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REMONTOWA
SHIPREPAIR YARD

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Finnlines' ro/ro vessel **Finntide** being lengthened in Poland's Remontowa

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Email: shipaat@aol.com, Tel: **+44 (0) 1268 511300**, Contact: **Alan Thorpe** or **Sue Morson**.

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Leading international law firm Ince & Co has advised shipping and transportation companies to prepare for more cyber-attacks in the wake of recent high-profile incidents. Following the widespread impact and disruption caused by the WannaCry and NotPetya attacks earlier this year, a spate of incidents in the recent weeks has highlighted the evolving threat to not only shipping companies, but other parts of the supply chain.

BW Group revealed last month that it was hacked in July, causing its computer systems to go offline. In addition, so-called ethical hackers claimed to identify security flaws in the onboard satcom boxes of satellite communications company KVH, whilst a cyber-security specialist reported on vulnerabilities in Inmarsat's shipboard communications platform. Both KVH and Inmarsat have since responded to these claims.

According to Ince & Co, the root cause of this challenge is that increasing digitalisation, advances in satellite communications, and a drive towards greater technological efficiencies all increase the risks for owners and operators rushing for the benefits, without considering the side effects.

Rory Macfarlane, Partner, Ince & Co Hong Kong, commented, "Throughout 2017, we have seen headline-worthy cyber-attacks occur with growing frequency and severity. A number of high-profile companies have already fallen foul of the risks posed by the increasing digitalisation of our industry. As new technologies emerge to streamline operations, cut costs and increase efficiencies, evolving and expanding cyber-threats also emerge. It is imperative that shipping companies act to mitigate their cyber-risk now, before they become the next victim of a major breach."

Rory Macfarlane points to the WannaCry and NotPetya ransomware attacks as examples of the type of threat facing the shipping industry, "The effects of the NotPetya and WannaCry ransomware attacks proved a potent example of how costly a large scale, sophisticated cyber-attack can be, but for those working within cyber-security, these attacks did not come as a surprise.

"With operations impacted, there was an obvious financial cost to these incidents. But the reputational damage could prove more serious. We have seen hard-earned track records for compliance and operational excellence all but evaporate in the event of a public breach. While the costs of this type of damage are hard to quantify, it adds yet another reason to invest in appropriate cyber-security systems and employee education."

Rory Macfarlane also highlights the difference between 'cyber-attack' and 'cyber-breach', "Businesses must recognise a simple fact - there will be - or has already been - a cyber-attack on your business. But a cyber-attack being inevitable does not mean a 'company-ending' cyber-breach will be. Companies that make honest assessments of their businesses and get on the front foot will be able to mitigate their cyber-risk dramatically. Those who decide to 'wait and see' will have a rude awakening as these kinds of risks continue to develop.

"What we see now is the tip of the iceberg. The size of the threat is underplayed due to a reluctance within the industry for victims of a breach to share their experiences for the collective good. Moreover, as it is common for cyber-criminals to remain in a company's system for up to six months after an initial breach, waiting for the most appropriate moment to strike, there will be businesses that are about to suffer a loss and do not realise it.

"To be sure in the security of their systems, companies must begin to develop comprehensive security and response plans as soon as they can. The response plans should outline the steps to take in the minutes, hours, days and weeks after a breach. We also recommend that companies engage with a multi-disciplinary team that is ready to step into action, including IT teams, compliance experts, fleet managers and shoreside staff."

"In the world of cyber-prevention, by far the best form of defence against cyber-crime lies in a concerted, top-down effort to planning and prevention. Indeed, board members should be aware that an unprevented cyber-breach could constitute an abdication of fiduciary duty, if mitigating measures were ignored or not put in place.

"Ince & Co is working with the leading cyber-security team at Navigant to offer a cyber 'health-check'. In this health-check, we work with companies to create a written assessment of IT policies and procedures, employee protocols, regulatory and contractual obligations, insurance cover against losses following a cyber-attack, and evaluate cyber-response plans. This is not a 'one-size-fits-all process' - a bespoke approach is needed for each company as they continue to digitalise their operations.

"The message is simple: improving your cyber protection need not be costly. Significant improve-

ments can be made for a modest investment. But prevention is always better than a cure, and the creation of a culture of cyber-security is essential.

“Shipping is on the cusp of dramatic evolutions in how business is conducted, goods are moved and deals are sealed. But as we embrace all of the benefits new technology has to offer, it is only right that we also examine the risks, lest we fall foul of them ourselves.

“It may be time for the focus of the debate to shift from cyber-security to cyber-preparedness. As the amount and sophistication of attacks increase, and the digital and human attack surface expands, the chances of permanently keeping threat actors out of our businesses is diminishing month on month.

Even a cursory glance at the list of blue-chip businesses, both within and outside shipping, who have suffered huge losses from significant cyber-events should dispel the myth that seems to remain in the boardroom that “this could not happen to us”. Implementing measures that will minimise the harm that can be done once your systems are hacked is crucial.”



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SHIPYARDS:

REMONTOWA:

The first of four Breeze-class ro/ros owned by Finnlines, the 28,002 gt 2012-built **Finntide**, arrived at the Remontowa Shipyard, Gdansk, Poland on September 26th to start her 30 m lengthening project (See Front Cover). The lengthening will increase this vessel freight capacity by nearly 1,000 lane m (30%). The three remaining sisterships, **Finnwave**, **Finnsky** and **Finnstar**, will be worked on up until May 2018. The Polish yard also holds options on jumboising two other vessels of this class.

VIKTOR LENAC:

This year (2017) will be a good year at Croatia's Viktor Lenac, Rijeka. All drydocking capacities were fully employed during the first three quarters and it continues in the fourth quarter. A total of 48 projects have been completed in the third quarter including the modernisation of **USS Mount Whitney (LCC 20)**.

Extensive shiprepair and upgrading works were carried out on-board this US Navy 6th Fleet Flagship from December 2016 to October 2017. The project resulted in high utilisation of the workforce and brought a stable cash flow. All work was finished with high quality and on-time with no safety incidents. In addition, voyage repairs were carried out on **USNS Trenton** (T-EPF 5) in October, and for the first time in history, the yard accommodated two US Navy vessels at the same time.

Another major project was the conversion of the fishing factory stern trawler **Navigator**, owned by Iceland's UTS Management. The vessel has been lengthened by 25 m and work included removal of the existing azimuth propeller and fish meal unit dryer, cutting and removal of bulkheads (approximately 35 tonnes), fitting insulation in different compartments and new bulkheads (700 m²), installation of 28 freezers in the processing area, new piping and electrical systems installation, and relocation of equipment such as aft deck crane and net drums.

BWT systems installation projects continued in 2017 following three successful projects in 2016, for SCF Group. This year saw Viktor Lenac complete work on 47,095 dwt **SCF Amur** and the 47,218 dwt **SCF Pechora**. Earlier this year, another SCF Group's 122,039 dwt tanker **Nikolay Zuyev** had undergone extensive maintenance and repair works.

A BWT system co-operation agreement was signed in June with Wärtsilä. "It is a great recognition to be chosen as a desirable partner by a company as Wärtsilä. That speaks for itself about Viktor Lenac's position in today's shiprepair industry on a global level." - said Aljoša Pavelin, President of the Management Board & CEO of Viktor Lenac. The BWTS market is still warming up and a real boost is expected in the period 2019-2021. This will mean a great deal of pressure coming from shipowners both on BWT system manufacturers and shipyards that will execute BWTS installation.

The fourth quarter began with a new client – Kuwait Oil Tanker Co, and involving its 113,849 dwt tanker **Wafrah**. Extensive work including hull and deck anti-corrosion and coating works, stern tube seal inspection, propeller anti-corrosion and coating, shipside and other valves inspection, LSA equipment inspection and testing, pressure testing of all deck lines, ER tanks cleaning, significant work on main deck equipment, electric motors, ER/PR machinery (ME, pumps, coolers, heaters).

Germany's FTI 9,570 gt cruiseship **Berlin** was again at the yard, carrying out repair work on a cruiseship characterised with narrow, fully arranged spaces, offering limited access, and a big crew, implies extraordinary protection measures.

The newest robotic Ultra High Pressure Water (UHPW) Jet technology was introduced in the second quarter. UHPW is expected to gradually replace traditional sandblasting in the yard and significantly speed up operations, cut costs and better protect the environment. The Spiderjet robot does not produce any dust and is exceptionally silent - produces noise below 60 decibels, so it can be used 24/7. Used water together with impurities is drained into the tanks in which it is filtered for reuse, while the particles of paint and rust are removed into a separate container. The Spiderjet can clean 400 m² of ship surface in eight hrs. In addition to accelerating business processes, reducing work hours and consequently increasing competitiveness, the newest energy-efficient UHPW technology is expected to reduce energy consumption by some 60%.

In figures, the total expected revenue is €65m. Due to much better cost control, achieved through increased process efficiency and workforce productivity, Viktor Lenac expects a healthy net profit margin. Put in the perspective, major revenues were generated on the US, Italian and Russian markets, followed by Iceland, Denmark, Norway and Kuwait. Most of Viktor Lenac's shiprepair clients are from Germany, Italy, Greece, Cyprus, UK and Norway.

The Viktor Lenac Shipyard, Croatia



LISNAVE:

During the first nine months of this year Portugal's Lisnave, Setubal repaired 62 vessels, mainly originating from regular customers. This is a constant trend in Lisnave over many years, becoming the brand image of Lisnave and the expression of the world-wide recognition by shipowners of the quality of work developed by Lisnave. In the same period in 2016, the number of repaired vessels was 54 units.

The total number of repaired vessels in 2017, originated from 39 different clients from 19 countries. Highlighting the countries that generate more business, Singapore owners/managers sent a total of 11 vessels for general repairs, Greece with seven, Denmark and Germany with six each, Belgium and Brazil with five vessels each, Venezuela with four, and Norway and Hong Kong with three vessels each.

Lisnave continues to repair various types of vessels, supported by the hefty know-how accumulated over decades. The traditional tanker market represents the largest number of vessels docked (34), followed by containerships with 13 vessels and bulk carriers with eight vessels.

During this period the regular customers with the largest number of vessels repaired Lisnave's Mitrena Shipyard were A.P. Moller/Maersk with six vessels, V. Ships (Brazil, Germany and Singapore) and Teekay Marine (Norway and Singapore) each with four vessels.

The main graving dock at Lisnave

**NEW HELLENIC SHIPYARDS:**

Canadian west coast ferry operator BC Ferries latest fleet addition, **Northern Sea Wolf**, set sail from Greece on November 3rd following a drydocking and repainting in BC Ferries colours at Greece's New Hellenic Shipyards, based on the island of Salamis, near Piraeus. The epic 10,097 nautical miles voyage to British Columbia is expected to take around 35 days to complete, via the Panama Canal.

On arrival she will undergo a major mid-life upgrade project at a yet to be named Canadian shipyard to ready the vessel for her new service between Port Hardy and Bella Coola from the summer of 2018.

A decision on which shipyard will carry out the mid-life upgrade of **Northern Sea Wolf** will be made by the end of 2017 with work including the upgrading of various shipboard systems, crew living and working spaces and a complete passenger accommodation and food services modernisation. Following the upgrade the 2,679 gt 2000-built vessel will be able to carry 150 passengers and crew and 35 vehicles. Northern Sea Wolf was acquired from Greek owners and taken over at the end of August having sailed in Greek waters as the **Aqua Spirit**.

FOSEN YARDS:

The first of two large cruise ferries owned by Norway's Fjord Line, the 31,678 gt 2013 built **Stavangerfjord**, arrived at Norway's Fosen Yards in Rissa on October 30th for installation of a new forward accommodation block. The new block features 60 new passenger cabins and a 125 seat extension to the vessel's existing Buffet Restaurant. The ferry will be in the shipyard from November through to December and will be followed by sistership **Bergensfjord** during January-February 2018 for the same work. Both vessels were built by Fosen.

BLOHM + VOSS:

The first of two P&O Cruises' vessels arrived at Hamburg's Blohm + Voss Shipyard (B+V) on November 1st for her scheduled refit. The 84,342 gt 2005-built **Arcadia** entered the yard's 320,000 dwt capacity graving dock Elbedock 17 for a multi-million pound sterling two week upgrade with work centring around passenger cabins and suites, public areas and main dining restaurants.

P&O Cruises is partnering with London-based RPW Design Ltd on this project, one of the world's leading hospitality interior design practices. Fleet mate **Oceana** will drydock at B+V at the end of November. Work on this 77,349 gt 2000-built vessel is scheduled for completion on December 16th. Work on this vessel includes an upgrade and refresh throughout to appeal to passengers undertaking both summer and winter cruises.

Meanwhile, B+V has just completed the drydocking and repainting of the former German-owned fast passenger ferry **Hauldander** Jet for her new US owners – Seattle-based Clipper Navigation. The fast ferry was loaded aboard the heavy lift vessel **Palobora** in the port of Emden for the voyage to the US West Coast. On arrival the 2003-built 579 passenger capacity ferry will be renamed **Clipper V** and operate between Seattle and Victoria, British Columbia.

CHANTIERI NAVAL DE MARSEILLE:

Following the re-entering into service of the large graving dock Dock 10 in Marseille, cruiseship business for local repairer Chantier Naval de Marseille (CNdM) has been gaining momentum. With MSC Cruises **MSC Orchestra** currently sitting in Dock 10 undergoing a major exhaust gas scrubber retrofit, fleet mate **MSC Magnifica** arrived alongside this dock's outfitting quay on November 5th. Meanwhile, undergoing repair in CNdM's Docks 8 and 9 the week beginning November 5th were the 1,189 gt 1991-built sail cruise vessel **Le Ponant**, owned by France's Ponant Cruises and AIDA Cruises 71,304 gt 2000-built **AIDAblu**.



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MAN/GDD:

During last week's Europort 2017 exhibition in Rotterdam, Germany's Wessels Reederei signed a letter of intent with MAN Diesel & Turbo for the conversion of three of its fleet to dual-fuel gas operation. Bremerhaven's German Dry Docks (GDD) will carry out the conversion work.

Gerd Wessels, managing partner of the shipping company, commented, "We would like to continue this successful co-operation. With the pilot project of retrofitting the **Wes Amelie**, we have proven that a shift to environmentally friendly LNG is possible. This is a right step in the right direction."

"The order intake of more retrofitting jobs is now a consequent step. With the experiences

from the pilot project, GDD will be able to process them significantly more efficient and thus offer them more competitively," added Guido Försterling, CEO of the GDD.

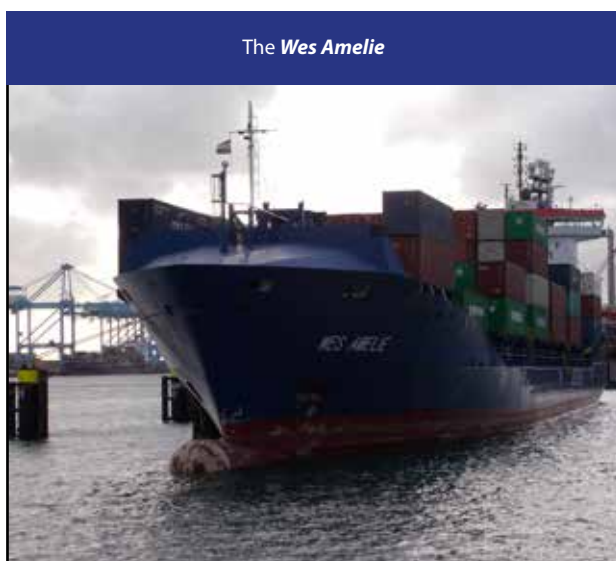
The three sisterships follow the **Wes Amelie**, a 1,036-teu feeder container ship with an MAN 8L48/60B main engine that was retrofitted in GDD to a multi-fuel, four-stroke MAN 51/60DF unit earlier in 2017. The retrofit enables dual-fuel operation and is the first such conversion of its type the world has ever seen.

Stefan Eefting – Senior Vice President, MAN Diesel & Turbo and Head of MAN PrimeServ Diesel in Augsburg – said, "The **Wes Amelie** project was really a pioneering moment in the European container-feeder market and shows clearly that existing MAN engines can be converted to LNG operation with a tremendous effect on exhaust emissions and the environment."

MAN Diesel & Turbo reports that the dual-fuel conversion has enabled the **Wes Amelie** to significantly reduce its SOx emissions by 99%, NOx by approximately 90%, and CO₂ by up to 20%. The vessel now meets both the Tier II and Tier III emission requirements set by IMO.

Eefting praised Wessels' co-operative spirit and concluded, "One of the key reasons the **Wes Amelie** was selected for conversion was its 'multiplier effect', that is, its many sister ships that would facilitate follow-up projects at reduced costs owing to the experiences gained from the first project. I believe the signing of this letter of intent validates our approach and points a realistic way towards decarbonisation and a climate-neutral shipping industry by 2050."

When selecting a suitable vessel for conversion, special attention is paid to the scalability of the engineering services as well as the development costs, reducing significantly the costs for follow-up projects. In this respect, the **Wes Amelie** has 23 sisterships, 16 of them structurally identical, which would allow follow-up projects to be easily implemented, facilitating a multiplier effect.



The **Wes Amelie**

The term 'Maritime Energy Transition' stems from the German expression 'Energiewende' and encapsulates MAN Diesel & Turbo's call to action to reduce emissions and establish natural gas as the fuel of choice in global shipping. It promotes a global 'turn to gas', driven by IMO and a common approach by the shipping industry and politics to invest in infrastructure development and retrofits.

Launched in 2016 after COP 21, the initiative has since found broad support within the shipping industry and German politics. Stemming from the success of the **Wes Amelie** project, and to encourage more shipowners to follow its example, MAN Diesel & Turbo pledged a total discount of €2m for 10 such LNG-retrofits.

Gerd Wessels (left) and Guido Försterling signing the LoI at Europort



MAN DIESEL:

TOTE Maritime Alaska, a daughter company of TOTE Inc recently contracted MAN PrimeServ – MAN Diesel & Turbo's after-sales division – to convert the **North Star** and **Midnight Sun** to dual-fuel operation on LNG. The ro/ro vessels are currently both powered by 4 × MAN 58/64 engines and will be retrofitted to MAN 58/64 retrofit units.

A key influence in TOTE's decision to retrofit the vessels to LNG is to significantly reduce the most harmful emissions that result from burning diesel. "TOTE Maritime Alaska is excited to convert its fleet to LNG power which will result in a significant reduction in air emissions including particulate matter, SOx and NOx. This significant investment of time and money is a reflection of our commitment to the environment, our customers and the state of Alaska" noted Michael Noone, President of TOTE Maritime Alaska.

Dr. Thomas Spindler, Head of Upgrades & Retrofits at MAN PrimeServ Augsburg, explained, "To meet TOTE's requirements we have developed a solution based on our well-proven 51/60DF retrofit system. Accordingly, the engineering approach to the 58/64 retrofit is very familiar to us, and this project represents a straightforward conversion procedure.

"The investment will be of huge benefit to the customer on several fronts, not only will the retrofitted engines meet all new emission standards; the new components they receive during conversion will significantly extend their working life."

"We have been investigating and testing many options for shifting the fleet to LNG. The conversion of the existing engines is the most reliable and beneficial solution" said Peter Keller, Executive Vice President of TOTE. "This innovative solution, that has been developed in partnership with MAN, will be an important milestone for the industry as we all prepare for the IMO sulphur cap in 2020."

Pictured at MAN Diesel & Turbo's Headquarter in Augsburg (from left) - Stefan Eefting - Senior Vice President and Head of MAN PrimeServ Augsburg; Peter Keller - Executive Vice President of TOTE; Per Rud - Senior Vice President and Head of After Sales - Marine & Power Plants



ROLLS-ROYCE MARINE:

Rolls-Royce Marine (RRM) has signed a Memorandum of Understanding (MoU) with United Arab Emirates (UAE) based Abu Dhabi Ship Building (ADSB) to provide naval shipbuilding, repair and refit activities across the Gulf region.

The MoU is for a definitive agreement for the provision of services, with the objective of becoming a preferred service partner to each other. The agreement will include fixed service rates for onsite service attendance and turnkey repair projects in the RRM's Dubai workshop. It will also include the provision of spares, technical and commercial support for large tenders and maintenance training of ADSB personnel for RRM waterjets.

Leo Pantazopoulos, RRM, Senior Vice President Asia & Middle East – Marine said, "By working with ADSB, located in the heart of the Gulf, we are strengthening our ability to provide regional Governmental and Commercial customers with access to skilled engineers and state-of-the-art facilities, allowing them to repair and overhaul their ships efficiently and with minimum downtime."

"The agreement creates a strong foundation for a meaningful partnership between our two companies. It establishes a growth platform that will enable us to best serve our customers in the region."

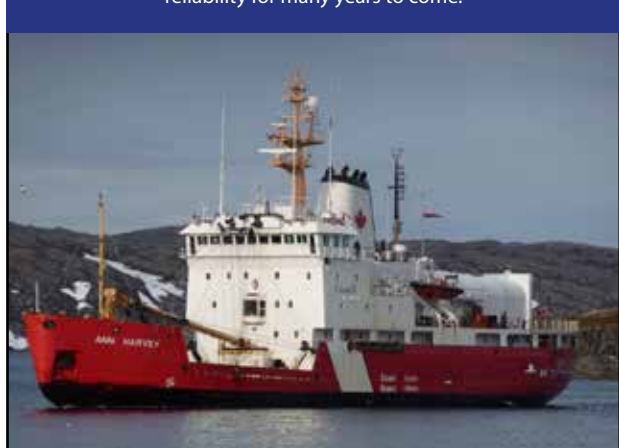
The contract extends an existing relationship between RRM, ADSB and the UAE Navy for both new builds and retrofits, and has the potential to lead to the development of advanced technological products such as Equipment Health Monitoring and remote and autonomous vessels.

In the past year, RRM has secured a number of waterjets spares, services and upgrade orders. This MoU will pave the way for more opportunities, in particular retrofit projects.

WÄRTSILÄ:

Finland's Wärtsilä will support the 1100 Class High Endurance Multitask Vessels operated by the Canadian Coast Guard (CCG), to renew their current propulsion generators. These vessels serve for buoy tending, search and rescue and icebreaking in each of the three Region of the CCG. The new, more modern propulsion generators will contribute to the vessel's reliability for many years to come. Furthermore, the standards of engineering and fuel consumption for the new engines will lead to reduced operational costs and lower emissions.

Wärtsilä and Public Services and Procurement Canada signed the agreement for the replacement of the diesel engines and the integration engineering on-board in July 2017. The contract covers one vessel but also allows for the five additional 1100 Class vessels and for an engine for the CCG's College in Sydney, NS to be used for training of future CCG engineers and technicians.



Operating in arctic weather conditions, the CCG requires equipment that meets the highly demanding operations of an icebreaker vessel. For these vessels, built from 1985 to 1987, reliability is an essential element for the remaining lifecycle. Wärtsilä won the public bid by offering the lowest total cost of ownership in 15 years of operation combined with a strong service presence and long-term availability of parts.

Operating 114 vessels and 23 helicopters, the CCG is responsible for programs and services that contribute to the safety, security, and accessibility of Canada's waterways such as marine search and rescue, aids to navigation, ice-breaking, marine pollution response and providing support for other initiatives of the Canadian government.

The Wärtsilä engines will be capable of doing a load step of 43%, as required by an icebreaker, and operate in cold air conditions at full load where the air temperature can fall as low as -30° Celsius and rise as high as +45° Celsius.

"This order is highly significant for both the CCG and Wärtsilä. We will ensure reliable operations for CCG for many years to come," says Rumi Mistry, Managing Director, Wärtsilä, Canada. "Wärtsilä has had a long-term relationship with the Canadian Coast Guard, and we are happy that this partnership will continue long into the future as well."

The signing agreement in ADSB



ENIRAM:

Eniram, a Wärtsilä company, has signed a five-year service agreement with Corsica Linea to take them to the forefront of digitalisation and performance management. The agreement covers the fleet owned and operated by Corsica Linea between Marseilles and Corsica. These five vessels will be upgraded to the latest

Eniram real-time performance management standards.

With Eniram's solutions, Corsica Linea is able to reduce fuel costs and optimise its operations. In addition, Eniram's solutions take into account upcoming regulations concerning the monitoring, reporting and verification of carbon dioxide emissions from maritime transport (EU MRV). The agreement also includes MRV reporting and analytics services. (The upcoming EU MRV regulation requires ship owners and operators to annually monitor, report and verify CO₂ emissions.)

"We are extremely happy to see Corsica Linea take this step and to start collaboration with us towards future performance management," says Johan Backas, Managing Director at Eniram.

"Thanks to this agreement, Corsica Linea will get more analytics, insight and recommendations, guiding their future operations management," says Nicolas Rossi, Senior Account Manager at Wärtsilä.

Corsica Linea is the new brand name of Maritima Ferries, who acquired SNCM ships in 2016. Corsica Linea's five ferries provide year-round services from Marseille, the main trading port in France to the French Mediterranean island of Corsica.

Improved monitoring of on-board and onshore fuel tank inventories, is provided for vessel owners and bunker operators with a new module from Royston Diesel Power.

ROYSTON:

The latest enhancement to Royston's advanced engine fuel monitoring system, the tank monitoring module features EFMS (Electronic Fuel Monitoring System) technology to provide real-time inventory measurement capabilities. enginei accurately records data by monitoring bunker deliveries and individual engine consumption, with the data presented on touch screen monitors installed on the bridge and in engine control rooms. In addition, the system transmits the information from ship to shore, where it can be accessed through a web dashboard with computer generated graphs and Google mapping to show an operational profile of a vessel.

Incorporating modern sensor technology, volumetric readings are calculated by the module after measuring variables in temperature and pressure to produce accurate fuel readings. The information is displayed locally but can be rapidly transmitted to the enginei web portal as part of a comprehensive monitoring and control system package.

Royston's enginei provides comprehensive fuel data analysis and reporting options to provide vessel owners and operators with a detailed picture of engine performance and other mission critical information. This 'complete accountability' capability improves asset visibility and control, decision making processes at all levels, and helps to resolve any shortfalls encountered both onboard a vessel and at an onshore facility, ensuring fuel security.

Alongside fuel consumption, the enginei system also provides a low-cost method of measuring vessel emissions, including CO₂, NOx and SOx, for monitoring and assessment against IMO, SECA zone and SEEMP regulations.

In addition, to help operators on inland waterways calculate tax payments to relevant authorities, enginei also includes a Geofencing capability. This feature enables accurate fuel consumption measurements to be linked to voyage and GPS data to enable fuel tax liabilities in different waterway tax zones to be calculated, recorded and reported quickly and efficiently.

The enginei integrated fuel management system is compatible with all marine engine types and can be interfaced with new-build engine installations or retrofitted to operating vessels.

REMOY SHIPPING:

OSV specialist, Remoy Shipping, is currently working on a project given to it by Norway's major oil company Statoil, to have its ships, the majority on charter to Statoil, smarter and greener operations. This project was originated by the Norwegian Government department NOVA and was then fed down to the charterers of OSVs and PSVs to reduce fuel consumption and therefore reduce emissions. It is common that the charterer pays for the fuel and therefore it is in everyone's interest to comply with the aims of this project.

Remoy Shipping looked into exactly how much Big Data was being collected from all the monitoring systems on-board their fleet, and then what to do with this data. Remoy enlisted the help of Recogni, a local Norwegian company dealing with Big Data analytics. Recogni entered its 'Refuel' programme to Remoy's fleet – looking closely at the various operations in which each individual ship finds itself. It was found that in an average ship operation, 30% of its time is spent in transit, 30% in on-field activities, virtually all d.p., and the rest in port. Obviously the power requirements for each operation is vastly different.

The ship used for this project was the 4,157 gt OSV REM Hirst which is powered by four Caterpillar diesel generators – two larger and two smaller units, and a total of five Schottel thrusters. No new sensors were put on-board the ship – it was simply how the data collected was utilised. Live data allows Remoy to monitor all the necessary operations of all the generators and thrusters and recommend to the ship's officers how fuel savings can be achieved. This has been calculated as up to 20%.

ROLLS-ROYCE MARINE:

Since the days of Ulstein, Vickers and Kvaerner, Rolls-Royce Marine (RRM) has been well-established in the Aalesund Cluster area. One of the other companies taken over by RRM was Peilo Teknikk, located on the island of Longva. This very picturesque facility is now RRM's main automation development and production centre.

The two main projects currently underway at this facility are the new Hurtigruten expedition ships building at Kleven Shipyard on Ulsteinvik, and the research vessel **Sir David Attenborough**, building in the UK at Cammell Laird, Birkenhead. All of these highly sophisticated ships are being built to RRM design and include a great deal of RRM equipment including the automation systems.

These include ICON D.P., which is integrated into the bridge, ACON (Automated Control) for such operations as tank gauging, PMS (Power Management Systems), condition monitoring steering gear control, winch controls etc – all this equipment manufactured by RRM subsidiaries.

Service activities are also carried out from the Longva facility, some 22 ships currently being monitored from this facility's Data Analytical Centres on Longva and from Aalesund.

This facility has also been working with the Norwegian Coast Guard and Island Offshore on battery power – the Hurtigruten vessels with also have batteries on-board. The Longva facility is also involved in RRM's Marine 4.0 (Future Vision) for autonomous ships. This is already a reality with a small ferry on Norway's island trade, with RRM looking at much larger possibilities with containerships, large ferries etc. on world-wide trade.

RRM's facility on the Norwegian island of Longva



MAN DIESEL:

MAN Diesel & Turbo's MAN L51/60DF engine successfully passed its Type Approval Test (TAT), which ran from October 17th to 20th at the company's Augsburg works in Germany, in front of the industry's main classification societies. The nine-cylinder test engine has an output of 1,150 kW/cylinder at a nominal speed of 500/514 rev/min.

The MAN L51/60DF engine can be employed both as marine main-engine and auxiliary engine. Augsburg's testbed No. 20 hosted the test programme of a nine-cylinder version of the engine that ran on fuel oil (DMA) and natural gas.

The TAT tested the engine's:

- alarm and safety system
- dual-fuel safety concept, including a test of its pilot-fuel system
- gas supply system.

The TAT also successfully tested the integration of MAN Diesel & Turbo's proprietary SaCoSone engine control system with the engine.

Lex Nijssen, Head of Four-Stroke Marine, MAN Diesel & Turbo said, "The MAN L51/60DF, with its improved rated-output and new features such as gas-start capability, is a welcome addition to the ranks with the flexibility to act in a main or auxiliary capacity. Whether operating on fuel oil or gas, I'm certain its efficiency and high power output will be appreciated by the market."

MAN's Lex Nijssen

**CATERPILLAR MARINE:**

Caterpillar Marine has introduced the new Multi-Engine Optimiser (MEO) tool, which leverages proprietary performance data and patented control algorithms to provide intelligence for power management systems. MEO works by advising power management systems on which engines to operate and enables the use of dynamic asymmetric loads to drive the combination of engines and loads to create the lowest possible fuel consumption.

"MEO is designed to operate in conjunction with any system, new or retrofit," said Theodore Wiersema, business process manager for Caterpillar Marine. "The PLC-based system contains proprietary performance data and control algorithms providing the highest overall fuel efficiency. MEO enables a stable bus while engines of different size and rated speeds simultaneously share load operating at different targeted fuel set points. The cost savings can be quite significant depending on the load profile of vessel and the types of engines on the bus," said Wiersema.

The 700 mm wide MEO cabinet can be installed in an engine or control room and requires less than six wire connections. "MEO is viewed by marine societies as an advisory system and will have type approval certification. As an advisory system MEO can be turned off at any time allowing the existing power management device to return to its normal operating procedures to provide an extra layer of protection and safety," said Wiersema.

By mixing and matching engines and independent load

Caterpillar Marine's new Multi-Engine Optimiser (MEO) tool



points, MEO allows engines to provide power at their most efficient point. Compared to the common scenario of engines operating at an equally shared load the MEO system creates an unlimited combination of virtual engine rooms to match each particular vessel load.

MEO will be available for purchase November 15th and backed by the worldwide Cat dealer network with trained technicians to ensure service support is never out of reach.



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EMISSIONS:

ROLLS-ROYCE MARINE:

Rolls-Royce Marine (RRM) has extended its marine Energy Management solutions with a 'cloud-based' fuel consumption and carbon dioxide monitoring module designed to help shipowners meet the EU's MRV regulation.

The collection and reporting of voyage data will become a mandatory requirement from January 1st 2018, when owners of vessels over 5,000 gt that call at EU ports will have to monitor, report and verify their fuel consumption and CO₂ emissions.

Bjørn Kåre Myskja, RRM, UX/Developer Engineer, Digital& Systems, said, "The Energy Management EU-MRV module allows for automated gathering and reporting of fuel consumption, CO₂ emissions and other relevant data required of the new regulation."

With the new module installed as an add-on solution to the Rolls-Royce Energy Management System launched in May, data can be sent automatically from the ship to the 'cloud', where information and reports can be accessed and downloaded from anywhere with an internet connection. The software also validates incoming data.

"With shipowners able to constantly track accurate fuel consumption and emissions data via the Rolls-Royce Energy Management web portal, they can reduce fuel costs and mitigate against non-compliance and any financial penalties imposed by member states. More accurate data delivers greater costs savings," Myskja said.

In addition to data collection simplicity, a key focus during the software development phase was data protection.

Eivind Vinje, RRM, Technical Product Manager – Energy Management, added, "System security and integrity has been increased four-fold, with state-of-the-art encryption technologies, a two-step verification process and a 24/7 security centre. We also invited a number of third party cyber security experts to 'hack' into the sys-

The new RRM 'cloud-based' fuel consumption and carbon dioxide monitoring module



tem, but all failed to breach the protocols or find any weak spots.”

While the Energy Management EU-MRV Module is an invaluable tool for those with operations in the European Union, the system is future-proofed to meet anticipated global requirements. China has similar reporting mechanisms in place, with IMO’s data collection requirements entering into force in January 2019. This requires the collection of fuel consumption data/fuel type, but not CO₂ emissions directly.

The software has been verified by the Norway-accredited MRV verifier Ecoxy AS, which also co-operated in the development of the solution to ensure its compliance with all aspects of the EU MRV regulation as well as to meet customer requirements for a solution capable of substantially reducing manual data inputs.

Since its market introduction earlier this year, the Rolls-Royce Energy Management System has received its first commercial success with a contract for two Nor Lines vessels

BALLAST WATER TREATMENT:

TRAFI:

The Finnish Transport Safety Agency (Trafí) has published a review of methods available for analysing treated ballast water, concluding that Adenosine Triphosphate (ATP) or Pulse Amplitude-Modulation (PAM) technologies should be used to detect the effect of BWT in “a simple, quick, portable and relatively cheap manner”.

Although the study focused primarily on the water conditions and characteristics of the Baltic Sea, it evaluated the efficiency of various test kits to assess their reliability in waters of low salinity and temperature and high turbidity. The objective was to compare the advantages and disadvantages of various methods and to provide recommendations as to the most suitable systems available.

Researchers found that the use of these methods – both indicative methods that provide a direct measurement of a representative sample from the ballast water tank – increased the reliability of ballast water sampling where different types and sizes of organisms were detected.

However, while both methods were considered reliable indicative monitoring tools, the Trafí study found that ATP technologies had the “essential benefit” of being able to measure and detect all organism categories (bacteria, >10 to <50µm and > 50 µm) listed in regulation D2 of the BWM Convention. PAM measurements were found “somewhat limited” to detecting only the presence of phytoplankton.

“The benefit of ATP method over PAM fluorometry is the ability to evaluate the concentration of all organism size categories including autotrophic and heterotrophic organisms,” cited the report.

Carine Magdo, Business Development Manager at aqua-tools, a supplier of advanced second-generation ATP-type ballast water monitoring systems, said, “The research verifies the reliability of indicative ballast water sampling methods in determining whether a vessel is compliant with the discharge requirements of the BWM. It also found that test results are not affected by turbid water, which is especially important to vessels operating ballast water treatment systems in the Baltic.”

The Trafí study, titled Literature Review of the Indicative Ballast Water Analysis Methods, also provided important recommendations on how best to prevent the over- and under-estimation of organism concentrations during sampling; a problem that can result in an incorrect evaluation of BWT systems efficiency.

“This can be achieved simply by ensuring samples are not taken within the first and last five minutes of deballasting operations,” Magdo explained. “Trafí recommends that the usual 10-minute sampling time be revised to take 0.5l samples every minute. At least two random samples in a 10-minute period should be taken, rather than a single 10-minute sequential sample as this can under- or overestimate the concentration of organisms present.”

Other than reliability and performance efficiency, user-friendliness, training, and procurements costs were also assessed in the study, with Trafí suggesting “indicative analysis sampling devices should cost less than \$100,000, with a maximum analysis time of two hrs.”

Aqua-tools ATP-based monitoring kit was costs below \$5000 and less than \$100/sample analysis for the three factions. The price range for those PAM sampling devices assessed, however, varied between \$4,000 and \$15,000.

FUELS:

SHELL MARINE:

Shell Marine has officially launched Shell Alexia 140, a two-stroke engine cylinder oil whose exceptionally high base number aims to deliver the ultimate protection for the most modern efficient engines against cold corrosion issues and the means of optimising oil feed rates when fuel grades change.

The launch follows receipt of a No Objection Letter (NOL) for commercial use of Shell Alexia 140 from MAN Diesel & Turbo and coincides with Shell Alexia 140's acceptance into full scale operations by two major customers. Shell Alexia 140 is now available from the ports of Rotterdam, Bremerhaven, Hamburg, Antwerp, Tanjung Pelepas, Busan and Salalah.

Shell Alexia 140's wider potential was acknowledged in September 2016, when Shell Marine disclosed its selection as the first test oil for 'ACOM' - MAN Diesel & Turbo's Automated Cylinder Oil Mixing process. Shell Alexia 140 joins Alexia S3 (BN25), Alexia S4 (BN 60), Alexia 50 (BN 70) and Alexia S6 (BN100), in a range covering fuel types from LNG to HSFO, operating regimes from full load to slow steaming, and engines of all ages.

"After 18 months of exhaustive laboratory testing and field trials, we are delighted to introduce Shell Alexia 140 formally to market," says Jan Toschka, Shell Marine Executive Director. "Its combined characteristics make it the right choice whether the owner wants to protect ultra-efficient engines against cold corrosion or optimise feed rates across vessel operating conditions."

"We welcome the always pioneering character of Shell Marine that resulted in this latest addition to its comprehensive range of two stroke engine cylinder oils," says Panos Deligiannis Tankers, Neda Maritime Agency Technical Director. "Protecting our engines is critical, and matching the right cylinder oil with vessel operating profile and engine specific requirements is a crucial parameter for ship/engine worthiness and efficient maintenance, whatever the fuel grade being burned."

Toschka emphasises that, considering the greater need to match cylinder oil with operating environment, Shell Marine works continuously to enhance its supporting technical services. Shell Lube Monitor is a cylinder condition monitoring program with newly introduced Marine Connect software used to enhance, simplify and accelerate data management and reporting. Using operational data allows Shell's technical experts to pinpoint the correct balance between the lowest possible feed rate and wear rate in line with OEM recommendations.

In addition to Shell Lube Monitor, Shell Marine offers a vast range of technical services programmes that help to provide the means of understanding the root causes of high wear problems, which also make a critical contribution to enhancing knowledge and skill levels among ships' crews, Toschka adds.

Shell engineers discuss Shell Alexia 140



MAKTEC MARINE:

Yorkshire's Maktec Marine has signed a new world-wide distributor deal with West Midlands headquartered lubricant giant Exol to catapult the brand into the maritime industry.

Maktec owner Mark Cornforth said he is very excited by the deal which will join Maktec's 20 years of maritime industry experience, with Exol's established background of working across sectors as the UK's largest independent lubricants company.

"Exol is a sleeping giant in the maritime sector," he said. "Exol is flourishing in the industrial, automotive, agriculture and transport sectors but wants to ramp up activity in the shipping industry, which is Maktec's specialist area. Exol is a premium engineered British product, known and respected for its excellence. However, by joining forces with Maktec we can strengthen its maritime profile as well as support the product with our deep knowledge of ship and power station diesel engines. A key selling point of this new partnership will be pairing Maktec's know-how with Exol's product expertise. Maktec has a global network of OEM trained engineers as well as agents in India, Cyprus, Singapore and Iraq. That means we can offer on the ground engineering expertise to ship owners at ports worldwide to ensure their engines and oils are being properly looked after."

Mr Cornforth said the prime target for the new partnership will be ship owners and managers of older vessels and large fleets drawing on Maktec's experience working for MaK, MAN, Sulzer, Wartsila and Yanmar worldwide.

"We want to work on older ships where the Exol technology is easy to adapt to and follow whereas newer engines require more OEM factory support," he said. "In our experience it is older engines that are most at risk of failures from oil starvation, fuel dilution and incorrect filtration. These problems can lead to massively disruptive and expensive vessel downtime and even groundings. Working with Maktec and Exol we can help ensure engines are being properly monitored to ensure operators remain on schedule and are meeting their legal requirements. Lubricants are a prime consideration on any ship which is why classification societies are big supporters of fluid checks and oil analysis. Insurance companies also like to see ships are following proper lubricant maintenance and inspection procedures."

Mr Cornforth said Maktec will be promoting Exol's innovative online 'Fluid Check' system launched last year. He said 'Fluid Check' is rated as one of the world's best fluid analysis programmes for monitoring all types of fluid lubricated and insulated oil systems. He said it allows operators to draw a sample fluid from their engine and send it to Exol and Maktec for comprehensive testing. The results are then posted online within 24 hrs giving guidance if the fluid needs to be changed.

"Working with Exol's Fluid Check system we can reduce unplanned downtime and unnecessary oil changes," he said. "Fluid Check is brilliant because it is so quick and can identify excessive fuelling and contamination, extend oil drain intervals and detect future failures before they happen. It helps us ensure products are meeting the approved specification and are working as they should while quickly identifying any faults. If faults are found this is where Maktec's engineers can provide immediate specialist advice and help."

Steve Dunn, Exol Lubricant's Sales Director, said, "We're delighted to have Maktec Marine on board and believe that we can work extremely well together, using our specialist experience and services to support our customers worldwide."

Mr Cornforth said Exol fitted with Maktec's ethos of long term care of customers engines at a reasonable cost. "At Maktec we take a holistic approach to machinery solutions," he said. "Instead of offering a quick fix, we discover the needs of a customer and anticipate how that equipment will evolve over time. The result is a

Mark Cornforth – owner Marktec Marine



lasting and cost-effective solution. We accomplish this through our commitment to advanced planning, extensive system and data analysis and offering innovative ideas and technology. Exol is an excellent partner as it is an established expert and has a name for excellence that Maktec feels follows our professional standards and business strategy." Exol operates its bulk blending operation at a plant in Rotherham Yorkshire.

SHELL:

Shell has opened an integrated lubricants and grease production facility in Tuas, Singapore. At 10 hectares, the site size is equivalent to almost 25 football pitches. It is Shell's 3rd largest lubricants plant in the world and 2nd largest in Asia-Pacific, capable of producing up to 430m litres (equivalent to 390 kilotonnes) of lubricants and greases every year - enough to change the engine oil of over 12,000 cars, every hour, every day.

Speaking at the opening, Huibert Vigeveno, Shell Global Commercial, Executive Vice President (including Shell Lubricants) said, "This state-of-the-art, highly automated facility in Singapore was built to support our business ambitions here in the APAC region. It serves as a strategic production hub, and will be the centrepiece of our lubricants supply chain network to reliably supply our world-class lubricants to millions of customers in the region. Asia represents over 40% of the world's lubricants demand, and is home to half of the world's largest lubricants markets.

"This facility will also further strengthen our marine lubricant business's presence here in Singapore, the world's second busiest port."

Lim Kok Kiang, Assistant Managing Director of the Singapore Economic Development Board, commented, "We are heartened by Shell's commitment to improving productivity through the adoption of innovative technologies, which is aligned with the strategies of the Energy & Chemicals Industry Transformation Map.

With a 50% increase in capacity and six-fold improvement in productivity over its previous plant, the new plant will be yet another great showcase of an Advanced Manufacturing facility that provides Singaporeans with good jobs."

The new plant will be a production hub for products that will be shipped to more than 40 countries, mainly in the Asia-Pacific region. It will produce lubricants carrying Shell's globally renowned brands, such as Shell Helix (passenger car motor oil), Shell Rimula (heavy duty engine oil), Shell Tellus (hydraulic oil), Shell Alexia (two-stroke marine engine oil) and Shell Gadus (greases).



Shell's Tuas Lubricants Plant

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CLASSNK:

Japan's ClassNK has released the latest version of Good Maintenance Onboard Ships (October, 2017). The comprehensive checklist is designed to be used by shipmasters, crew, shipowners, and other key personnel in order to ensure vessels are safe, well-maintained and comply with regulations.

To further improve the quality and efficiency of maintenance on-board ships, ClassNK has incorporated its knowledge and experience gained through surveys and audits, feedback from Port State Control (PSC) inspections, and comments from shipowners and mariners to provide the most up-to-date checklists for Routine Maintenance, PSC Inspections, Safety Management Systems, Ship Security Management Systems, as well as photos of the most common deficiencies. The latest edition now also includes a checklist for the Maritime Labour Convention, 2006 (MLC, 2006).

ClassNK's Director of Survey Operations Division Yoshinori Kozeki said, "This easy-to-use checklist is a result of our ongoing commitment to improve the safety of life and property at sea, and the prevention of pollution of the marine environment. The latest edition of Good Maintenance Onboard Ships includes clear explanations, photo examples as well as guidance on the latest updates in the industry. We hope that crews will utilise this to help create a safer work environment, decrease the number of PSC detainments and prevent maintenance related problems before they occur."

FEATURE:

WAR OF WORDS AS SHIPPING EMISSIONS DEBATE HEATS UP

Many of those in attendance at Europort in Rotterdam last week were marvelling at the clever technologies developed recently to improve shipping's environmental performance, raise energy efficiency and cut harmful emissions. Meanwhile, not so far away, the United Nations was hosting the first of two weeks of climate change discussions at the 23rd Conference of the Parties (COP23), led by Fiji, in Bonn.

These meetings take place every year and this is the first time that one has been held since President Trump won the US election and pulled the US out of the Paris Agreement, signed by nearly 200 countries in December 2015. It is also the first time that delegates have met since the White House revealed plans to promote coal, natural gas and nuclear energy as a means of tackling climate change.

Significantly, the US delegation in Bonn this week is about half the size of the US representation in Marrakesh last year. US Secretary of State Rex Tillerson, a former Exxon CEO, is not attending. And, despite warmer seas, shrinking ice cover to north and south, and a greater incidence of natural disasters, many of which strike the US itself and island nations nearby, those Americans who deny that climate change is happening are currently in charge.

Thankfully, most of these will have been and long gone by the time certain deadlines under discussion in Bonn loom closer. Despite the lack of US interest, however, these two weeks of talks in the German City have far-reaching implications for the global shipping industry and have led to some robust altercations in recent days.

As always in shipping, reaching a consensus on a reasonable timetable appears to be a principal sticking point and many of those involved are increasingly concerned that a divided shipping industry will not be capable of defending its position effectively. After all, there is no alternative to global seaborne trade and the world's shipping industry fulfils an essential function for humankind.

The International Chamber of Shipping (ICS) is representing national shipowner associations accounting for more than 80% of the world fleet at the Bonn talks. It has previously made clear its views on a realistic timetable for cutting carbon dioxide emissions. Its director of policy, Simon Bennett, has said that the ICS believes that shipping could achieve zero emissions of carbon dioxide in the second half of this century. "We are confident that this will be achievable with alternative fuels and new propulsion technologies," he has been reported as saying.

But this is not soon enough for some nations, notably a group of Pacific islands headed by the Marshall Is-

lands which are in danger of disappearing beneath the waves as sea levels rise. They have been calling for a much shorter timetable, and one that was slammed on social media last week by the ICS. A 100% reduction in shipping emissions by 2035, the ICS said, was “not possible” and it criticised the “inflexible and unrealistic stance” of the Marshall Islands, both in Bonn and at the IMO.

Of course, as a lobbying organisation representing shipowner groups, the ICS has its own axe to grind. But regulators agree that targets must be realistic if they are to carry any weight at all. They also insist that shipping must present a united front in the face of mounting and, many believe, misplaced criticism on its environmental performance.

Japan has previously promoted a target date of 2030 for a 40% efficiency gain compared with the base year of 2010, and 2060 for a 50% reduction in carbon dioxide volumes. These targets have been described by the ICS’s Bennett as “incredibly ambitious” given the likely increase in the world’s seaborne trade, but nevertheless “more realistic”.

There is no large-scale substitute for hydrocarbon-based fuel for ships today. Even LNG, as a marine fuel, is only just catching on, and still only cuts carbon emissions by 20-25% as compared with heavy fuel oil. To name a date for zero carbon emissions, therefore, within just one generation of ships – 2035 – is clearly ludicrous.

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ON WATCH:

ABB Marine & Ports has opened a new office in Ocean Village, Southampton, demonstrating the company’s continued commitment to the market in this region. ABB’s Philip Lawson, Head of Marine & Ports UK, said, “I’m excited to expand our Marine & Ports presence in the UK by opening a new office in Southampton. Our new office will work alongside our established office in Aberdeen and our ABB Turbocharger facility already in Southampton, supporting our customers across the UK and abroad. ABB is well positioned to support customers, through our digital expertise, product range and certified service team.

“The new office will also allow us to have a local presence to support our customers, as well as growing our Marine & Ports team in the UK. There is also an opportunity for innovative clean energy solutions within ports, and our focus is firmly on providing customers with opportunities to reduce carbon emissions.”

The opening of the new office comes at a time when the value of using marine digital services in today’s challenging market has never been more relevant. For example the vessels connected to ABB Ability™ Collaborative Operations Centres are continuously monitored, and the predictive analytics of digital solutions enable us to plan together with the customer preventive maintenance for ABB systems onboard the vessels.

There are multiple ways to ensure continuous operations and reduced downtime, all possible with marine digitalisation. The role of connectivity leads to reduced costs and increasing efficiency, whilst maintaining safety.

ABS has been authorised as a Recognised Organisation (RO) for Italy, giving the organisation the ability to carry out statutory reviews and certifications on behalf of the Italian Flag Administration. "This authorisation strengthens our offering to Italian flag vessel owners and provides a compelling option as they consider their classification and RO partner," says ABS Chairman, President and CEO Christopher J. Wiernicki.

"At ABS, we remain focused on our mission of safety and are continuously exploring new and expanding ways to advance that mission within the marine and offshore industries." Working closely with Italy's Ministry of the Environment and Protection of Land and Sea and Ministry of Infrastructure and Transport, this authorisation allows ABS to verify compliance of Italian flag ships with the major international safety and pollution prevention programs, the International Load Line, SOLAS and MARPOL Conventions.

V.Group has announced that Bob Bishop has been appointed chairman of Selandia Ship Management in addition to his current role in business development of the Group.

The acquisition of Selandia Ship Management in 2016 provided V.Group a unique opportunity to promote and develop a well-established specialist brand working in vibrant and developing markets. This appointment will allow Bob to focus and use his significant expertise to build on the quality reputation of Selandia to enhance and expand their current fleet of more than 140 vessels. In welcoming this move Martin Christiansen, Group Chief Commercial Officer at V.Group, said, "We are delighted to retain Bob's experience and passion for ship management. He is an important link in the continuity of quality service to our clients." Bob Bishop commented, "The acquisition of Selandia Ship Management provided us with an intriguing opportunity to further develop an already strong brand to meet tanker specific client expectations out of India and South East Asia. Service delivery and a passion for quality and excellence remain the best-selling tools and Selandia is a company with a well justified reputation for both. I am delighted to work with their excellent team as we seek to develop and enhance the satisfaction of our client base and in this way grow the business."

The **Schlemmer Group** has announced the appointment of Sven Schneider as Chief Financial Officer, effective January 1st, 2018. Schneider will succeed Christian von der Linde, who has served as Chief Financial Officer of Schlemmer since July 2012. Christian von der Linde will continue to serve as CFO of Schlemmer through December 31st, 2017 with the full support of the Board and management, and be available to Schneider during January 2018 to ensure a smooth and effective transition.

Sven Schneider brings 20 years of experience driving profitable, cash-generative growth for international, middle market companies. Schneider will join Schlemmer from Talis Group, a privately held company, where he most recently served as CFO. Prior to Talis, Schneider spent five years as CFO of Chemetall, where he significantly increased the company's sales and profitability through the successful financing and integration of multiple international acquisitions and other business development efforts.

The logo for SHIPPAAT, featuring the word "SHIPPAAT" in white, bold, uppercase letters inside a dark blue oval shape.