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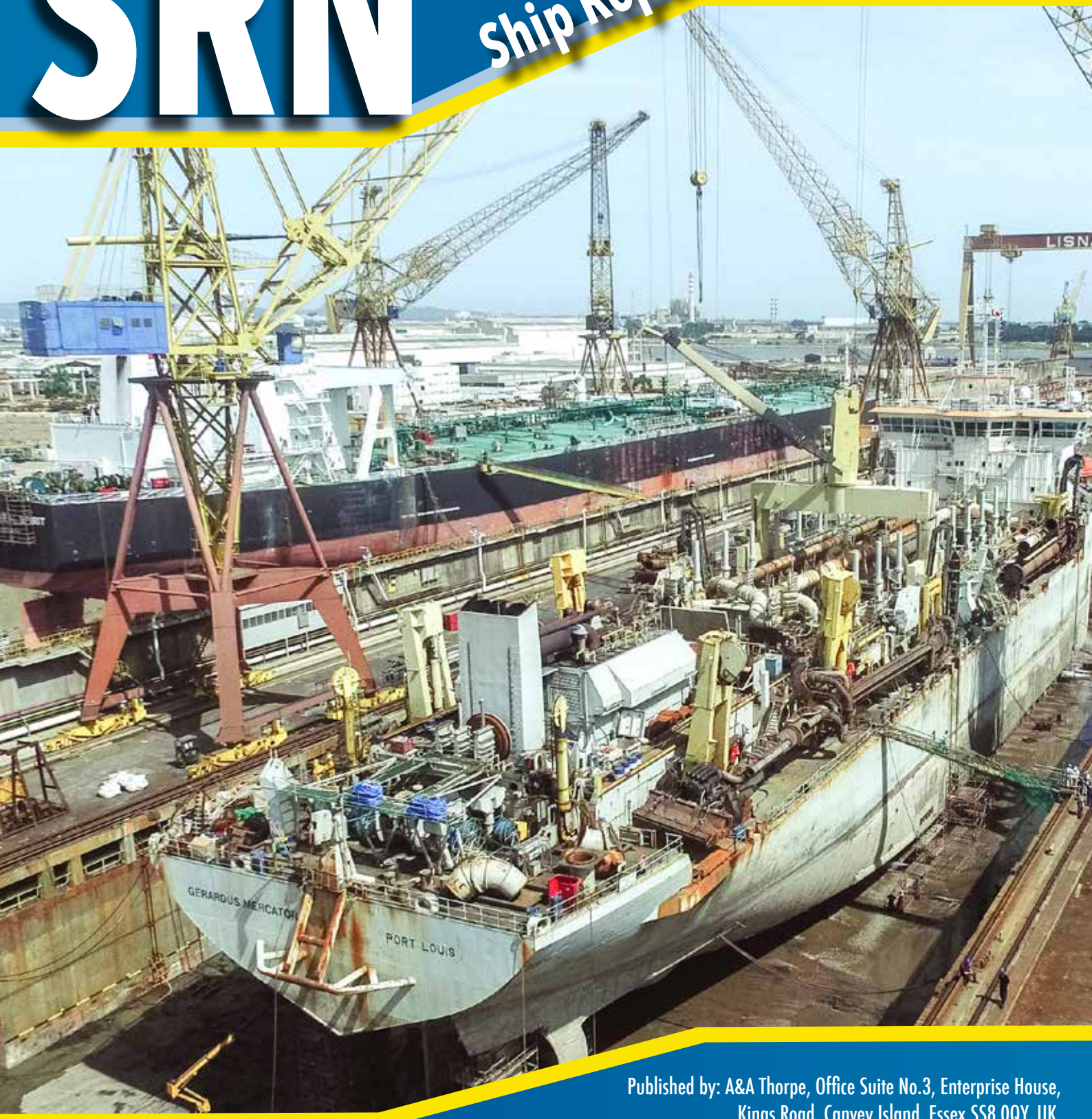
SRN Ship Repair Newsletter



Lisnave's Mitrena Yard in Setubal
(See Shipyards)

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VIEWPOINT:

BMT Surveys (BMT), a subsidiary of BMT Group has been engaged by Friend of the Sea to investigate whether specialised reefer vessels comply with the broad set of requirements to qualify for certification.

A non-profit and non-governmental organisation (NGO), the primary goal of Friend of the Sea is protection and conservation of a sound, sustainable and eco-friendly marine habitat in the oceans of the world. To help deliver its mission, the NGO introduced a certification project, the Friend of the Sea eco-label, for companies that demonstrably operate sustainably and eco-friendly in the worldwide fishing sector including cargo vessels. A recent addition is the specialised reefer vessels transporting fish and fish products from the place where they come ashore to their final destination, anywhere in the world; this is where BMT Surveys expertise has been drawn on.

BMT undertakes the investigation in two stages - firstly, verifying the certificates and other relevant documents required for obtaining and maintaining the eco-label. Secondly, each ship is audited onsite every couple of years by BMT's expert inspectors, to determine whether all the environmental and sustainability requirements are also met on board.

Director, Jeroen de Haas comments, "This commission recognises the knowledge and expertise of BMT's operating standards in the maritime industry. We are also pleased to contribute to a sustainable and increasingly eco-friendly society. Conservation of the natural habitat in the oceans of the world is very dear to the organisation."

SHIPYARDS:

ODD:

The ***Ortviken*** in Oresunds Dry Docks

Sweden's Oresund Dry Docks (ODD), located at Landskrona, has slowly built its reputation as a first class shiprepair facility in the Scandinavian market over recent years, especially with regular customers such as Viking Line, Finnlines and TT Line. With a history stretching back as far as 1915, the yard was taken over by Jonas Hansson in 2003 and has, since then, further enhanced the yard's repair and conversion facilities to a point where it is now a major player in the Scandinavian market.

Now the management team is looking to expand its potential market to cover other major European shipowner centres, which have ships operating in the Baltic area. An expansion of the yard's agency network is currently underway.

Many believe that the cost of shiprepair in Scandinavia is expensive – however, prices offered by ODD compare favourably against the German shiprepair industry, although still behind the former Eastern European yards in Poland, Estonia, Lithuania etc. Less deviation and a higher level of productivity, which result in on-time deliveries, are major factors in combating cheaper prices from Eastern Europe.

The yard operates a graving dock of 195 m x 34 m with two azimuth pits: 9 x 5 m, depth 4.9 m, and 14 x 9 m, depth 3.5 m, and a floating dock of 165 m x 28 m, also with two azimuth pits: 5.5 x 2.4 m, depth 2.65 m, and 3.5 x 6 m, depth 3.3 m). There are also quayside facilities measuring some 800 m with depths up to 8 m.

The repair facility is located on the former shipbuilding yard and as such has some extensive facilities, especially steel and mechanical workshops. The facility is also the headquarters of Enercon´s Swedish subsidiary EWP, which manufactures wind farm towers, Marinspect, involved in life-saving equipment, PMK Marin, suppliers of shipyard workers, AlfaTest, specialists in UTM and the yard has its own paints and coatings facility, operated by the world-wide coatings specialist Premator. The yard also operates an effective and efficient GRE workshop, which has been useful for ODD when completing 'scrubber' installations.

There is a development programme underway, whereby facilities can be made available to other industrial companies, the possibility of a new drydock and the refurbishment of the existing newbuilding slipway, if a newbuilding contract can be won. The latest newbuilding contract carried out by the yard was in 2009 for a seismic vessel hull, and during previous years hulls were also produced for various cruise/passenger vessels such as the cruise/residential vessel The World, which was built during 2002, Hurtigruten, and ANEK Line.

So far ODD has carried out two 'scrubber' installation projects this fiscal year involving two passenger/car ferries owned by TT Line – the 26,790 gt ***Nils Holgerson (2015/16)***, and Bornholmer Færgen's 13,906 gt ***Hammerodde (2015)***. The scrubber equipment was supplied by Ecospray (Italy) and PureteQ (Denmark) respectively. A third project, involving TT Line's 34,468 gt ***Peter Pan*** will be carried out during December this year, again using an Ecospray system.

The first 'scrubber' installation was carried out by ODD was some two years ago involving TT Line's 26,790 gt ***Robin Hood***, using a Wärtsilä system. The second project involved GoTaShipmanagement's 23,128 gt ro/ro-cargo vessel ***Transtimber,*** which was completed in 2014, the system being supplied by Singapore's Ecospec. The 'scrubber' installations in ODD have so far been carried out as sub-contractors appointed by the manufacturer. However, owners are now talking to ODD to use the yard as the main contractor in future projects.

During recent weeks ODD has carried out general repair work on-board TT Line's 38,468 gt ***Nils Holgerson***, work carried out while the vessel is in service, ESL Shipping's general cargo vessel 13,340 dwt Tali, the Swedish-owned ice-breaker Ymer, SCA Transforest's 20,154 gt ro/ro-cargo vessels ***Ortviken, Obbola and Östrand***, GoTaShipmanagement's 18,377 gt ***Transreel***, Uman Shipping's 4,267 dwt general cargo vessel ***Listerland***, Eimskip's 3,546 dwt general cargo vessel ***Langfoss***, Island Offshore's 4,841 gt OSV ***Island Centurion***, and another general cargo vessel from the Eimskip fleet – the 3,625 dwt ***Stigfoss***.

Due in the yard are Veder Redrij's 6,875 dwt LPG tanker ***Coral Ivory***, which will be in the yard for a five-day side shell damage repair operation, Finnlines' 28,002 gt ro/ro-cargo ferry ***Finnsky***, due in for annual drydocking work, two more ro/ro-cargo vessels from operated by GoTaShipmanagement – the 23,128 gt ***Transpaper*** and her sistership ***Transpulp***, two ferries from Scandlines – the 11,148 gt ***Tycho Brahe*** and the 20,381 gt ***Aurora***, Ektank's 17,006 dwt chemical tanker ***Ekfjord*** and one ferry from Destination Gotland, the 29,746 gt ***Gotland***.

LISNAVE:

During the first half of 2016, Portugal's Lisnave repaired a total of 31 vessels from 20 Owners from 14 different countries, a lower number than in the same period of last year (53). The nations with the largest number of vessels repaired at Mitrena shipyard during this first half were Greece with eight vessels of four different owners, Singapore with five from two owners, Germany with four vessels from two owners and Brazil, Italy and Venezuela, each with two vessels.

Lisnave with its know-how recognised by its clients continues to develop repeat business, such as repairs for Teekay Shipping (Singapore and Brazil), Tsakos Columbia Shipmanagement (Greece), AET Shipmanagement (Singapore), E.R. Schiffarht (Germany), PDV Marina S.A. (Venezuela) and Augustea Due (Italy).

Tankers continue to be the largest type of vessels to visit Lisnave, being repaired during this period 25 tankers, container vessels (4), general cargo vessels (1) and cruise vessels (1). From the several repaired carried out during the first half of 2016, major repairs and maintenance works were carried out on three shuttle tankers with dynamic positioning class DP2, on a MCV (tanker converted in to a (Modular Capture Vessel) to operate in the Gulf of Mexico to prevent major oil spills overseas) and two Venezuelan tankers.

BESIKTAS:

During the first half of 2016, the majority of the repair projects carried out by Turkey's Besiktas Shipyard involved containerships and chemical tankers from Danish ship owners. The shipyard secured more than 20 projects from Maersk and Norden within this period.

Projects in the yard in recent weeks include Ahrenkiel Steamship's 56,799 dwt bulk carrier ***AS Virginia***, NGM Energy's 13,040 dwt chemical tanker ***Triple A***, Team Tanker's 8,824 dwt chemical tanker ***Sichem Ruby***, Ancora Investments' 37,211 dwt chemical tanker ***Angi***, the 28,451 bulk carrier ***Clipper Iyo*** and Norden's 37,145 dwt chemical tanker ***Nord Highlander.***

Repairs being carried out on-board ***Angi*** include extensive recoating work in her ballast tanks and stools. Besiktas has carried out very similar projects previously with Italian and German owners. Apart from work in the ballast tanks, there is also an extensive amount of steel and pipe to be renewed.

Work on-board the ***Sichem Ruby*** includes overhauling of deck machinery, main engine and electrical motors, steel renewal in the ballast tanks and stainless steel pipe works on the deck area.

August is expected to be quite busy with Pure Car Carriers (PCCs) from different ship-owners. The fact that Izmit Bay is one of the most important hubs in Turkey for PCCs - yard is also very familiar and can easily overcome the difficulties, which can be faced during PCC repairs. Starting from 2009, yard has carried out more than 30 drydockings of PCC's in the Panamax size graving dock; which is quite suitable for ramp repairs and silicone paint applications

The ***Anji*** in Besiktas

EBHN:

Southern Africa's Elgin Brown & Hamer (EBH) Nambia (EBHN) has announced that it has secured an agreement with the Mining, Metal, Maritime & Construction (MMMC) union, resulting in the company withdrawing its intention to embark on unilateral retrenchments.

"We are extremely pleased to have concluded an amicable agreement with the union regarding the retrenchment process, following some two months of constructive engagement and negotiation. To arrive at a mutually agreed solution is a positive step forward for both parties; as well as being in the best interests of our employees," says Hannes Uys, Chief Executive Officer at EBHN.

EBHN Management and the union agreed on several points relating to the retrenchment process, including terms surrounding an early retirement option and the criteria for selecting those employees to be retrenched.

"It has been an extremely challenging time for all of us at EBH Namibia, and particularly for those affected by the retrenchments. To lose some of our valued staff is deeply regrettable, and we have made every conceivable effort to ensure the least number of retrenchments as possible under the circumstances.

"It has always been our policy to care for our people as individuals, team members and valuable contributors to the success of the company. It is our sincere hope that the financial support provided to those affected by this process will be of real assistance to them as they go forward in their lives and careers," says Uys.

EBHN announced its stabilisation plan in April 2016, in the wake of a 50% decline in revenue as a result of the sustained low oil price and subsequent decrease in docking activity. The stabilisation plan included first and foremost several 'non-HR' performance improvement projects (PIP) and cost-cutting initiatives.

"Our PIP initiatives are not only aimed at short-term cost reduction and performance improvement; but will be the essential operational 'compass' by which we will steer this 'ship' going forward to ensure that we are sustainable in the long-term," Uys points out.

For EBHN, retrenchments were a 'last resort' which was unfortunately unavoidable, given the current oil crisis and prevailing market conditions.

"It was crucially important to appropriately re-size and scale the business in accordance with prevailing market conditions; in order to ensure the company's continued viability and long-term sustainability.

"It should be noted that, while we are now looking forward to a resurgence of the global oil, gas and maritime sector (conservatively projected for mid-to-late 2017), we are also exploring a number of diversification opportunities in order to decrease our exposure in only one key market.

This is also part of our 'PIP' and continuous improvement approach moving forward, ensuring we are able to be agile and flexible, with a more diverse offering to our clients.

"Skills retention is critical to our business going forward, to ensure our well-known high levels of quality and client service continue. To this end we have taken a very strategic and selective approach to our re-sizing process, to ensure that the company is still appropriately resourced and can quickly and effectively respond to any market resurgence going forward. Creating a better level of flexibility in terms of staff numbers in relation to project activity, I believe, will serve us well in the future.

The 'Namdock' floating dock at EBHN

"This agreement represents an extremely important milestone in our stabilisation process – the final results of which we will measure at end of our current fiscal year in March 2017. Ultimately, this agreement together with our stringent adherence to the ethos of PIP and continuous improvement going forward, will pave the way for EBH Namibia to continue our role as an important contributor to Namibia's economy and as a major service provider on the west coast of Africa, to the international maritime and offshore oil and gas industry," Uys concludes.

ASTILLERO MARIO LOPEZ:

Spain's Astillero Mario Lopez, Malaga, part of the Cernaval Group drydocked the former Moroccan-owned 12,175 gt ro/pax ***Le Rif*** on July 23rd for 10 days of inspections before the vessel's new, unnamed owner decides on further repair work. The vessel started life in 1980 as ***Stena Galloway*** running across the Irish Sea. She had been laid-up in Tangier since 2013 following a major machinery breakdown and the bankruptcy of her owners IMTC. ***Le Rif*** was towed from Morocco to Malaga.

ABU DHABI SHIPBUILDING:

The Middle East's leading builder of naval vessels, Abu Dhabi Shipbuilding (ADSB) has just taken delivery of a 10,000 tonne lifting capacity floating dock from Turkey, which it expects to spearhead ADSB's move into the local and international shiprepair market. The new floating (180 m x 30 m) is moored in the deep draught Mina Zayed port, alongside a new large repair quay. Prior to the arrival of the floating dock, ADSB's repair activities were restricted to vessels up to 80 m in length on its 2,000 tonne capacity Syncrolift shiplift and transfer system.

The first vessel to be repaired in the floating docks was the 1,517 gt 2008-built OSV ***Bourbon Liberty 108***, owned by France's Bourbon Offshore. Work on this vessel included hull blasting and painting, engine room repair and deck repairs. The second vessel to repair in the new facility was the 8,830 dwt 1979-built cement carrier ***Raysut I***, owned by Greece's Sekur Holdings. Work on this vessel involved underwater hull damage repair and re [pairs to the vessel's fire damaged accommodation.

ADSB is looking to significantly increase its shiprepair business, which currently accounts for 10% of its revenue. It hopes to increase this figure to 50% by 2020 and to achieve this ADSB is currently expanding its worldwide agent's network. Currently the yard is represented by 15 agents in Europe and the Far East.

PRIME MERIDIAN DOCK:

UK's Rigmar Services, Aberdeen has been awarded the management contract for specialist offshore oil and gas repair and maintenance operator Prime Meridian Dock in Takoradi, Ghana. Rigmar will be involved in both technical and commercial management of the shipyard, as well as being responsible for delivering inspection, maintenance and repair services onboard ships and rigs, as well as providing support to offshore projects throughout the region, particularly during mobilisation.

Prime Meridian Dock is West Africa's latest repair and maintenance facility and also offers layup/stacking services, as well as reactivation and preservation services. The company has ambitious plans for its yard in Takoradi, which currently can only carry out alongside work. However, plans are in hand for a floating dock (size not yet disclosed) and a 330 m repair quay. The new shipyard has been granted a 25 year concession by Ghana's Port & Harbours Authority.

SEMBCORP MARINE:

P&O Cruises (Australia) will drydock its 70,285 gt 1991-built ***Pacific Dawn*** at Singapore's SembCorp Marine's Admiralty Yard for a multi-million $ refit at the end of February 2017.

During the refit the vessel will be fitted with a new waterpark featuring two large water slides, an interactive children's play area and The Pantry – an international marketplace replacing the existing buffet area. Following next year's refit ***Pacific Dawn*** will start year-round cruises from Brisbane.

BOILER REPAIRS:

NICO INTERNATIONAL:

Dubai's Nico international has entered into a long term collaboration agreement with Denmark's Global Boiler. The aim of this alliance is to further strengthen the power & energy capabilities of Nico in the field of marine and industrial boiler service market in the Middle East region.

Through this partnership Nico International & Global Boiler wish to co-operate and broaden its portfolio to cover industrial and marine power projects and boiler maintenance, repair and operation in the entire Middle East region.

"Considering the market trends and Nico's vision of being the best overall Marine & Industrial solutions provider, this partnership with Global Boiler is a significant step for Nico in becoming an even more attractive market player" says John McFadyen – General Manager, Nico International.

Uffe Nyborg Johansen, CEO of Global Boiler adds, "This new partnership with Nico will further introduce the engineering skills from Global Boiler for boiler repairs and service into the Middle East market. Further the skilled manpower from Nico combined with the experience and knowledge base from Global Boiler will be sure to give a strong local base in Dubai – an important supplement to our presence in Denmark and Singapore."

John McFadyen (General Manager – Nico International) and Uffe Nyborg Johansen (CEO – Global Boiler)

OUTFITTING:

MCCUE MARINE:

UK's McCue Marine has handed over areas on-board Cunard's luxurious flagship, ***Queen Mary 2***, the iconic 2,620 passenger ocean liner, after a 25 day, multi-million-pound drydock at Germany's Blohm & Voss Shipyard, Hamburg, between May 27th and June 21st 2016.

The update of Cunard's flagship liner marked the 176th birthday of Cunard, which was voted 'Best Large Cruise Line' in the 2015-16 Telegraph Travel Awards. The £90m refit is the largest overhaul ever taken by Cunard.

In partnership with SMC Design and Harding Retail, McCue Marine upgraded the Mayfair Shops, Queen's Grill and Princess Grill restaurants, in addition to the Grills Lounge and Verandah restaurant. The Cunard Grills' experience affords the line's most selective of guests the highest of standards and comfort at sea and is the very apex of luxury in ocean going travel.

QM2's Queen's Grill Restaurant

McCue's wealth of 'high street' fit out experience was also a key factor in securing an extensive remodelling in three of the outlets in the Mayfair shop area on board on Deck Three, housing designer brands of fine jewellery, watches, fashion accessories and apparel.

Stephen Mills, Business Development Manager, McCue Marine said, "With dedication and many long days of hard work, the McCue Marine management team and refit operatives not only delivered a quality product but managed to hand over the completed areas extremely efficiently. This underlines the company's dedication to best practice, and emphasises that we go above and beyond to ensure that our service is unrivalled and as professional as possible.

"The initial contract with Cunard doubled in value due to the company being asked to tender for more areas on board the ship, another accomplishment we are very pleased of as it speaks volumes of our experience in the industry."

Originally, McCue Marine was due to upgrade the Queen's Grill, Princess Grill and Verandah restaurants, in addition to the Grills Lounge. However, they were then invited to tender for work on the retail areas of the cruise liner, the Mayfair Shops, due to the company's broad work and knowledge in the retail industry.

Stephen added, "We are incredibly proud of the McCue team involved with this project. They put in long hours to ensure the project was finished to the exceptional standard required and expected by the company. SMC Design and Harding Retail have also been a pleasure to work with, and we hope to work with both companies again in the future."

INTELLIGENT ENGINEERING (IE):

The 127,500 dwt ***Solitaire***, one of the world's largest pipe-laying vessels, has completed some of the most challenging projects, during which heavy pipe was laid in ultra-deep waters. Originally built in Japan as a mini-Capesize bulk carrier, she was converted to a lay-pipe vessel in 1998. She has full dynamic positioning and can carry a pipe payload of 22,000 tonnes.

Recently, however, the vessel's operator, Holland's Allseas, decided to repair parts of the 550 m2 tank top in hold No. 6 which had corroded. After a detailed assessment was carried out, Allseas opted for SPS technology instead of steel renewal.

"Such a project undertaken in steel was neither practically nor economically feasible," explains IE's Nash. "Conventional methods would have drastically increased the project duration and had an impact on total cost. However, using SPS technology, we were able to complete the tank-top upgrade successfully in just 10 days - five days ahead of schedule - far less time than an equivalent steel repair would have taken. This resulted in the off-hire period being significantly reduced."

The project, undertaken with Lloyd's Register (LR) class approval at United Stevedores in Amsterdam, involved blasting the existing tank top, attaching and welding bars and adding an additional layer of steel plate to create a cavity. All steel work was undertaken by IE's licensee, SRC Group AS, with the polyurethane injection conducted by IE engineers.

Allseas' Manager Technical Department, Quirien Grul, commented that the company was very pleased with the outcome and the professional and efficient execution of the work undertaken by IE personnel. "I am very pleased with the performance and will consider using IE again should a similar project have to be undertaken in the future."

Allseas' ***Solitaire***

HISTORICAL REPAIRS:

PSM INSTRUMENTATION:

UK's PSM Instrumentation is normally known for its projects with tankers, trawlers, naval ships and offshore vessels, but was recently selected to work on the restoration of the historic superyacht ***Malahne***.

The 50 m classic ***Malahne*** was relaunched earlier this year at Pendennis Shipyard, Falmouth, UK after a massive and meticulous 30 month restoration project, which has restored her to her original pre-war glory, yet at the same time fully modernising her.

Designed by Charles E Nicholson and built by Camper & Nicholsons in 1937, ***Malahne*** is one of a small number of pre-war motor yachts to have survived until the 21st Century.

Nicholas Edmiston, Chairman of Edmiston & Company, had followed the chequered history of the yacht for decades and in his own words, "I was fortunate to interest an owner who understood and embraced this vision, and who entrusted Edmiston to pull together a team that could bring ***Malahne*** back to life." Nick subsequently organised a project team and shipyard, which shared the passion and transformed this dream into a reality.

PSM was chosen to work on this historic project to update the transmitters and switches on board for all service, fuel oil and fresh water tanks. The restoration required that the very highest quality materials were used throughout, and PSM's approved transmitters and switches were selected based on their proven performance in the harshest of conditions.

The ***Malahne*** has undergone one of the most ambitious restorations of all time, and PSM had been delighted to have played a role in this.

BMT:

BMT Designers & Planners, a subsidiary of BMT Group is leading the effort to repower the historic US Coast Guard training barque, ***Eagle***. The $1.5m (approximately) project involves engineering, design, supply and logistics support to install a new MTU 8V4000 engine, ZF gearbox, propeller, automation system and other related components. While the vessel is frequently operated under sail by U.S. Coast Guard Academy cadets, she routinely employs an auxiliary propulsion system for use during manoeuvring and when sails cannot be utilised.

BMT's scope includes providing the complete work package of design plans and specifications, engineering data for provisioning, technical manuals, training, on-site and post-availability technical support. With the support of its suppliers, BMT will also be providing all of the equipment to the Coast Guard Yard in Curtis Bay, Maryland for installation on the vessel in the winter of 2017-18.

"The project presents some unique engineering challenges, and it is exciting to be involved in extending the life of this majestic historic vessel," says BMT's Project Manager Emily Whitman, PE. The project is Ms. Whitman's first major assignment since joining the firm five months ago.

BMT will partner with Johnson & Towers (J&T), a fourth-generation family-owned business and the distributor for the Rolls Royce Power Systems Company, representing the full line of MTU engines. As BMT's sub-consultant, J&T is supplying the engine, gearbox and other components for the project.

CONVERSIONS:

KR:

The Korean Register (KR), an IACS member classification society, has announced that it has successfully completed a feasibility study for the conversion of an 8,600 teu containership into a 10,000 teu vessel.

This new capacity specification was developed in response to a shipping company's desire to adapt to recent shipping environment changes and to improve operational efficiency. In recent years a change in the optimal size of vessels and a deterioration in the operational efficiency of existing ships, has led to newbuilding orders or the conversion of existing ships.

KR offered the shipping company two scenarios for the study. One was a traditional method, to increase the size of the vessel by lengthening the ship, while the other used a more recent approach, whereby the vessel's breadth would be expanded, which was used by NSB group last year.

Using both of these methods, KR analysed the new vessels potential speed, fuel efficiency, stability and strength, the cost and time needed for conversion, the size-expandability, the new vessels manoeuvrability and it's anchoring.

Looking at the speed analysis, while both options showed a 4% drop after conversion, the length extension conversion was one knot faster than its width expansion counterpart. For fuel efficiency, the length extension conversion consumed 5% less than the alternative vessel.

In terms of stability and strength, the widening conversion showed improved stability, with almost no need for additional reinforcement to enhance the vessels strength. However, the lengthening scenario, the vessel stability was unaltered but it needed much more reinforcement on its deck and bottom parts to maintain its strength, because of the increased hull bending movement.

The study showed in general that the widening conversion would increase cargo carrying capacity by up to 30%, but in the lengthening scenario, capacity only increased by 15%.

It would take twice as long to make the changes to the widening conversion, compared to the time it would take to convert the vessel using the lengthening scenario. There would be no difference in the cost of conversion to either option, because the lengthening conversion requires more steel work. Lastly, the study found that the two options were almost the same in terms of manoeuvrability and anchoring.

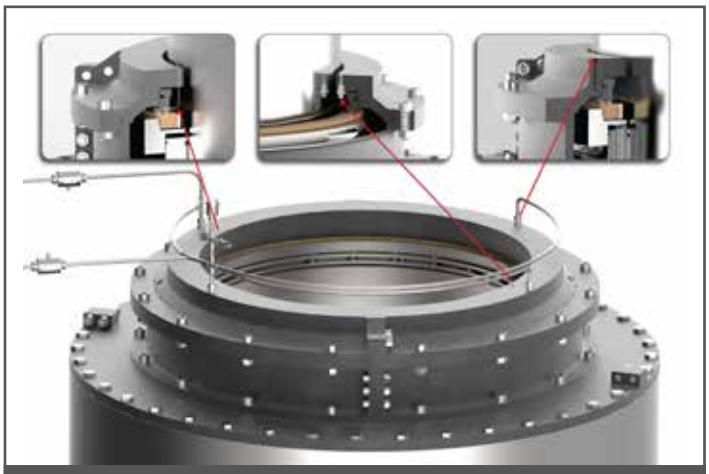
Commenting the study, Dr. C. W. Kim, Executive Vice President, Technical Division of KR said, "The cost to complete a ship conversion is only around 15% of the cost of a comparative newbuild and the conversion time required is considerably shorter. Therefore, it can be a great alternative to placing a newbuilding order. This study is just one of the ways KR works with its customers to evaluate different options to optimise their business profitability."

SEALING TECHNOLOGY:

WÄRTSILÄ:

Wärtsilä's new digital management system revolutionises sealing technology in the hydropower industry. The system incorporates machine learning, predictive modelling and model predictive control (MPC) techniques to provide customers with intelligent, real-time active management of the sealing interface fluid film, minimising wear and removing the sealing components from the maintenance schedule critical path.

"We have increased our focus on the development of digital asset management and real-time performance optimisation solutions for seals to provide our customers with greater predictability and reliability. We want our customers to feel confident that their operations will not suffer from unexpected interruptions that can become costly. With the Wärtsilä REvolution system, customers can focus on their core business and leave lifecycle management entirely to Wärtsilä," says Harald Brodmann, Hydro & Industrial segment manager from Wärtsilä.



The Wärtsilä Revolution system

The launch of this new system follows a previous product development in hydropower shaft seal applications and utilises Wärtsilä REguard shaft seal technology. In 1988, Wärtsilä launched the first face type shaft seal for hydropower turbines, which included a pressurised interface management system. Since then, there have been over 100 installations of this system around the world. The Wärtsilä REvolution system has now elevated this technology to the next level with the introduction of a digital control system.

The Wärtsilä REvolution system's primary application is hydropower turbine shafts, but the system can also benefit industrial applications, including pumps and other large rotating equipment. It also serves as a basis for future development, offering continuous data on product performance in the customer's specific operating environment. The Wärtsilä REvolution system collects performance data, for example temperature, wear of the seal interface and pressure, and enables real-time lifecycle prediction and intervention to reduce friction and wear of the seal. It also protects the seal from contaminants. The system analyses the collected data to actively optimise the seal performance in real-time.

In addition to the Wärtsilä REvolution system, Wärtsilä offers a comprehensive package of seals, bearings and associated solutions to hydropower installations and industrial plants worldwide. Wärtsilä's Hydro & Industrial services offering targets the specific needs of hydropower, tidal energy and offshore wind installations as well as mining, paper, oil & gas, water management and power generation industries.

CLUTCH DESIGN:

WARNER ELECTRIC:

Saving space and reducing weight are two of the biggest challenges for engineers working in the marine industry. Every cubic foot or kilogramme saved results in reduced fuel consumption or improved payload. So, when one powertrain manufacturer designed a remote PTO solution which would allow pumps to run from the main engine - thus eliminating the need for a secondary engine - there was immediate interest. At the heart of the new design was a clutch from Warner Electric.

In the offshore, marine and oil and gas sectors most workboats and dredging vessels require large hydraulic pumps for their operations, as well as fire pumps for emergency situations. These pumps often require between 300and 500hp to operate, meaning that they are often run from secondary engines. Not only is this an inefficient solution, there is also an inherent delay as the engine comes up to speed which could be catastrophic in an emergency situation.

The pumps have to be run in this way because of an inherent shortcoming in remote Power Take-Off (PTO) systems for diesel engines. This shortcoming was identified by a leading marine and industrial powertrain manufacturer who noted that most transmissions have one or more PTO locations, but these only allow for a fraction of the transmission's capacity to be transferred and often offer a limited footprint for ancillary equipment. If a more efficient solution could be designed then, for many applications, the pumps could be run from the primary engine – a far more efficient solution.

The assembly is designed to be driven from the front of the crankshaft, enabling it to run general purpose hydraulic pump drives, fire pump drives and other secondary drives from the primary motor. Part of the design required a remote operated clutch with proven reliability in the harsh marine environment. The manufacturers approached Warner Electric, part of Altra Industrial Motion, for a solution. The SFC-1525 stationary field clutch was selected due its size and design, remote electrical activation and reputation for reliability offshore.

A spokesman for the manufacturer comments, "Finding a remote clutch that met our performance requirements and also fitted to the necessary footprint was key to the project. Warner Electric was one of the few manufacturers that was able to deliver on all of our requirements, and when we started looking at reliability records and service support it was obvious that they represented the best value for money.

"The remote PTO has proven to be extremely popular, especially as many boats are currently undergoing upgrades to more fuel efficient engines and our system allows them to continue to operate secondary drives from these.

"Because the PTO is driven from the crankshaft it is driven in a left hand rotation; this isn't a problem for most pumping applications as all hydraulic pumps and most fire pumps are available in this configuration. For other applications which require right hand rotation, an integral parallel shaft gearbox is available – this is possible thanks to the small footprint of the Warner Electric SFC-1525 stationary field clutch."

The remote PTO has now been commissioned on many different vessels operating around the world. The clutch can be engaged in about a second, giving the crew almost instant access to the secondary systems driven by the PTO.

Warner Electric engineers are experienced in designing bespoke solutions for marine, offshore and oil and gas applications. As part of Altra Industrial Motion is has access to a global support network, meaning it is able to offer on-hand specification, installation and maintenance support anywhere in the world.

CRUISE REFIT:

SILVERSTREAM:

"Cruise operators want cost effective solutions that are easy to retrofit, simple to operate, deliver the efficiency benefits that are claimed, and do not take up a significant amount of space, which impacts revenue generation. The Silverstream System meets all these criteria while, demonstrating a clear return on investment. For this reason, we are seeing increased uptake from the cruise sector." says Silverstream Technologies' Noah Silberschmidt, CEO.

Silverstream Technologies, the pioneer of air lubrication technology for the shipping industry, today stated that it is the cruise sector that is showing substantial appetite for its clean technology. This is driven by a commitment to corporate social responsibility (CSR), as well as impending changes to MARPOL Annex VI regulations where increases in the operational efficiency of vessels will be critical to reducing fuel burn and associated costs.

Silverstream already has a contract with Norwegian Cruise Line (NCL) and is in advanced discussions with a number of other cruise operators who are looking to implement the company's ground-breaking air lubrication technology, the Silverstream System.

"Many cruise lines have already seen a rise in fuel costs due to the significant amount of time that they operate within the 0.1% ECA zones. These costs will only increase further when the global 0.5% limit for sulphur in fuel comes into force in 2020, which is the anticipated date of implementation for the regulation", Silberschmidt continued.

Silverstream is in advanced discussions with a number of other cruise operators who are looking to implement the company's ground-breaking air lubrication technology

"In conjunction with the growing commitment to sustainability, given the consumer-facing nature of the sector, we are seeing considerable interest from cruise operators who want to offer assurances to their customers that they are proactively looking to minimise the environmental impact of their operations. They are doing this by getting ahead of regulations and implementing proven clean technologies that increase efficiencies and reduce fuel consumption and associated emissions."

Data gathered from sea trials conducted with Shell and on-going testing over the past 24 months shows that the Silverstream System can deliver average net efficiency gains of 5% for tankers and 8% for larger, full bodied vessels like LNGs. The technology is the only air lubrication technology available which can be installed to both newbuilds and retrofits, even during a short dry docking. Most significantly, the Silverstream System uses 66% less energy than other air lubrication systems to power the compressors which keep cavities filled with air at the required pressure. Additionally, comparative air lubrication systems for cruise vessels use a greater number of larger compressors and air pipes, requiring significantly more space within a vessel's hull. This increases the complexity of engineering, and greatly extends the time required to implement other technologies. The simplicity of retrofitting the Silverstream System means less downtime for vessels, and also reduces the cost of the technology by as much as 30%, compared to competitor products.

UNDERWATER REPAIRS:

HYDREX:

Work on the propeller by a Hydrex engineer

Recently, a team of Hydrex diver/technicians performed a propeller blade cropping on a 190 m container/bulk carrier berthed in Hamburg. Two parts of the tip of one of the four propeller blades were damaged and needed to be cropped to restore the propeller's efficiency.

Having developed different procedures for different kinds of damage, Hydrex teams are equipped and trained to make the best out of a bent or broken propeller. Ideally, the in-house developed cold straightening technique is used. This procedure enables Hydrex technicians to straighten damaged blades in-water, allowing commercial operations to continue without the need to drydock.

In the following example cropping was the only option as the type of damage to the propeller blade did not allow cold straightening. This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department. In cases like this, where there is an even number of blades an identical piece will be cropped from the opposite blade to restore the hydrodynamic balance of the propeller. By doing so, the best possible efficiency is obtained.

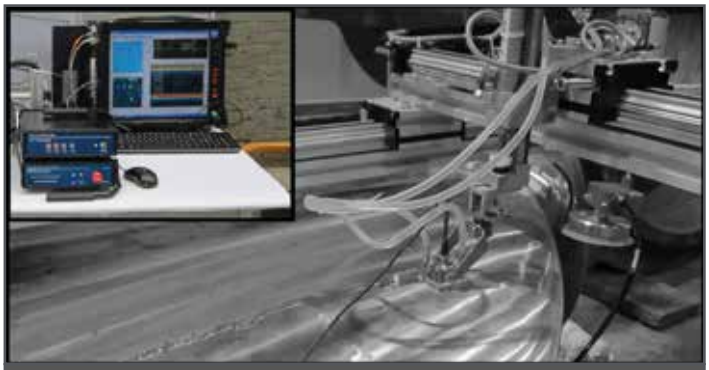
One of the four blades of the bulker had lost two parts of its tip. An on-site solution was needed to restore the propeller's balance and efficiency. A team was therefore mobilised from our headquarters in Antwerp to the ship's location in Germany.

After the equipment arrived at the vessel's location the team started the operation with a detailed survey of the affected propeller blade. The team then used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the trailing edges of the propeller blade. Next the divers cropped the blade and ground its edge to give it the correct radius. The opposing blade was modified using the exact same cutting line, to give the propeller back its balance.

When the cropping was complete, the Hydrex technicians buffed the blades to make sure that any remaining loss of efficiency would be minimal.

Over forty years of experience with propeller repairs have given Hydrex the tools and know-how to offer fast repair and modification services to vessels around the world. All types of operations can be carried out fast, fluently and efficiently afloat and underwater. In this case the repair took less than a day. This prevented any unwelcome delay to the vessel's schedule.

MPR:



The MPR ultrasonic testing system

It is well know that during the casting of ship propellers small pores and tiny cracks may often arise within the material, which can lead to failure if not repaired. Until today testing for defects has been carried out manually. However it is difficult to achieve consistent and reproducible results with such manual processes. To overcome this problem Holland's Marine Propeller Repairs (MPR) has, in collaboration with a specialised systems office, developed a new automated ultrasonic system for inspecting marine drive components, such as ship propellers.

A small lightweight measurement system is used with a mobile scanning device. The system includes all hardware and software components including instrument control, motion control, data acquisition, fast imaging of A-, B- and C-scans, evaluation and documentation tools.

The system is capable of recording large amounts of digitised ultrasonic testing data in real-time. On-site, the system currently scans an inspection area up to 900 mm x 450 mm and achieves speeds up to 200 mm/sec. The mobile inspection system can be freely positioned on the propeller geometry; alternatively the scanning device can be attached by suction cups in vertical and horizontal positions.

The mobile inspection and scanning system is available for on-site inspections in foundries, at propeller manufacturers and in dry dock. The use of the system reduces the time for defect inspection and makes the interpretation of the results far easier and more reliable.

PIPEWORK REPAIRS:

MIKO MARINE:

A kit that can be used to seal leaks in high pressure pipes has been developed by Miko Marine in response to a specific request from St1 in Norway. Detailed study by Miko has resulted in a system that uses specially formulated rubber patches that are slid over a leak and held in place by ratchet straps. The kits can be used to seal leaks in pipes ranging from 50.8 mm to 508 mm (2-inches to 20-inches) in diameter and can cover holes up to 25.4 mm (1-inch) across. Extensive testing by the Miko development team has demonstrated that users who employ the correct application technique can successfully seal a leak through which liquid is escaping at pressures up to 10 Bar. The success of the development has resulted in Smart Fuel – which is owned by St1 and operates Shell's gas station network in Norway – buying 16 kits which have been distributed among its storage tank farms where they are now available in case of emergency.

Tom Solhaug, Manager of the Sjurøya Depot in Oslo, who took the initiative and was responsible for the procurement of the kits at St1, says, “We are very happy with the final product as it is very reassuring for us to know that we now have the ability to cope with leaks in a quick and professional manner. By adding the pipe sealer kits to our emergency repair equipment we are now better prepared to deal with any problem, which must be as reassuring for our neighbours as it is for our own personnel.”

By using a specially formulated rubber for the patch it is possible to achieve the optimum sealing performance regardless of the nature of the liquid that is escaping. This also makes it suitable for use in many areas of the offshore oil and gas industry as well as the marine, chemical and construction industries and also for naval and armed forces applications.

The pipe repair kit has evolved from Miko’s tank sealer kit which is being used to equip tank storage facilities where any leaks could prove costly and environmentally damaging. As tank farms age the tanks and their piping become vulnerable to corrosion that can result in sudden and unpredictable failure. The Miko emergency kits are now being held on site by the more responsible tank farm operators who would otherwise have no option other than to watch the escape of thousands of gallons of valuable product.

The Miko Marine pipe repair system

PAINTS & COATINGS:

INTERNATIONAL PAINT:

AkzoNobel’s Marine Coatings business has outlined for the first time its full compliance with ISO 19030, the new standard for measuring hull and propeller performance. The requirements for ISO 19030 have been incorporated into AkzoNobel’s recommendations for hull performance monitoring, which means hull coating performance predictions from AkzoNobel’s big data consultancy tool, Intertrac Vision, can be verified and validated against actual performance using a monitoring process that is ISO 19030 compliant.

The ISO 19030 standard consolidates the latest academic and industry knowledge and understanding into an agreed and standardised method to measure the performance of a vessel through the water. This enables the transparent comparison of datasets and will work towards the elimination of disputes in relation to vessel performance. In conjunction with other industry stakeholders spanning the shipping supply chain, AkzoNobel has played an influential role in the development of all parts of the new ISO 19030 standard.

Michael Hindmarsh, Project Lead for Intertac Vision at AkzoNobel’s Marine Coating’s business, said, “Intertrac Vision is a system that is easily adaptable, scalable and has the capabilities to react to market changes, and it can incorporate more functionality as required to suit the needs of our business and

customers. The adoption of ISO 19030 into Intertrac Vision to measure hull performance is an important example of this, and demonstrates AkzoNobel's ongoing commitment to delivering transparency and choice in hull coating selection and performance."

Intertrac Vision is a pioneering free digital consultancy service for ship owners and operators that provides accurate and transparent predictions on the fuel and CO2 savings potential of fouling control coatings, prior to application. Hull coating performance predictions produced by Intertrac Vision can be analysed during vessel operation to confirm compliance with the requirements for all parts of ISO 19030. This includes ISO 19030 Part 2, which is used by an estimated 10% of the commercial fleet and is based on taking data from sophisticated on-board sensors at high frequency intervals, as well as ISO 19030 Part 3, an area of the standard proposed by AkzoNobel which is founded on a tiered system of potential methods for monitoring, including noon report data collection. AkzoNobel will also continue to support ship owners and operators who wish to verify the performance of their coatings using other methods.

Barry Kidd, ISO 19030 working group member for AkzoNobel's Marine Coatings Business, said, "In line with our belief in providing choice to customers, and in consideration of the tough economic climate, we believe that the new ISO 19030 standard should be made relevant to the widest possible number of ship owners and operators within the industry. Compliance with ISO 19030 Part 2 and Part 3 enables us to achieve this, by enabling the vast majority of the industry to ensure, and demonstrate compliance with the new standard."

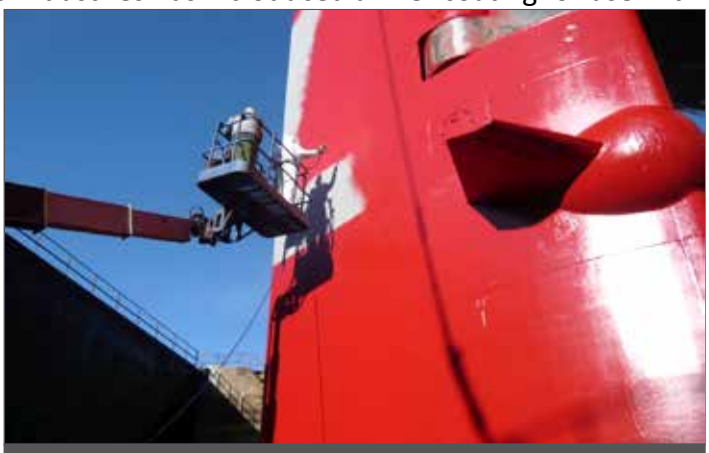
ISO 19030 will be finalised this year marking a solid, initial 'line in the sand' in relation to monitoring hull and propeller performance. AkzoNobel will continue to educate the shipping industry on the principles and value of the standard, while seeking further clarity on its take-up within the market, and the appetite for integration into ship owners' individual in-house analysis systems, as well as the analysis software of performance monitoring companies.

ECOSHIELD:

With an increasing trend for thruster and rudder manufacturers finishing their products with self-cleaning protective hard coatings, Antwerp headquartered Subsea Industries has introduced a filler coating for use with its award-winning Ecoshield hard coat system.

Ecofix, specifically formulated to provide shiprepairers and Original Equipment Manufacturers with a cost-effective solution for the repair of corroded or pitted steel surfaces, returns the thruster or rudder to its original state prior to touching up the repaired area with Ecoshield.

Boud Van Rompay, Executive Director of Subsea Industries, said, "We are seeing an increasing number of propulsion and steering equipment suppliers apply tough hard coatings to their equipment for maximum protection against cavitation and abrasion damage, both of which can lead to widespread corrosion if conventional coatings fail.



Ecoshield being applied

"When a rudder or other piece of underwater gear has not been properly protected, the surface will become corroded. Cavitation damage can cause severe pitting and the steel needs to be restored to its original shape with a smooth surface prior to recoating.

"This is where Ecofix comes in. It has been developed to repair most pitting or corrosion damage on rudders, stabiliser fins, thrusters and other underwater gear. It's as tough as the steel itself," said Van Rompay.

With extraordinary bonding and hardness properties, Ecofix is an effective alternative to metal facing or very expensive fillers. And because it is part of the Ecospeed/Ecoshield family, it is non-toxic and extremely durable.

Since Ecofix uses the same basic resin as Ecoshield, the coating can be applied just one hour after applying the filler. "Ecoshield is the only coating known to fully protect rudders and thrusters from all cavitation damage for the remainder of a vessel's service life. Now with the launch of Ecofix, the repair work needed on the underlying steel can be done effectively and economically," said Van Rompay.

FEATURE:

SHIPPING'S M&R NEEDS AN UPGRADE:

Smart computerised management systems are likely to transform traditional ship maintenance and repair procedures over the next few years. Remote condition monitoring, predictive maintenance and real-time analytics should make the marine repair business far more effective. Parts will be replaced when necessary rather than by routine thereby reducing costs, and major components which are functioning effectively will not be opened up unnecessarily – a frequent contributor to subsequent poor operation or breakdown.

Meanwhile the traditional five-year survey cycle – with an intermediate one thrown in sometime around 30 months – is likely to give way to a more consistent approach to maintenance as part of a ship's normal operation. OEMs are already monitoring the performance of their components on board newer ships and are ready to provide replacements if exceptions are identified in the course of daily operation.

Fuel and torsion meters monitor fuel efficiency and already provide indications on when hulls require cleaning or propellers need a polish. Before long, new technologies will enable airborne and underwater drones to survey ships, inside and out, providing data in real time (or almost real time in the case of internal spaces with no connectivity) so that ship managers ashore and other interested parties including class societies can monitor a ship's condition and adopt an appropriate maintenance strategy.

Although this brave new world is now perfectly possible with huge advances in data processing speeds, high-bandwidth satellite communications and condition monitoring in real time by OEMs, the vast majority of ships are not suitably 'wired up' for computerised maintenance management. Components on board ships more than just a few years old are perhaps not designed to be permanently monitored. Communication between ship and shore still works on a 'needs must' basis, with ship performance clumsily tracked through error-prone noon reports. On assets such as these – of which many thousands of vessels comprise most of the world's fleet – computerised maintenance management is still merely a blip on the horizon.

For the operators of these ships, however, significant improvements in drydock efficiency may be possible, according to a report published this week by Asset Performance Networks which describes itself as 'a turnaround benchmarking and assessment firm' for industry. In its 2015 Dry Docking Performance Benchmarking Study, the firm found that drydocking procedures lag behind similar asset maintenance undertakings in other industries and identifies several aspects of drydocking management which could provide significant efficiency gains and cost savings.

The company has specific turnaround performance experience in the offshore, petroleum, chemical and energy industries and claims to be in a position to provide clients with 'access to the largest database of turnaround metrics in the world'. The firm has worked with shipping and offshore clients including BP, Chevron, Neste, Shell, Statoil and Suncor.

In the benchmarking study, AP Networks analysed the results of drydockings completed in 2015 on a diverse range of ship types operated by ship managers and owners in Southeast Asia and Europe. Participants were asked to give data on preparatory work ahead of dockings, work actually undertaken in the repair yard, and the quality of the results.

Poor cost estimation and target setting, with inadequate preparation and approval of budgets, was found to be a significant weakness, with cost and performance implications for study participants and results in the bottom quartile. According to the firm's analysis, allocating the budget and its formal approval, a key milestone, typically takes place 3.5 weeks before a docking. Participants in the study performed with greater efficiency, averaging a 12-week prior-to-docking figure, but still significantly below 'recommended best practice' of 20 weeks. AP Networks suggests that shipping firms should start planning and preparation earlier, to avoid expensive decision-making and pressure from the yard contractor.

Other points identified by AP Networks in the study included a consistent over-estimation of hull work volumes, poor definition of the right scope for a docking leading to non-competitive schedules, and poor gauging of contingency allowances required for work scope changes. The firm claims to have helped several maritime companies to improve their drydocking performance including Rickmers, Masterbulk and Transocean.

ON WATCH:

• ***GAC Russia*** is expanding eastwards with the opening of new branches at Nakhodka and Yuzhno-Sakhalinsk. This latest development means it is the only ship agent with a presence throughout the interconnected Arctic region and Far East: at Murmansk, Kandalaksha, Sabetta, and now Nakhodka and the capital of the Sakhalin region, Yuzhno-Sakhalinsk. Arkady Podkopaev, GAC Russia's General Manager, says, "GAC has been active in Russia since 2001 and has built a strong network of offices in the European part of the country. The time is now right for us to expand eastwards to provide the GAC brand of professional ship agency and husbandry services to our customers operating in the Far East, which has a coastline of over 5,000 miles and covers 22 maritime ports." As the Russian Federation focuses on developing political and economic relations with the Asia-Pacific region, the country's Far East has moved to the top of the agenda. The region includes a Free Port Zone established in 2015 covering Vladivostok, Nakhodka, Korsakov and several other ports. Close to the borders with China, Japan, and Korea, the area is a hub for trade with imports coming in from Asia, which are transferred to other vessels or the Trans-Siberian Railway, one of the region's key transportation lanes, for distribution to the rest of the vast nation. The Free Port Zone aims to boost trade and shipping activities with tax benefits, single windows for border control, duty free, tax free import/export, and simplified visa procedures. Podkopaev adds, "The region offers a wealth of business opportunities for our integrated services, and those opportunities are set to become even more plentiful as a result of the Free Port Zone." Sakhalin Island is home to Russia's first LNG plant exporting to Asian countries. Most of the export of crude oil in the Far East is arranged from the Kozmino terminal near Nakhodka to where crude is delivered by the Eastern Siberia Pacific Ocean pipeline from the Siberian fields. Most of Sakhalin Island's hydrocarbon resources are located offshore.

• Ross Stevens has been appointed Managing Director of ***Fugro GeoServices Ltd***, the UK based site characterisation specialist. Stevens is a chartered civil engineer who joined Fugro Seacore in 2007 after a decade in project management and civil contracting. In 2012, he was appointed deputy MD of Fugro Engineers BV based in the Netherlands. He returned to Fugro Seacore as a director in 2015, ahead of its integration in October 2015 as part of Fugro GeoServices Ltd. During his time at Fugro, Stevens has developed extensive experience in managing global marine site investigations in oil and gas and the renewables markets. Commenting on the appointment Stevens said, "To be taking on the position of MD is a great honour, especially at a time when Fugro is playing such a key role in site characterisation for the UK's new nuclear programme and high speed rail network and supporting infrastructure projects around Europe". Stevens takes over the reins from Marcus Rampley who has steered Fugro GeoServices through its successful integration of UK-based Fugro specialists, marking an illustrious 37-year career in geotechnics.

• In the latest stage of its national expansion, ***GAC Brazil*** has opened a seventh office to offer its shipping, logistics, bunker fuels and marine logistics at one of the country's newest and rapidly growing port complexes, in the north of Rio de Janeiro State. The new office, which officially opened this week at São João da Barra RJ, covers operations at the Açu port complex. Located 315 kms north of Rio de Janeiro city, Açu has ten berths, with plans to add another 20, and at 21 m, is deep enough to accommodate some of the world's largest freight vessels. "The Açu Port is expected to become one of the largest port complexes in Latin America. The combination of commodities and activities related to shipping and logistics is definitely a great opportunity for GAC Brazil to showcase its main assets to the local market. Having this scenario, we can assure our customers that GAC is a reliable option as our shipping team has a distinctive blend of dry bulk and O&G specialists," says Rodrigo Kill, Shipping Manager at GAC Brazil. Jorge Nikulin, Project Manager for GAC Brazil Logistics, adds, "For project logistics, Port Açu is a bright place for development, combining strategic localisation with opportunities for growth. GAC Brazil is gathering synergy through its services to offer a complete solution to our customers backed by ship agency, project logistics and our full package of logistic solutions."