technical Services LLC in 2017, now lies at the heart of the Dubai ship repair community, having moved from Al Jadaf to DMC soon after Friedberg took control. He has wasted no time in reorganising the company and the results are clearly paying off.

Despite the fact that the new construction and repair market hit a low last year, with offshore business once again sharply down, NORDMARIN's financial performance in 2018 bucked the trend. Revenues over the year showed a 10% improvement on 2017 and the results of an aggressive sales and marketing campaign conducted over the first half of 2018 paid off well. Revenues in the second six months of 2018 increased by 50% compared with the first half. Meanwhile, an expanding customer base bodes well for the future. The number of customers in 2018 doubled from the previous year and notched up a 50% increase on the average number of clients over each of the last five years.

Friedberg is confident that these positive trends are set to continue. Increased activity evident during the second half of 2018 has continued through this year's first quarter and Friedberg has been expanding the workforce to meet the company's increasing pipeline of business. He now has about 130 staff on the books, an increase of about 15% since the beginning of the year. This is all a part of his corporate strategy in which a highly motivated workforce and new working practices are yielding significant efficiency gains. These, he says, are essential in a market where prices are under pressure and cut-throat competition is evident on every deal.

The company's specialised mechanical workshop has broad service capabilities but a particular focus on main engine and auxiliary components and propulsion systems, including thrusters. As an independent repair firm, Friedberg stresses the importance of close ties with specialist engineering companies for third-party verifications. As an expert in work procedures, Friedberg is well-placed to raise productivity and his workforce is responding well to the efficiency initiatives he has introduced.

He explains his strategy, "Since almost every ship repair or conversion project is unique and sometimes involves emergent works that were not expected, most people say that it cannot be planned and controlled in a systematic manner. Well ... this is not correct. At NORDMARIN, we have developed an in-house enterprise, resource, planning (ERP) system with associated routines and processes that ensure middle managers plan and meticulously control all aspect of a particular project.

"We believe that this is the only way to deliver a quality product on time and on budget, and with our required return on resources. However, it's not enough merely to have the system, the routines and the processes. It is essential for everybody involved in the company to embrace the right culture and understand the importance of one team pulling together at all times to ensure the very best quality and the greatest operating efficiency."

Friedberg's endeavours are paying off. Apart from the Seacor deal, NORDMARIN has recently been appointed as one of the US Navy's nominated contractors in the Arabian Gulf, a development which he sees as representing a big feather in the company's cap. The company has also become the contractor of choice for a large fleet of security vessels located off the coast of the UAE, Oman and in the Red Sea which protect large vessels navigating the dangerous waters of the Gulf of Oman, the Gulf of Aden and parts of the Red Sea.

Last year, the company completed the drydocking and refurbishment of two large security vessels, the

The NORDMARIN team on the shiplift in DMC



Markab and the **Menkar**, for Ambrey Risk and also undertook the drydocking and refurbishment of Sinbad Navigation's **Antarctic Dream** in January this year. Other Sinbad vessels are due to be docked in the coming weeks. Other recent work has included the reactivation of the **Gulf Pearl**, a well stimulation vessel, before she commences new contracts in Middle East waters. The drydocking of the 9,593 dwt tanker, **Red Sea 1**, has also been completed recently.

N-KOM:

Qatar's Nakilat-Keppel Offshore & Marine (N-KOM) has successfully completed its first FSRU project for the 138,000 m³ FSRU **Excellerate** owned by Excelerate Energy (USA).

During its period at the shipyard, the FSRU underwent routine drydocking and repairs, in addition to modifications and retrofitting of several new systems, including the installation of a BWM system. To date, N-KOM has completed seven BWM systems installations for various types of vessels, such as LNG and LPG tankers as well as VLCCs. The vessel is now ready to sail to Bangladesh to join Excelerate's FSRU **Excellence** in the Bay of Bengal and serve as the country's second LNG import terminal.

N-KOM's expertise in handling gas tankers has attracted many LNG tankers for routine docking, membrane repairs, and other repair and maintenance works at its facility. Located within the world-class Erhama Bin Jaber Al Jalahma shipyard, N-KOM has completed more than 190 LNG tanker drydocking and repairs to date, with around 30 projects undertaken in 2018 alone.

The shipyard's comprehensive facilities include three Q-Max sized docks (two graving docks and one floating dock), berthing capacity of 3,150 m, specialised workshops and cryogenic cleanrooms, enabling it to handle repairs and maintenance for all types of marine vessels and offshore structures. To date, N-KOM has delivered in excess of 900 marine and offshore projects in a safe, reliable and timely manner to clients from around the world.



APPLEDORE SHIPYARD:

Leading property consultancy JLL has been appointed to market the historic Appledore Shipyard site in Devon, which is now available following expiry of the existing lease.

Tim Western, lead director at JLL in Exeter, said, "Appledore Shipyard is an historic site of significant importance to the wider region and we recognise that finding the right tenant is crucial. We are targeting the global marketplace primarily in the marine, maritime and energy sectors, and our aim is to secure a new tenant for the facilities as soon as possible."

Appledore Shipyard dates back to 1855 and has built more than 350 vessels in its history, including military craft, bulk carriers, super yachts, ferries and oil industry support ships.

Bidna Yard and New Quay form the two parts of the available property covering around 28 acres. The main building includes an impressive 118 m long covered, drydock facility. The property is available on a new lease as a whole or in parts.

Tim Western added, "We have already received good levels of interest in Appledore from companies across the globe. It is evident that there is an undersupply of shipbuilding and ship repair facilities in Europe for small to medium sized vessels."



NAVANTIA:

Carnival Cruise Line's 101,509 gt 1999 built **Carnival Triumph** drydocked at Navantia's Cadiz facility on March 12th to begin a two month, multi-million US\$ upgrade project, after which the vessel will re-enter service renamed **Carnival Sunrise**. This is the second of three major upgrades projects awarded to the Spanish yard by Carnival – the Cadiz yard completed the upgrade of **Carnival Destiny**, renamed **Carnival Sunshine**, in 2018 and will carry out the same work package on **Carnival Victory** in 2020. This vessel will be renamed **Carnival Radiance**.


The upgrade project includes the redesign of passenger cabins, spa and leisure areas, restaurants, shopping area and children's spaces. This work will be undertaken by a number of Carnival appointed sub-contractors, while Navantia will support all logistics including the installation of a new duck tail to improve the vessel's fuel efficiency and steelwork for new deckheads and passenger cabins.

Meanwhile, to accommodate the army of sub-contractors working on this project the shipyard has chartered two vessels to act as accommodation vessels during the project – the cruise vessel **Gemini** and the ro/pax **Tanit**.

SEMBCORP MARINE ADMIRALTY YARD:

New Indian cruise line Jalesh Cruises took delivery of its first cruise vessel on March 12th in Singapore from P&O Cruises (Australia). The 70,310 gt 1990-built **Pacific Jewel** will now undergo a major upgrade at Sembcorp Marine's Admiralty Yard in Sembawang to ready the vessel for her new Indian cruise clientele before sailing to Mumbai under her new name **Karnika**.

During April/May **Karnika** will cruise between Mumbai and Goa, before operating cruises from Mumbai to the Middle East over the period May-September calling in Abu Dhabi, Bahrain, Doha, Dubai, Muscat and Sri Ban Yas Island.



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MACHINERY:

ROYSTON:

Work on overhauling diesel engines on one of the most advanced diving support vessels in the world, has been completed by power specialist Royston. Engineers undertook the 30,000 running hrs major service on the generator engines on-board Subsea 7's 17,496 gt, 140 m long **Seven Atlantic**, as part of a comprehensive refurbishment and maintenance programme of the critical power plant. The work was carried out alongside at Clipper Quays, Aberdeen. The 2009-built **Seven Atlantic** is one of the largest and most capable vessels of its type in the world. It operates a 24-person saturation diving system.

The work by Royston saw the Wartsila W7L32 diesel generator No.5 disassembled to install new cylinder heads, air start valves, indicator cocks, injectors, and cylinder seals. Relief valves, pistons and conrods, cylin-

der liners, bearing blocks, crankshaft and turbocharger were all sent to company's Newcastle work shop for checking and essential repair work before being returned ahead of the final reassembly and inspection of the engine. Engineers also overhauled the turbocharger on the Wartsila W7L32 diesel generator No.3. Requiring 12,000 running hrs overhaul, the NA297 Napier turbochargers from both engines were removed, stripped, cleaned, inspected and balanced at Royston's specialist test and repair facility, which features a Schenk H3BU horizontal balance machine alongside an IRD B5OU-290 instrument as part of a precision instrumentation capability to increase balance testing. Following completion of the servicing work, incremental load testing in line with the engine manufacturer's specification was also completed by engineers.

Shawn Doering, Royston's service manager on the contract, said, "Our experience with the engine and vessel type ensured the work was carried out efficiently and effectively, enabling the vessel to return to sea-going operations as quickly as possible.

"Vessel operators can save upwards of 30% when using service providers like Royston without compromising the quality and standard of engineering work provided."

Seven Atlantic's power plant package comprises six Wartsila 7L engines, each driving a 3,360 kVA Van Kaick generator, generating 6.6 kV (mains voltage). The propulsion installation runs on marine gasoil to provide power for propulsion, dive systems, crane activities and other consumers.

SEAKING ELECTRICAL:

Birkenhead's SeaKing Electrical has completed a series of upgrades to three DFDS ferries at Damen Shiprepair Dunkerque (DSDu). The package of work was delivered to short ferries including the 35,923 gt sisterships - **Dunkerque Seaways**, **Dover Seaways** and **Delft Seaways** operated by Danish shipping company DFDS, in a total of 30 days.

SeaKing Electrical managing director Dave Gillam said the project follows work delivered in Autumn 2018 to the passenger and car ferries which operate in the English Channel between Dover and Dunkerque.

"Each vessels 10-day drydocking saw an intense period of planned upgrade work to Deck six restaurant areas," said Mr Gillam. "A key element included an overhaul to lighting and the removal of electrical apparatus in order to install four new Uninterruptible Power Supply (UPS) so that each engine has its own dedicated UPS. The UPS differs from auxiliary or emergency power systems or standby generators in that they provide near instantaneous protection from input power interruptions, by supplying energy stored in batteries. The UPS were installed in the Transformer Room which is a challenging area to operate due to space restraints and multiple enclosed sections aft of the main engine room. The team also fitted four ABB HMI (Human Machine Interface) systems in the Motor Control Room.

"This latest upgrade for DFDS Seaways follows a four-week project delivered in Autumn last year which saw a 10-man team delivering electrical upgrades to entertainment systems in 80 cabins and the fitting of VDSs (Variable Speed Drives) to car deck vent fans. In both instances SeaKing was required to work to tight time scales across multiple vessels. This required careful planning and strict project management. Our on-going work with DFDS showcases SeaKing's ability to consistently deliver on time and to budget. We have a team of more than 70 highly experienced engineers who can travel anywhere in the world to solve complex electrical engineering challenges involving any marine vessels."

SeaKing works in shipyards across the UK, Europe, Asia, America and Caribbean covering many segments of the marine sector. Since setting up 2001 it has developed a strong track record supporting high-profile military contracts, including work on both Queen Elizabeth-class aircraft carriers, and a series of Royal Fleet Auxiliary vessels.

Mr Gillam said the firm's broad experience across the military and commercial sector has enabled it to diversify. "Over the years our close connection with neighbouring shipyard Cammell Laird, and in particular work on high profile military contracts, has encouraged a culture of continuous development and stringent internal management systems. This has enabled us to grow, develop and secure greater volumes of work

DFDS' *Dunkerque Seaways*



in other areas including cruise ships, ferries and superyachts. In 2018 we completed projects on 26 superyachts alone.

“We continue to see great potential in the ferry and cruise market for our complete marine electrical engineering service. This includes design, manufacturing, installation and maintenance. Typical areas which need attention in this subsector include thruster systems, radar and navigation, generator synchronising, distribution boards and steering gear feedback systems. Our role frequently involves constructing, modifying and refurbishing marine electrical control equipment. We also offer fault finding and repair services with all our marine installations meeting SOLAS requirements.”

SCHOTTEL:

The **Paul Candies**, a new Inspection Maintenance Repair (IMR) vessel built by Candies Shipbuilders and owned by its parent company Otto Candies, LLC, is equipped with three different SCHOTTEL propulsion systems. Its two Combi Drives, two transverse thrusters and one retractable rudderpropeller ensure maximum manoeuvrability and a high free running speed for the US-flagged IMR vessel.

Due to two type SCD 560 STP SCHOTTEL Combi Drive azimuth thrusters the diesel-electric vessel reaches a speed of 14 knots. The 2,600 kW SCD 560 STP features the proven SCHOTTEL twin propeller concept. By sharing the load between two propellers, this concept increases propulsion efficiency and reduces fuel consumption over single propeller systems. Beyond this, two type STT 5 FP bow thrusters (each of 1,050 kW) and one 800 kW type SRP 260 R FP retractable bow thruster ensure precise and high manoeuvrability in DP mode.

“We have relied on SCHOTTEL products for many years. Several of our vessels are equipped with propulsion systems from SCHOTTEL – some even with the electric Combi Drive,” states Otto B. Candies III, Vice Chairman at Otto Candies, LLC. “As a result of the very good performance of the azimuth thrusters and the reduced service and maintenance efforts, we have once again decided in favour of SCHOTTEL’s Combi Drive.”

Otto Candies, LLC deploys the MT6020 Marin Teknikk design vessel in the worldwide offshore industry. The 101.25 m long and 20.60 m wide vessel is named after Paul Candies, the long-time President of Otto Candies, LLC. **Paul Candies** joins the other 42 vessels in the Otto Candies, LLC fleet.

With the SCD L-Drive design principle, the electric motor is integrated vertically into the Rudderpropeller, resulting in a highly efficient variant of the SRP and STP propulsion units. The elimination of the upper gearbox has numerous advantages such as reduced mechanical losses, low noise and vibration levels as well as fewer maintenance requirements. The SCD therefore features a very compact thruster which offers approximately 20% space savings compared to Z-Drive installation. This gives additional room for further equipment and fits vessels with limited deck height perfectly.



The **Paul Candies**

WÄRTSILÄ:

A benchmark installation of three energy storage systems by the technology group Wärtsilä on-board an offshore construction vessel features, for the first time ever, energy and load sharing capability. The system combines a diesel-electric configuration with batteries, and is designed to deliver impressive fuel savings for the ship of as much as 50%, given optimal operating conditions.

The installation was carried out in February 2018 on-board North Sea Shipping’s 18,151 gt **North Sea Giant**, one of the world’s largest and most advanced subsea construction vessels. In a second phase of the project, Wärtsilä commissioned an electronic bus link, a newly developed module that allows the ship to share load and energy optimally between the three Wärtsilä energy storage systems. This technology is expected to generate additional operating cost savings, and a total reduction in annual fuel consumption of 2m litres. The estimated annual reduction in exhaust emissions is 5.5m kg of CO₂, 30 tons of nitrogen oxides (NOx), and 1,200 kg of sulphur oxides (SOx).

“This is a forward looking solution that offers both cost and environmental benefits, including less mainte-

nance, reduced fuel consumption, and fewer exhaust emissions. In addition, it promotes more efficient and safer operations for the ship. We are confident that the positive impact of this solution will eventually be felt throughout the industry," says Sindre Utne, General Manager, Wärtsilä Project Centre, Norway.

"The project has been driven by our focus on reducing the environmental impact of offshore oil-related operations in the North Sea. The advanced Wärtsilä energy storage system is important, because of both the favourable fuel consumption as well as its sustainability. Seabed installations are increasingly moving further north into very sensitive environmental areas, which makes this system extremely relevant," says Hallvard Klepšvik, CEO of North Sea Shipping AS.

The three Wärtsilä energy storage systems reduce load fluctuations on the ship's diesel generators. Typically, vessels utilising dynamic positioning require two or more engines operating simultaneously at low load to secure back-up power. By using the Wärtsilä hybrid battery system to provide the needed reserve power, the operational engine can be run closer to its optimal load point.

The North Sea Giant



HAVYARD:

Norway's Havyard has delivered the **Giskoy**, the third battery-run ferry for the Hareid–Sulesund route to Fjord1, and the Sula fjord is thereby ready to become a green fjord.

In order to deliver ferries with extremely low energy consumption, Havyard has developed digital ferry models and incorporated them into a 'digital Sula fjord' made with unique weather data from the area.

The Norwegian Public Roads Administration has invested over NOK100m in measurement masts and buoys in the Sula fjord. These provide data about wind, current, temperature, wave height and wave length that Norwegian researchers have not previously had, and that provide a unique insight into a fjord.

Havyard uses these data in its work on developing the new ferries that are set to cross the Sula fjord. R&D Manager Kristian Steinsvik explains that they have used the data on weather, wind, currents and waves to digitally recreate the conditions in the Sula fjord. In this virtual test tank of a fjord, a digital model of the ferry was tested, among other things to optimise the shape of the hull. The process also includes variables related to the ferry's operation profile with many and frequent dockings.

"In this way, we have managed to develop ferries with extremely low energy consumption using a battery system that is not only designed for fair weather, but that also enables fully-electric operation in rough weather."

The planned battery-operation of the ferries on the Hareid–Sulesund route will reduce CO₂ emissions by about 90% when compared to them running on traditional fuel. This is a reduction of almost 8,000 tonnes of CO₂/year.

Havyard Group has had a long-term systematic focus on development work related to optimisation of hull lines and energy consumption. Using its own calculation cluster as its virtual test tank, it has over time delivered increasingly green vessels for offshore operations, support vessels for wind farms, a record number of ferries, and now also the design for the Kystruten coastal route.

CEO of Havyard Group Geir Johan Bakke says that the calculation methods and virtual testing of models against weather, wind and wave data have gone a long way in optimising the vessels and cutting energy consumption.

"Our goal has been to develop a realistic model that recreates what we see in real life, and we are constantly receiving confirmation that the modelling is in line with reality when the vessels are put into operation. This way of working is good news for both our customers and the environment."

The ferries that are set to run the Hareid–Sulesund route this winter are the first three in a long line of fer-

ries where Havyard Group has delivered the design, propulsion, bridge solutions and ferry construction.

The ferry deliveries make Havyard the biggest and leading player in the green shift on the Norwegian fjords and thereby in the world. In the marine equivalent to the Paris Agreement entered into last spring under IMO nations agreed to halve the total marine greenhouse gas emissions by 2050.

“This sets the guidelines for the authorities, our customers and ourselves, but these ferries and the work we have conducted and will conduct with Kystruten shows that we can meet the requirements by a good margin, as seen here with our ferries cutting emissions by 90%.”

The ferries crossing the Sulafjord transport 120 cars with the same power drain consumption as eight or nine medium-sized electric cars.

“As a bonus, on this route, all the cars on-board could be called ‘electric’ cars, since they are transported using electrical power and batteries.”

The third battery-run ferry for the Hareid–Sulesund route was delivered today. The planned battery-operation of the ferries will reduce CO₂ emissions by around 90% when compared to them running on traditional fuel.



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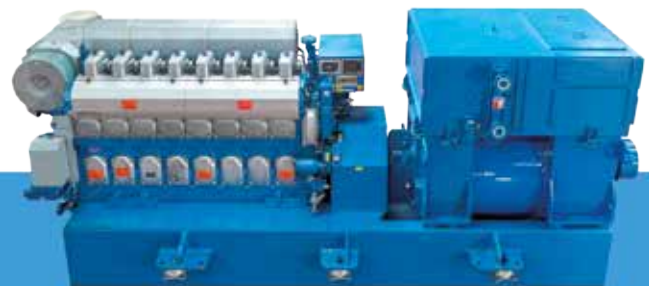
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DESIGN:

WÄRTSILÄ:

Finland’s Wärtsilä has been awarded the contract to design a state-of-the-art multipurpose transport vessel that will operate in Antarctic waters. Wärtsilä will also provide the vessel with a comprehensive package of integrated propulsion and hybrid solutions to ensure highly efficient and environmentally sustainable operations. The ship has been ordered by Norway-based Aker BioMarine and will be constructed in China, at CIMC Raffles. The ship design order with Wärtsilä was booked in December 2018, while the order for the integrated solutions package was booked in March 2019.

The 168 m long, 20,300 dwt vessel will comply with IMO’s Polar Code. Because it will operate in the environmentally sensitive Antarctic, Wärtsilä’s sustainable technical and hybrid solutions, with high levels of safety and reliability, were considered as being the most suitable for this project.

“We are proud to have been selected to design and equip this ship. It will be a customised vessel designed specifically to meet the owner’s operational requirements in a challenging environment. It emphasises once again Wärtsilä’s comprehensive strengths and capabilities, as well as our broad offering to the marine market,” says Lilli Chi, Managing Director, Ship Design, Wärtsilä Marine.

“Protection of the environment is an absolute essential for us, and the design of this vessel has sustain-

ability as a primary focus. It incorporates the latest energy saving and environmentally friendly technologies, such as the hybrid propulsion system, and an advanced heat recovery system that helps to reduce the carbon footprint even further," says Eldar Vindvik, Director Fleet Renewal at Aker BioMarine.

The new vessel will be powered by Wärtsilä's Wärtsilä 31 engine, recognised by Guinness World Records as being the world's most efficient 4-stroke diesel engine. Two Wärtsilä 20 engines will provide the auxiliary power. The engines will all be fitted with Wärtsilä's NOx Reducer (NOR) to prevent nitrogen oxide emissions when in diesel mode. Wärtsilä will also deliver the power distribution system, including hybrid drives and a battery package, the gearbox, controllable pitch propeller and thrusters.

A Wärtsilä Nacos Platinum Joystick system will be supplied to enhance the efficiency and safety of the ship's operations. To ensure optimal system performance and energy utilisation, the integrated solution is controlled by Wärtsilä's power and energy management system and propulsion control.

The ship will carry supply goods and liquids, as well as krill products from krill harvesting vessels working in the Antarctic area. For this, an innovative cargo handling system has been developed. The vessel is expected to be ready for the 2021 harvesting season.

The new state-of-the-art Aker BioMarine support vessel is designed by Wärtsilä and fitted with an integrated package of propulsion and environmental systems.



IMAREST:

Environmental responsibility, particularly in respect of NOx, was the focus of attention for over a hundred members of the shipping industry who attended a UAE branch technical meeting of the Institute of Marine Engineering, Science and Technology (IMarEST) on March 14th, when Magdolin Mikhail, Upstream & Design Manager, Cummins presented 'Evolution of emission regulations and new technologies to support the marine industry'.

Many attended conscious of the fact that deadlines on emission regulations loom - IMO has designated the Baltic Sea and the North Sea as ECA for NOx for ships with keel-laying on or after January 2021. During the meeting Magdolin Mikhail highlighted not only key dates, but the following facts about NOx:

IMO Tier III levels are currently in force in NOx Emission Control Areas (NECAs) within 200 nautical miles from the North American and US Caribbean shores. These requirements are applicable to all new build vessels (400 gt and above) or a retrofit project involving installing an engine with a power output of ≥ 130 kW and LOA ≥ 24 m. NECAs will increase in future therefore there is no one effect date for IMO Tier III globally.

Emissions from ships in EU waters are to some extent limited by regional and global regulations as EU and its Member States have a strong preference for a global approach led by IMO.

Nikeel Idnani, Honorary Secretary of the IMarEST UAE branch who presided over the meeting said, "Environmental responsibility is a priority for IMO - and the shipping industry is actively engaged in trying to reduce its carbon footprint. It was an eye-opening experience for all who attended the meeting, to see how Cummins map out effective solutions to the challenges of MARPOL and help customers navigate current and future regulations.

"The 108 ship owners/managers, executives from shipyards, engineering firms, oil & gas exploration and services companies, suppliers/service companies, marine consultants, independent surveyors, classification societies managers, inspectors from regional Flag administrations & Port officials from the Middle East were truly captivated by the presentation, and once Magdolin came to the end of her presentation there was

The main participants in the IMarEST meeting - Magdolin Mikhail is second from the left in the front row



an almost never-ending stream of questions from the floor. Discussions continued during the networking event that followed”

“It is through technical meetings like these that the IMarEST promotes its mission to work with the global marine community to promote the scientific development of marine engineering, science and technology. We provide opportunities for the exchange of ideas and best practices and uphold the status, standards and expertise of marine professionals worldwide.”

OFFSHORE:

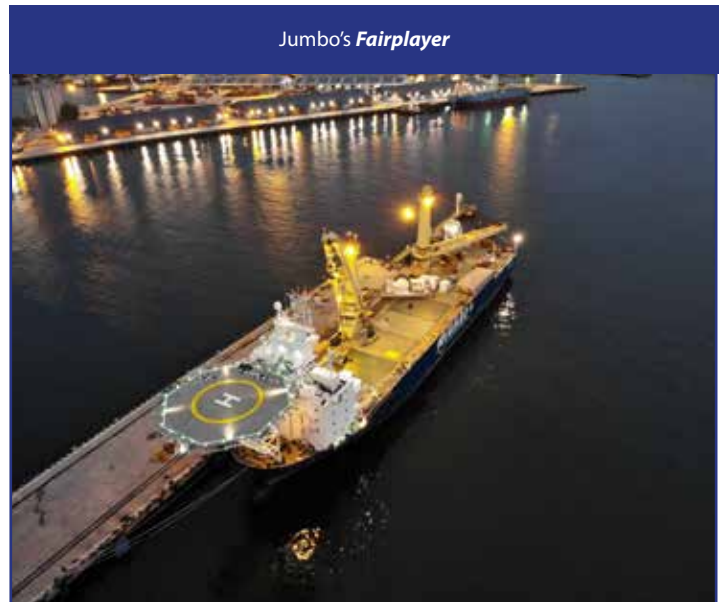
JUMBO:

Holland’s Jumbo has been awarded an offshore decommissioning project in the North Sea by TAQA Energy BV, involving the removal, transportation and disposal of three subsea protection domes and piles.

The removal operation will take place in the offshore series of fields located in the P15 block 35 kms North West of Hoek van Holland, Dutch North Sea, at a water depth of 26-28 m.

This project is part of the emergent North Sea decommissioning programme, where much of the offshore oil and gas infrastructure is reaching the end of its productive life and must be safely removed and disposed.

Jumbo’s heavy lift vessel **Fairplayer** is the vessel chosen to execute this project in 2019/2020. The team will recover and transport three subsea protection domes, each with a dry weight of 150 tonnes, as well as removing nine piles. The pipelines and umbilicals at each dome will be buried with mattresses. By removing and transporting the structures to shore on one heavy-lift crane vessel, Jumbo can provide the ideal cost-efficient, reliable and safe decommissioning solution.



PAINTS & COATINGS:

NIPPON PAINTS:

Nippon Paint Maine (Europe) has reported a 35% increase in consolidated sales as it looks to strengthen its position with new marine coating products and expansion into new geographical areas and market sectors.

Since it was established in 2016, Nippon Paint Marine (Europe) and its 100% subsidiary Nippon Paint Marine (Turkey) has seen 'considerable growth in sales' due in part to the market success of its fuel-saving A-LF Sea anti-fouling product, particularly in the LNG/LPG and cruise vessel segments.

Michel Wilckens, Managing Director, Nippon Paint Marine (Europe) GmbH, said, “Since the market introduction of our unique low friction, hydrogel-based coatings in 2007, more than 3,000 vessels have been applied with this unique marine technology. We anticipate further growth as more ship operators apply the technology as a way of reducing fuel consumption to meet new emissions regulations.”

Increased interest has also been registered for NPM’s speciality products such as the solvent free, fibre-reinforced epoxy mastic EPOBARR - Neoguard Toughness, an abrasion resistant, easy-to-clean epoxy for cargo tanks - and the recently introduced Aquaterras, the world’s first and only biocide-free SPC anti-fouling.

“Nippon Paint Marine has long been at the forefront of marine coatings technology,” said Wilckens. “With the introduction of Aquaterras, we can provide shipowners and managers with an anti-fouling product

Nippon Paints’ Michel Wilckens (left) and John Drew



that is not only free of biocides and heavy metals but can also further reduce fuel consumption through its ultra-smooth surface.”

John Drew, Director, Nippon Paint Marine (Europe) GmbH, said, “Aquaterras has now been applied to a number of vessels in the cruise, containership and bulker markets and we are keen to establish this unique coating across new geographical sectors, such as the Middle East.

“The Middle East Area has become an important focal point for our customers, especially following the rapid increase in drydock capacity. In order to strengthen our regional presence and improve product availability and technical services Nippon Paint Marine (Europe) will open a new sales and distribution office in the UAE, later this year.”

BALLAST WATER MANAGEMENT:

BIO-UV:

France’s BIO-UV Group has signed a contract to supply its BIO-SEA BWM system for installation aboard two World-class cruiseships currently under construction for MSC Cruises at the Chantiers de l’Atlantique shipyard at St. Nazaire, France.

The contract, which includes an option for an additional two World-class vessels, represents the 5th and 6th BIO-SEA BWM systems ordered by the Swiss-Italian owner, the world’s largest privately-owned cruiseship operator.

The first two World-class vessels, scheduled for delivery in 2022 and 2024, respectively, will be MSC Cruises’ first cruiseships configured to use LNG as a marine fuel.

They will each be fitted out with one BIO-SEA B02-0300 skid-mounted unit capable of treating ballast water flows of 300 m³/hr. The BIO-SEA skids will also feature an embedded power management cabinet for ease of operation.

Similar units will be supplied for installation to two new Meraviglia-class vessels, of which the most recent, **MSC Bellissima** has just been delivered. In total four Meraviglia-class cruiseships operate the BIO-SEA system.

Benoît Gillmann, BIO-UV Group’s President and CEO, said, “We are delighted that MSC Cruises has again selected BIO-SEA for treating the ballast water aboard its new cruiseships. The order follows the success of the installation and operation of similar units aboard MSC’s Meraviglia-class of cruiseships. When the first 200,000gt World-class vessel enters service in 2022, it will be the largest cruiseship in the MSC fleet.”

In addition to MSC Cruises, another cruiseship owner to favour the BIO-SEA technology is RCCL-brand Celebrity Cruises. A 250 m³/hr flow rate capacity BIO-SEA unit has been selected for an additional three Edge-class vessels, also building at Chantiers de l’Atlantique. One unit is already in service on-board the **Celebrity Edge**.

Xavier Deval, BIO-UV Group’s BIO-SEA Business Director, said, “MSC Cruises and RCCL have selected the BIO-SEA technology for its proven performance and user-friendly interface. BIO-SEA has the shortest holding time at full flow of any BWM system in the market. This is of primary importance for cruiseships as they visit a new port every day and consequently carry out ballasting/deballasting operations frequently.”

The recently-delivered **MSC Bellissima** operates the BIO-SEA system



ABS:

ABS has published its updated Best Practices for Operation of BWM systems report, offering fresh insight on best practices to overcome key challenges with selecting, installing and operating a BWM system.

First published in 2017, the updated 2019 Report captures the key discussion items, lessons-learned and valuable insight gathered and shared during its global program of industry workshops, shaped by question-

naires from owners and operators of vessels with BWM systems.

“Our engagement with the industry has helped us gain a deep understanding of the challenges from around the globe, which we used to develop and enhance our guidance to industry,” said Derek Novak, ABS Senior Vice President for Engineering and Technology. “Working closely with owners and operators we produced detailed best practices for mitigating and minimising issues with the installation and operation of BWM systems.”

To form an accurate picture of the current progress with BWM compliance, ABS held global workshops in New Orleans, Shanghai, Hong Kong, Singapore and Athens, reaching more than 60 shipowners and operators and about 500 vessels. Workshop attendees reviewed the best practices that support successful BWM system integration, exploring both common and unique challenges resulting from different applied technologies, various ship types and sizes, operational and environmental conditions, operating frequency, crew competencies, BWM system maintenance requirements and feasible contingency measures.

“Between 2017 and today, we have seen an increasing number of early adopters attempting to operate systems before required compliance deadlines,” said William Burroughs, ABS BWM Lead. “With the increased number of owners experiencing problematic operations due to system design limitations, we expanded our focus to cover practical contingency measures.”

Key insights gained during the workshops and captured in the comprehensive questionnaires include:

- Incorporating ship-specific contingency measures within the BWM Plan helps avoid potential downtime and financial penalties
- System-specific training, both for shoreside support and vessel crew, is critical for effectively operating and maintaining a BWM system
- Monitoring key data and operational trends and understanding system design limitations helps crew determine the suitability of the treatment technology for a vessel’s planned operational routes
- Providing after-sales global vendor support and expertise is critically important for uninterrupted BWM system operation.



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INERT GAS:

ALFA LAVAL:

An Alfa Laval Smit Combustion system (FU type) is now installed at the Alfa Laval Test & Training Centre in Aalborg, Denmark. The system, which adds inert gas production to the centre’s already comprehensive range of full-scale vessel applications, will ensure that Alfa Laval remains at the forefront of developing and optimising inert gas systems.

Inaugurated in 2014, the Alfa Laval Test & Training Centre is essentially a full-sized machine room on land, with equipment from all of Alfa Laval’s marine product groups installed in process lines as they would be on a commercial vessel. To support a focus on gas applications and combustion technology, the testing space underwent a major expansion in 2017, which added 1,100 m² and a gas fuel supply. The new Smit Combustion system fits neatly into that expansion, where flame tests and other activities are underway with the Alfa Laval Gas Combustion Unit (GCU) and multi-fuel Alfa Laval Aalborg burner systems.

Inert gas production is needed on ships that carry oil and gas products, where the inert gas replaces

oxygen in the cargo space to ensure a non-combustible atmosphere. The gas is pumped into the cargo tanks during off-loading, for tank inspections or in order to maintain tank overpressure. Alfa Laval has produced inert gas generators for marine use since 1967, and their built-in scrubber technology – used for cleaning the inert gas – laid much of the groundwork for today's Alfa Laval PureSOx exhaust gas cleaning systems.

Most versatile among Alfa Laval's different inert gas generators, the Smit Combustion system is a low-pressure inert gas solution based on the unique Smit Ultramising principle, which produces soot-free inert gas even when operating below stoichiometric conditions. The system installed at the Alfa Laval Test & Training Centre is capable of running at full load, producing up to 2,500 m³/hr of inert gas with low (5%) oxygen content. It is also fitted with the Automatic Fuel Efficiency Module (AFEM), which provides up to 40% fuel savings by adjusting the amount of fuel oil and combustion air to the current demand.

In preparing the new permanent installation, Alfa Laval has made every effort to recreate on-board conditions and simulate tank pressure. The Smit Combustion system is complete with seawater cooling, delivery valve, purge valve and deck water seal, and it allows stepless adjustment of parameters such as oxygen content, supply pressure and capacity.

"Having a Smit Combustion system at the Alfa Laval Test & Training Centre is an opportunity to test product innovations and improvements in a true-to-life environment, where we can simulate things like high seawater temperatures or variations in tank pressure," says Marko Van der Smitte, Sales Director Inert Gas Systems at Alfa Laval. "In addition, it lets us provide hands-on training or present and explain the system to customers in a real operating context."

"One of the main ideas behind the centre is to examine not just individual equipment, but all of the complex interactions on-board a vessel," Van der Smitte continues. "So adding an inert gas production system is a key step that makes the centre even more complete."

The Alfa Laval Smit inert gas system in Alfa Laval Test and Training Centre



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LNG:

BAKKER SLIEDRECHT:

Bakker Sliedrecht has been the first to develop a generator protection system (CDG-protection) for dual fuel vessels which operate with a dynamic positioning system (DP) 2 and 3. The system has been successfully tested by classification society DNV GL.

The Common Diesel Generator protection system the system integrator developed will be deployed for the first time on an offshore heavy lift vessel, which is currently under construction. The ship is equipped with a power plant of four generators of 10 MW each, which run on both diesel and LNG. Generator protection is essential to prevent a blackout or failure in the power plant, causing the ship to lose its position during operations.

Vessels that sail in DP 2 or 3 mode have to maintain their position at all times, even in case of failures or malfunctions in the fuel system, a diesel, a generator, the switchboard, or the control system. To prevent such malfunctions power plants are usually divided into independent isles.

However, this makes generators run inefficient which is undesirable cost- and environmentally wise. That is why ships nowadays prefer to operate with generators in parallel operation.

To prevent these from interfering with each other, a generator safety system is necessary. Bakker Sliedrecht's CDG-protection system uses software to detect and disable an 'unhealthy' generator before it can affect the 'healthy' generators, making the entire power plant unstable. For power plants equipped with dual fuel generators, this is extra complex because dual fuel engines behave differently than diesel engines and can unexpectedly switch from gas to diesel.

Without generator protection, a complex DP vessel will therefore not receive a certificate to operate in DP2 or DP3 closed bus mode. Bakker Sliedrecht started in 2017 with the further development of its own CDG protection system for complex work vessels. The system is now so far developed that it can be deployed in the heavy lift vessel. During the last months, it has been extensively tested in a test set-up of four generators. The system had been tested against the requirements as formulated in the 'DNV GL Rules: DNV-RP-D102 closed busties' with underlying rules 'Part 4: Ch8 Electrical installations & Ch9 Control and monitoring systems'. The system has passed these tests with flying colours even under dual fuel conditions.

According to the classification society, the heavy lift vessel will be the first dual fuel DP2 ship to be classified with a generator protection system. "So you can say that we are ground-breaking. Our technology will prevent the ship from getting out of position," says Paul Bracké, technology manager of Bakker Sliedrecht.

"That requires not only the first dual fuel generator protection system, but also a good power management and zone security system, including an experienced operator. Bakker Sliedrecht was able to combine all the required knowledge and has therefore achieved a world-class result."

HØGLUND:

Høglund, the leading global marine solutions and system integration expert, has announced that it has been awarded a contract to deliver biogas-ready fuel-gas supply systems (FGSS) for six Hurtigruten passenger ship retrofits.

Høglund will work together with HB Hunte Engineering to design and engineer fully customised tank and FGSS solutions for each of the six vessels, optimised to run on both LNG and liquified biogas (LBG).

Hurtigruten, a leader in the Arctic and Antarctic expedition cruise segment, will use Høglund and HB Hunte's bespoke FGSS solutions in tandem with large battery packs on-board its vessels, replacing its older engines which run on marine gas oil.

Høglund Gas Solutions, operating out of Hamburg, will provide a completely customised and integrated FGSS solution including process design and related automation. HB Hunte will provide mechanical gas engineering and gas tank design. The unique offering will also include overall project management and 24/7 after-care support from Høglund's dedicated team of experts.

The project will mark the first time a large passenger vessel has been converted to run on LBG - a fossil-free, renewable gas produced from organic waste, such as food waste – including, notably – rotting fish. The difficulty of converting an existing passenger vessel and meeting the necessary safety requirements for tank placement demands highly specialised design and engineering.

Peter Morsbach, Director Projects, Høglund Gas Solutions, said, "We are tremendously excited to be in-

involved in such a forward-looking project, which will undoubtedly set a new benchmark for low-carbon emissions in the rapidly evolving cruise sector.

“With 25 years of experience in the field of marine automation and system integration, Høglund has an unrivalled track record in creating gas control and safety solutions, and has already proven itself adept in creating systems that can keep pace with the rapid development of the LNG-fuelled fleet.

“However, as the global fleet continues to grow and diversify, industry-wide collaboration will be vital in delivering the gas solutions required to provide safety and reliability in the long term. This project is a perfect example of the challenges the change in the sector presents. HB Hunte’s unique skill set and experience in the field of mechanical and detail gas engineering will help us to turn our bespoke concepts into tangible solutions, customised to meet the exact needs of our client.

“Hurtigruten’s commitment to the environment and the long-term prosperity of the cruise sector marries well with Høglund’s own vision and values, and we look forward to supporting them in their ambition to become the world’s greenest cruise company.

Frerk Brand, Managing Director, HB Hunte, commented, “When it comes to retrofitting, a passenger ship is fundamentally different to any other vessel, mostly because of the size and complexity of their design.

“Due to the number of people on-board, a strong focus on safety will be vital throughout this project, as will the ability to work quickly and efficiently as any retrofit involves taking the ship temporarily out of service. All of this takes a tremendous amount of skill and dedication.

“Our partnership with Høglund will allow us to not only overcome these challenges, but to build something that is truly unique and built to last. We created an optimised tank design for the series of six vessels, combining state-of-the-art technology with an innovative shape including proven reliability and safety specifically designed for Hurtigruten’s fleet of ships.”

One of the Hurtigruten ships



DAMEN:

During mid-March, a ceremony was held at Damen Yichang Shipyard, China, to mark the start of cutting steel for the first of a planned series of short-sea LNG Bunker vessels to be built for Eesti Gaas of Estonia. The 6,000 m³ capacity vessel and its future sister-ships are intended to accelerate the wider adoption of LNG as a cleaner alternative fuel in the north-eastern region of the Baltic Sea by providing a mobile and efficient ship-to-ship distribution service for the first time.

At the ceremony the first sections of the 100 m, LGC 6000 LNG class vessel were cut from 8 mm steel plate and will eventually be part of the wall separating the ship’s engine room from the tank hold. Assembly will start in May with the installation of the LNG tanks scheduled for November. Following sea trials, the ship will arrive in Estonia next summer and will start serving LNG clients in the autumn. The new vessel will be capable of carrying out bunker activities at designated locations both in and outside ports.

The LGC 6000 LNG is designed to meet the requirements of ICE class 1A certification, allowing her to operate all year in the Gulf of Finland and the northern Baltic. She will also achieve green ship notation. A dual-fuel propulsion system will be used for the management of the Boil-Off Gas (BOG) in combination with a gas burner, and the interior of the vessel will feature high-quality accommodation for her crew.

An artist’s impression of the Damen LNG bunker vessel



Eesti Gaas will operate the vessel under a long-term charter from its parent company Infortar AS. Since 2016, Eesti Gaas has expanded its LNG transport and bunkering capacity by entering long-term LNG supply contracts with shipping companies and industrial consumers. Over time, as the adoption of LNG as a marine fuel gains momentum, it is anticipated that additional LGC 6000 LNG vessels will enter operation.

“The start of steel cutting for this brand-new vessel for Infortar marks an important milestone in the start of her construction,” said Peter Anssems, in his speech at the steel-cutting. “We are very grateful to Eesti Gaas and Infortar for choosing Damen to build their new LNG bunkering vessel. This newbuilding project is also an excellent example of the co-operation between China and the Netherlands and underlines the capabilities of Damen Yichang Shipyard as a builder of sophisticated vessels.”

“With this high-tech joint venture, Eesti Gaas and our launch client ferry-operator Tallink will ascend to having the title of the LNG companies with the most competence and experience in this region,” said Kalev Reiljan, a member of the management board of Eesti Gaas. “Eesti Gaas has performed over 1,500 port-based LNG truck-to-ship refuellings of Tallink’s LNG-powered Megastar ferry and now we are moving on toward offshore, more mobile solutions.” This project is co-funded by the EU through the CEF Transport programme.



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SURVEYS:

BUEREAU VERITAS:

MAC, a Bureau Veritas (BV) company and Kongsberg Maritime have successfully tested a new solution for DP system performance and redundancy audits deployed on a Bourbon vessel – the **Bourbon Explorer**. The ability to remotely survey the data output from the Kongsberg Maritime solution is a first for the industry and a further step on the road to ever smarter ships.

“DP Digital Survey” is a solution developed by Kongsberg Maritime, in close collaboration with Bourbon and BV DP experts. It is a digital tool running on an industrial data management system that ensures unprecedented data consistency to verify on-board systems. DP Digital Survey acquires the information directly from the ships’ control systems and delivers it to the auditors via a secure cloud infrastructure, thus representing a real improvement in terms of quality of services. The new application stands out from alternatives, providing real data of test completion evidence, not just photographs and video recordings.

The anticipated next steps as the DP Digital Survey tool evolves will include - increased automation of the survey process, improvements in the survey process - and the ability to establish a continuous DP survey framework allowing detailed, and continual, remote monitoring.

The *Bourbon Explorer*



Laurent Leblanc, Vice-President, Marine Operations, BV commenting said, "The key for us is to receive reliable performance and failure data – not just photos and pictures. We first check the data is of sufficient quality - data quality management is a key factor along with cyber-security for data transfer. Our expertise is then used to review and assess the data. This provides access to a higher level and depth of 'onshore' engineering expertise to make judgements on results."

Eivind Alling, Vice-President of Digital Performance at Kongsberg Maritime, added, "This collaboration allows us to strengthen our core products by offering our customers tools that will reduce their OPEX and streamline their operations. Kongsberg strives for innovation and we are creating new applications that will give our end customers more control of their data to support their operations."

Commenting on the project and partnerships, Frederic Moulin, One Bourbon Operations Director, said, "This project greatly contributes to our Smart shipping program ambition; to capitalise on the digital revolution in order to stand out through a connected fleet and to reduce our operational costs. With our partners, we are ready to extend this "Digital DP Survey" to sister-ships in the next months and plan for further deployment later."

Matthieu de Tugny, President, Marine & Offshore, BV concluded, "BV is proud to be a part of these projects bringing increasing sophistication to surveying capability. We have been investing a great deal in digital capability and it is good to see practical results in the field providing real, measurable benefits to our clients – to help improve performance and safety while potentially reducing OPEX."

FEATURE:

ØRBECK-NILSSEN: SAFETY MUST REMAIN AT THE CORE OF SHIP OPERATIONS:

When DNV GL Maritime's CEO, Knut Ørbeck-Nilssen's, issued a warning at a press conference last week that ship safety may have been compromised by the 'tectonic shifts' taking place across the global shipping industry, few people realised just how timely his warning was. Within days, the **Viking Sky**, a large cruise ship owned by Torstein Hagen-controlled Viking Ocean Cruises, had come within a few minutes of a major disaster following the breakdown of most of her engines in a raging storm off the Norwegian coast. A significant number of the 1,300 persons on-board had to be winched to safety by helicopter.

A few thousand miles away and only a few hours later, the 154,999 m³ LNG tanker **Aseem**, in which the Shipping Corporation of India holds a significant stake, was in collision with the 281,400 dwt Navios-Maritime VLCC, **Shinyo Ocean**, at the Fujairah Anchorage during the hours of darkness. At the time of writing, both ships are understood to have sustained significant damage.

The tectonic shifts identified by Ørbeck-Nilssen were:

- Markets – more complex and unpredictable
- Regulatory landscape – large volume of new measures and again, much more complex
- Technology – the arrival of artificial intelligence, remote monitoring, sensor-based data

Shipping, he said, is undergoing a transformation of many of the established procedures which have been in place for decades and he suggested that safety may have been side-lined to some extent by these rapid advances. It was essential, however, that it should remain at the core of marine operations as all of these changes are taking place.

The two most recent incidents have followed a spate of cargo-related fires at sea, notably on container ships. Only last week, the international transport and logistics insurer TT Club revealed that one major container ship fire incident is now occurring at sea on average every 60 days. Four fires have occurred so far this

Knut Ørbeck-Nilssen



year, the most recent being the Grimaldi-owned container ro/ro ship, **Grande America**, which eventually sank on March 12th in the Bay of Biscay whilst on a voyage between Hamburg and Casablanca.

Although mis-declared cargo is not thought to have been the cause of the **Grande America's** demise, the unknown contents of boxes shipped deep under the decks of today's massive container carriers are a constant headache for insurers – both from a hull-and-machinery standpoint, and from a P&I perspective. Many dangerous cargoes are shipped by sea and insurers are only too well aware of the perils relating to spontaneous combustion, oxidation, liquefaction and toxicity, to name but a few.

Ørbeck-Nilssen suggested five steps that would enable shipping to strengthen its safety culture, starting with the development of holistic regulations with safety at the core and the introduction of an industry-wide safety culture. A steady stream of new environmental regulations are being introduced, but Ørbeck-Nilssen suggested that environmental issues were sometimes coming ahead of safety.

He pointed out that the availability of more information could allow the unlocking of data silos to provide deeper insights into incidents and near misses. Barrier management techniques such as those used in the energy and aviation industries should be applied, he suggested. And increasing the transparency of safety findings after maritime accidents was another key step. Immediately, contrasts with the airline industry came to mind, with the findings of major marine casualties including the March 31st, 2017 sinking of the **Stellar Daisy** still not made public, two years after the very large ore carrier sank in the South Atlantic on a voyage from Brazil to China.

The DNV GL Maritime CEO was followed by his colleague Eirik Nyhus, the classification society's director, Environment. He gave a briefing on likely fuel issues in the months ahead which, others have suggested, could themselves generate a new range of safety challenges relating to fuel stability, compatibility, ship-board fuel systems and main engine performance. However, while Nyhus acknowledged that the introduction of new low-sulphur fuel blends will prove challenging, he said the effective management of fuels on-board ship should mean that risks can be safely managed.



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ON WATCH:

Cyprus' **WSR Services** and Senegal's **Dakarnav (Chantiers Navals de Dakar)** have extended their long-term co-operation in Cyprus, to the territory of Russia, signing an exclusive representation with local UMAR|WSR office.

Dakarnav shipyard is a full-service ship repair facility located in the Port of Dakar in Senegal, ideally situated on the West Coast of Africa to service all types of sea-going vessels using the North-South sea route. A fully affiliated company of Lisnave International SA, is one of the largest ship repair companies in the world and the leader in Europe.

The expansion aims towards further growth of UMAR|WSR and Dakarnav by offering quality support and repair service in Dakar to Russian shipowners.

The WSR team with Dakarnav's Jahir Santos (centre)



Leading international maritime law practice **Hill Dickinson** is sailing confidently into the future with a series of important, high-level appointments. Joining Hill Dickinson are Master Mariner Kevin Austin, Korean market specialist Beth Bradley, and transactional lawyer Sung Hwan Choi.

Experienced Master Mariner Kevin Austin, currently a Legal Director with Norton Rose, is especially well known in the London Hull Market. He will join Hill Dickinson as a Legal Director in London, following a strategic rearrangement of the firm's mariner team, which sees Joe Quain return from Singapore as a Consultant in London as Ian MacLean heads out to join the team in Singapore.

Beth Bradley joins Hill Dickinson's London offices from Clyde & Co as a Partner. Well known for her dedicated work on numerous high-profile disputes and litigations, Beth has a wealth of international maritime experience and a specific interest in the Korean market where she is extremely highly regarded.

Sung Hwan Choi (known as SD Choi) joins as a Partner in Hill Dickinson's Singapore office. Currently of Counsel with Norton Rose, SD is a well-known and highly recognised transactional lawyer who is dual qualified in England & Wales, the USA and the Marshall Islands.

At a recent meeting, the Supervisory Board of **Rolls-Royce Power Systems AG** agreed on extending the contracts of President and CEO Andreas Schell alongside CFO and HR Director Marcus A. Wassenberg. Both contracts were extended until December 2022.

"The Board of Directors at Rolls-Royce Power Systems has jointly stabilised business operations significantly over the past years to make this organisation fit for the future. The recently published figures for fiscal 2018 are proof positive of this upturn," said Axel Arendt, Chairman of the Supervisory Board. "In bringing the RRPS 2018 transformational change program to a successful conclusion, management and workforce have laid the cornerstone for the PS 2030 Strategy. Initial successes are already clearly visible. We can now continue steadily on our chartered course under the on-going aligned direction of the Board of Management," he added.

SHIPAAT