

# mem

MARINE ENGINEERS MESSENGER

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## NEWS IN THIS EDITION:

Wartsila fixes sfoc figures; Polar Code Warning; Graphene Development; New Scrubber Notation; LNG Fuel Testing; Dynamic Positioning; Bridge Systems; Electrical Systems; Marine Engines; Gas Turbines; Refrigeration; Ballast Update

## FEATURE ARTICLE:

A new spin on the Flettner Rotor

Photo: A rare sight these days: engineers in the engineroom

Copyright: Joe Gough

## Telegraph

**W**ärtsilä's transparency in publicly disclosing that the fuel consumption figures of 200 four stroke marine engines have been doctored will go some way in restoring confidence with stakeholders, but suggestion that the financial impact is negligible is unlikely to be a view shared by the shipowners operating these engines.

During a telephone press conference, members of the Wärtsilä Board explained that an internal audit of Factory Acceptance Test procedures revealed fuel consumption discrepancies on a number of marine engines coming out of the enginebuilders Trieste factory.

Fuel consumption figures are alleged to have been deliberately manipulated over the course of several years by a "limited number of personnel" looking to make shortcuts to the lengthy Factory Acceptance Test procedure. However, while Wärtsilä emphasised that safety and quality had not in any way been compromised and emission levels were unaffected by the discrepancy, it believes the "customer impact is marginal" and the "financial impact is estimated to be immaterial".

Depending on ship size and cruising speeds, an 8000TEU containership could burn about 150t of bunker fuel a day. Now, if we say that a vessel is operational for 250 days of the year (assuming there are no lay-ups or other macro-economic factors to consider) then fuel consumption would be 37,500t per annum and at a current average bunker price of US\$165t, then that's about \$6M shipowners have to fork out just to get one ship moving. And if you consume one per cent more fuel than anticipated then up it goes by sixty grand. Serious money. Now times that by the 200 marine engines that Wärtsilä has admitted to delivering with a 1% fuel consumption discrepancy, then shipowners with these engines could have spent an additional \$12 million on bunker fuel they hadn't budgeted for.

While increased fuel consumption relates to the load other ship consumers place on the engine, to say that a 1% fuel consumption increase is immaterial will do little to appease those customers already losing trust in manufacturers' claims following the VW debacle.



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**SEABORNE COMMUNICATIONS**

## WÄRTSILÄ ADMITS TO FIXING FUEL FIGURES

Wärtsilä has revealed that fuel consumption test results for some of its marine four-stroke engines are spurious.

The extraordinary announcement, made in a press statement released last Monday, follows an internal investigation of fuel consumption measurement tests conducted for marine engines delivered from the Wärtsilä Delivery Centre, in Trieste, Italy. It was discovered that fuel consumption figures had been manipulated by an average of 1% and may affect 2% of all Wärtsilä marine engine deliveries, disclosed the enginebuilder.

“Based on our current analysis, the deviations have been caused by a limited number of personnel, who have clearly acted against work instructions and our code of conduct by influencing the test results.

These actions are in dire violation of corporate policies and the company takes the matter extremely seriously. In order to secure new and transparent processes and controls, Wärtsilä has reviewed all test procedures, and taken immediate corrective actions where deviations have been found. Consequently, we can confirm that the tests fulfil our high standards,” the company said in the statement.

Jaakko Eskola, President and CEO Wärtsilä Corporation, said: “Wärtsilä requires all its employees to act in accordance with internal guidelines as well as laws and regulations. We deeply apologise for any loss in trust caused by this violation to our policies and corporate values, and we will immediately start reaching out to our customers.”

It is to be noted that the engines in question have fulfilled the regulatory and classification society requirements, and the potentially affected vessels have met sea trial requirements. According to Wärtsilä, the customer impact of the deviations is marginal.

In 2015 Wärtsilä’s marine engine sales represented 12% of annual group revenues. According to the estimate of Wärtsilä management, the financial impact of this issue is not material.



## VOLVO PENTA POWER FOR PRINCE OF WHALES

Four Volvo Penta D13-700 inboard turbo diesel engines, each of which has an output of 700HP at 2300rev/min, have been selected to power a new custom-built whale watcher operated by the Prince of Whales.

The new vessel, *Salish Sea Dream*, will also be fitted out with Volvo Penta engine monitoring and throttle controls. Pacific Power Group (PPG) will supply the equipment to the Gregory C. Marshall- designed 24m long, 94 passenger-capacity vessel, which is due to be delivered by Armstrong Marine in May.

Offering low weight & fuel consumption, lower operating costs, the low emission engines are certified to US EPA Tier 3 commercial marine and IMO II standards. Further environmental benefits are achieved with a longer

Type Approved  
to IMO MEPC  
227 (64)

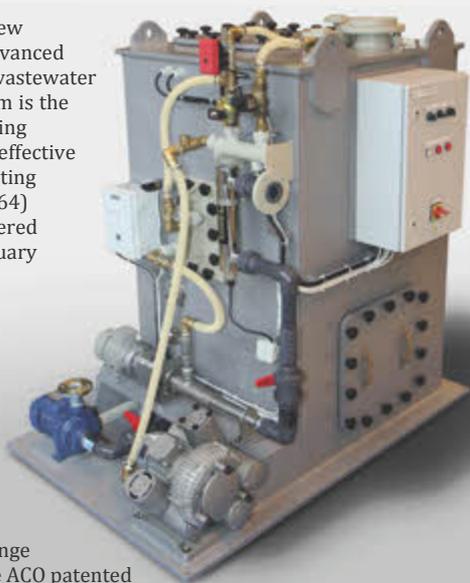


# Priceless

## CLARIMAR MF

ACO Marine's new Clarimar MF advanced black and grey wastewater treatment system is the merchant shipping industry's most effective solution for meeting IMO MEPC 227(64) rules, which entered into force in January 2016.

Small and economical with the lowest running costs of any sewage treatment plant, the Clarimar MF range incorporates the ACO patented 'Bio-Sword' technology.



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engine oil change interval of 1000h, reducing oil usage and waste oil management.

"The Volvo Penta commercial marine engine line has expanded our ability to meet the needs of the commercial market," said Bill Mossey, Vice President, PPG. "With Volvo Penta D13 engines powering the *Salish Sea Dream*, Prince of Whales will see more uptime and greater reliability that will increase the profitability of their operations."

## ROLLS-ROYCE TO SUPPLY TURKEY'S LARGEST SUPERYACHT

MTU Turkey has signed a contract with Istanbul-based Bilgin Yachts for the supply of six MTU 16V 4000 engines. These will be deployed to power two 47.6m Bilgin 156 motor yachts, as well as the largest yacht ever built in Turkey in its class – the *Bilgin 263*.

Bilgin Yachts recently won the construction order for the 80.1m superyacht from a long-standing customer. It will be powered by twin MTU 16V 4000 M63R engines.

Bilgin has also decided to embark on the construction of two 47.6m motor yachts – each of which will be powered by an MTU 12V 2000 M72 unit.

## GAS TURBINES

### JIP UNDERWAY TO REDUCE GAS TURBINE EXPLOSION RISK

A joint industry Project (JIP) is underway to investigate how best to reduce the potential explosion and fire risks from hydrocarbon leaks in gas turbines, announced Lloyd's Register earlier this month.

Companies and universities across the world are collaborating in an initiative to improve awareness on how to optimise safety design of gas turbines used in offshore facilities processing combustible fluids, helping operators achieve greater safety, integrity and risk management.

In the long term, the JIP could help save the industry billions of dollars in costly downtime, possible injury claims and damage to the environment.

"Ignition of hydrocarbon leaks in gas turbines is a critical issue for oil and gas operators," says Ingar Fossan from LR's consulting business. "Findings from this JIP will lead to safer design of new installations, reduction in risk of future incidents on existing infrastructure, leading to tangible cost reduction."

Offshore installations contain dedicated turbine and power generation facilities that produce energy to run the installation's various processes. The turbine enclosures and generator rooms are high risk areas because of the combination of very high temperatures, moving parts, fuel and lubricants.

Fossan said: "The JIP brings together technical and operational expertise on gas turbines to collaborate on data gathering and advanced modelling of potential accidental scenarios. Considering the complexity of the various operating scenarios and differences in how gas turbine machinery are designed and manufac-

tured, the JIP starts with an initial assessment and agreement with JIP partners on the primary issues and areas of investigation.”

The JIP is expected to attract interest from gas turbine manufacturers, research institutes to gas turbine owners and infrastructure operators. JIP partners include ConocoPhillips Skandinavia, Maersk Oil and Gas and Statoil. Academic partners include Nanyang Technological University and University of Twente along with our Global Technology Centre in Singapore which is financing and supervising a PhD study tied to the project. General Electric O&G is supporting the project with data on design and operation of gas turbines.

## EXHAUST TREATMENT

### **DNV GL IS SCRUBBER-READY**

DNV GL has introduced a new class notation to help shipowners prepare newbuildings for the installation of a marine exhaust scrubber. Designated SCRUBBER READY, the new notation ensures that the necessary preparations are in place for a smooth and cost-efficient scrubber retrofit at a later stage.

“There is no doubt that stricter emissions regulations for sulphur oxides are here to stay,” said Knut Ørbeck-Nilssen, CEO at DNV GL – Maritime. “This new SCRUBBER READY class notation gives shipowners the flexibility to minimise their initial investment when ordering a newbuilding, while at the same time having the confidence that their vessels are already on the track to easy compliance with incoming emissions regulations.”

Hans Jacob Horgen, the DNV GL engineer responsible for exhaust gas cleaning rules, said: “Ship managers have to factor in many considerations when planning for a potential future scrubber installation, from space and stability requirements, to fire safety, piping, corrosion resistance, and the effect on the main engine.

“It is very important to have an overview of the design and an understanding of how the system will interact with the engines and auxiliary parts of the machinery system. We also offer scrubber advisory services to support our customers, from building the business case, to risk assessment of the design, installation, commissioning, hardware-in-the-loop testing of the control system, right through to the system entering into operation.”

Part of the new DNV GL rules for classification, the SCRUBBER READY notation can be awarded to ships that have planned and partly prepared for the installation of an exhaust gas cleaning system (EGCS) for the removal of SO<sub>x</sub> at a later date.

The notation identifies the general type and category of scrubber systems than can be installed on the vessel. It also details the level of scrubber readiness, with the minimum scope attesting that the space available and future installation arrangement meets class and statutory requirements. This can be expanded to include more extensive preparations, through to a complete review of the scrubber documentation according to main class rules, including the certification and installation of piping and sub-systems. For shipyards, working with the SCRUBBER READY standard gives an easy framework within which to offer future-ready ship designs to the market.

## LNG FUEL

### **ALFA LAVAL TEST CENTRE EXPANDS WITH LNG FACILITY**

The Alfa Laval Test & Training Centre in Aalborg, Denmark is to be expanded with a dedicated LNG and alternative fuels faculty to create the world’s most advanced test centre for environmental and combustion technology.

Opened nearly two years ago, the Alfa Laval Test & Training Centre is a cornerstone of customer-focused technology development. It is already a massive facility, boasting a 250m<sup>2</sup> testing space where a 2MW diesel engine and equipment from all of Alfa Laval’s marine product groups create the closest possible simulation of a full-sized commercial vessel.

Now it will be expanded with an additional 1100m<sup>2</sup>, dedicated to environmental and combustion technology in burners and heating systems for vessels using LNG and other alternative marine fuels. The wider operations are expected to begin at the end of the year.

“LNG and other fuel alternatives will play a key role in meeting the marine industry’s environmental and energy challenges,” says Peter Leifland, head of Alfa Laval’s Marine & Diesel Division. “Through the expansion of the Alfa Laval Test & Training Centre, we will support this shift with cutting-edge technology development.”

It is expected that 7000 vessels will be sailing with LNG in 15 years, compared to the 500 vessel currently operating on the clean fuel.

## DYNAMIC POSITIONING

### **BRAEMAR INTRODUCES PAPERLESS DP TRIALS**

Braemar Engineering has introduced a new initiative capable of shaving up to 35% off the cost of carrying out annual dynamic positioning (DP) trials.

“Traditionally these trials are carried out using paper based systems which are time consuming to prepare and complete,” says Kyle Eddings, Global Manager for DP and Offshore Projects at Braemar Engineering. “This

new system allows crew and surveyors to use the latest tablet technology to control, record and analyse data in real time, increasing efficiency, and resulting in cost savings for the customer.”

Braemar says the system, which uses high powered Microsoft tablet, can cut-out up to three days of post trials reporting by simply delivering the document offshore rather than having the client incur additional costs and delay waiting for the surveyor to return to shore and prepare the report.

Eddings says: “We ran a successful trial of the system last year, and have now rolled it out to all areas of our DP surveying business. There is substantial pressure on owners and operators in the offshore sector to look at ways of reducing costs. This new system means that significant savings can be made without cutting corners, ensuring safety and quality come first.”

The new system uses high powered Microsoft tablet computers in all stages of the survey process, from preparation to the survey itself. The crew supports the surveyor during trials and results are then delivered instantly on site, avoiding the lengthy write up process that is traditionally carried out afterwards. Not only does this save time, but also allows any necessary actions to be flagged up immediately and any remedial action to be taken if required.

## BRIDGE SYSTEMS

### **STOKER AND BESANT DELIVERED WITH ALPHABRIDGE**

*Stoker*, the 93m rescue gear ship (RGS) and the 83m escape gear ship (EGS) *Besant* delivered from Damen Shipyards’ Vietnam yard last week both feature the multi-function, fully integrated AlphaBridge system from Alpatron Marine.

The vessels, built for Serco Defence to support the Royal Australian Navy (RAN), will be used to provide an early intervention role in the event of a disabled submarine. Both ships will be based at Fleet Base West, Rockingham, West Australia.

Bridge design has become increasingly important over the years, given the constant growing complexity of maritime technology. Working closely with Damen, a full 3D proposal of the ships’ bridge layout was created, something which has become a standard at the start of all new projects.

“We delivered a comprehensive bridge which was tailored to the customers wishes,” said Alpatron in press statement. “Damen was impressed at this early stage design, realising the strength of the AlphaBridge, offering intuitive, comfortable operation of all navigation, dynamic positioning, control and communications systems that contribute to safe passage. The best possible configurations were selected, keeping it solid and stable, without compromising on an overall sleek and ergonomic design.”

## ELECTRICAL SYSTEMS

### **BAKKER SLIEDRECHT SUPPLIES BIBBY’S FIRST PURPOSE-BUILT SOV**

Bakker Sliedrecht has secured a contract to supply and integrate all main electrical installations aboard *Bibby WaveMaster 1*, a 90m service operations vessel (SOV) under construction by Damen Shipyards Group for Bibby Marine Services.



When delivered from the Damen Galati shipyard in Romania, it will be Bibby Marine's first vessel purpose-built for the transfer and accommodation of offshore personnel to wind farms being constructed deep offshore.

Bakker Sliedrecht's scope of supply includes all main electrical installations, including the design, fabrication, installation and commissioning of the main switchboard, two auxiliary switchboards and three drive systems. All drive systems will be equipped with an active filter that saves space on board and creates a clean power supply by eliminating harmonic distortion.

Bakker Sliedrecht will also take care of the design and installation of the complete cabling on board the SOV.

*Bibby WaveMaster 1* represents the first collaboration of its kind between the Damen Shipyards Group and Bibby line Group. Its Bibby Marine Services division aims to provide total access and accommodation solutions for the offshore wind farm sector.

Stephen Blaikie, Chief Executive Officer, Bibby Marine Services, said: "*Bibby WaveMaster 1* is a custom-designed 90m SOV, with walk to work access and 60 high quality accommodation berths. The aim is to enable offshore wind operators to work more efficiently, more safely and in maximum comfort, for periods of up to 30 days at a time.

"The vessel is built on a stable DP-2 (Dynamic Positioning) platform so it offers very high operability. It will provide safe offshore transfers for personnel by way of a motion compensated access system (Walk to Work). Equipment will be securely transferred by way of the heave compensated offshore-rated knuckle boom crane. With technicians on standby in the field 24/7, wind farm operators can act immediately to rectify expensive outages, even in the toughest of weather conditions."

Working efficiency is also one of the key drivers behind the innovative vessel design. The space has been carefully planned in terms of storage, workflow and logistics to ensure that the movement of both people and goods is smartly optimised.

The vessel has been specifically designed to be as 'green' as possible, with minimal emissions and low fuel consumption.

Whilst both safety and efficiency are integral features, comfort is also paramount. The Comfort Class 2 standard accommodation comprises 60 individual en-suite berths, all of which are equipped with TV and Wi-Fi, and are complemented by class-leading leisure facilities.

As well as offering a high standard of living, the vessel hull form has been designed with comfort in mind, ensuring exceptional sea keeping abilities, and minimising motion sickness to ensure technicians are fit for work.

## REFRIGERATION

### COFELY BOXES MACHINERY SPACE COOLING

Cofely Refrigeration has developed its Quantum G chiller series as a container solution to meet market demand for a space-saving cooling system that is already assembled and only needs to be connected.

As a container solution, the development combines the advantages of the container design with the sustainable cooling generation of the Quantum G. The container solution is pre-mounted on a base frame so that it can be quickly adjusted to the conditions on site. Thus, the cooling system is not stationary and can be used at a different location if required. The container can also be implemented as a machine room to provide the integrated chiller components with effective protection against aggressive environmental factors.

Cofely Refrigeration delivers the container completely wired and tubed. When it has been connected to the mains supply and the cold water network, the cooling system is immediately ready for operation. With its integrated safety equipment, such as a gas warning system and emergency exit markings, the container already fulfils many safety regulations as standard.

"With the Quantum G in a container, we are taking our green cooling technology one step further. Now we are offering those customers who use green cooling a really comprehensive carefree package. Thanks to the containers, building permits and static testing are only required in exceptional cases. And as the leak test as per the F-Gas Regulation is also not required, the customer saves a lot of time and effort," explains Jochen Horning, CEO of Cofely Refrigeration.

The Lindau-based company has been providing the Quantum G chiller series since autumn 2014. This series uses refrigerant R1234ze, which has a Global Warming Potential of less than one, meaning the system is not subject to a leak test as per the F-Gas Regulation (517/2014).

## BEARINGS

### THORDON'S COMPAC NOMINATED FOR MAJOR ENGINEERING AWARD

Thordon Bearing's revolutionary COMPAC seawater-lubricated propeller shaft bearing system, has been nominated in the Auxiliary Machinery category of the European Marine Engineering Awards, which will take place in Amsterdam next month.

Craig Carter, Thordon Bearings' Head of Marketing and Customer Service, said: "We are absolutely delighted that COMPAC has been nominated for such a prestigious award. Being nominated for an engineering award is testament to the advances our engineers and scientists have made in polymer technology.

"The polymer we use in our COMPAC system is quite different from other material technology opted for in seawater-lubricated bearing systems," added Carter. "Other bearing materials tend to have a life span of between five and seven years before they need replacing, but our engineers have produced a polymer allowing us to offer a guaranteed bearing wear-life of 15 years. And current vessels using COMPAC are seeing even longer wear life."

George Morrison, Thordon Bearings' Regional Manager West Europe and Africa, said: "To be nominated for this award soon after winning the Tanker Shipping & Trade Environment Award last November is a remarkable achievement and illustrates the confidence that the market has in this technology."

Last year Thordon Bearings' COMPAC seawater lubricated propeller shaft bearing systems were ordered for a number of significant commercial vessels. These included the two largest Jones Act containerships to be built, the 3600TEU vessels for Matson Navigation; the 38700dwt 'Green Dolphin' bulk carrier Revelin for Atlantska Plovidba; and JT Cement's Greenland, the world's first ever LNG-fuelled dry bulk ship.

Other nominees for Riviera Maritime Media's European Marine Engineering Awards include ABB's Azipod D and Wärtsilä's Sternguard Seal. Nominees had to demonstrate a technological development that improves a vessel's operational efficiency or reduces risk to personnel.

## POLAR CODE

### SOME CRUISESHIPS MAY NOT BE READY FOR THE POLES, SAYS FORESHIP



Some cruiseships and marine equipment may not satisfy Polar Code requirements and be unable to cope with the extreme temperatures encountered in the Arctic and Antarctic regions.

The International Code for Ships Operating in Polar Waters is expected to enter into force in January 2017 for ships built after that date, but Markus Aarnio, chairman of Finnish naval architect and marine engineering firm Foreship, says few cruiseships are strengthened for ice and those that are have been strengthened only to the lowest possible ice class.

"New Polar Code requirements for ships include a defined Polar Service Temperature, based on actual temperatures in the intended operational area. Stability considerations need to include ice accretion, which is not always easy in the case of older ships with small stability margins."

In a press statement, Aarnio says goal-based concept design can help ensure new generation exploration ships and their deck machinery – winches, lifeboat davits and fire-fighting equipment etc – can operate safely in low temperatures.

"Arctic and Antarctic waters have a number of similarities, but there are also significant differences," he

observes. “There is relatively little multi-year ice in the Antarctic, while Arctic sea ice survives over many summer seasons. This will affect the required ice strengthening, even if most Polar Code cruise ships plan to operate mostly in open water.

“Separated engine rooms, modern waste water treatment, adequate garbage stores and the possibility to operate without heavy fuel oil are all prerequisites for polar operations,” adds Aarnio. “But owners also need to consider ship sizes and passenger capacity; ships with more than 500 passengers cannot land passengers on Antarctic, for example, and more regulations are coming to protect sensitive polar areas.”

Foreship is involved in two landmark polar passenger ship contracts, one for Crystal Cruises, another for Scenic. These will be the first luxury passenger vessels that are purpose-built for waters previously served by robust but ageing expedition ships.

## **BALLAST WATER**

### **ONE STEP CLOSER**

Belgium has become the latest country to ratify the Ballast Water Management Convention, bringing the treaty within sight of meeting entry into force criteria.

The BWM Convention will enter into force 12 months after ratification by 30 States, representing 35% of world merchant shipping tonnage. With the accession by Belgium, the number of States stands at 48, with an aggregate of 34.82% of the world’s merchant fleet tonnage.

Belgium also deposited its instrument of accession to the Hong Kong Ship Recycling Convention, bringing the number of contracting States to four.

IMO Secretary-General Kitack Lim encouraged other States that had not already done so, to ratify both the BWM and Hong Kong treaties, in order to bring them into force.

At the time of writing, Fiji became the 49th IMO member state to ratify the agreement, although this would not change the tonnage due to the island state registering zero tonnage.

## **NEW TECHNOLOGY**

### **GRAPHENE CAN NOW ABSORB LIGHT!**

Using a technique known as nano-texturing, researchers from the University of Surrey’s Advanced Technology Institute have created ultra-thin graphene sheets designed to more effectively capture light. Just one atom thick, graphene is very strong but traditionally inefficient at light absorption. To combat this, the team used the nano-patterning to localise light into the narrow spaces between the textured surface, enhancing the amount of light absorbed by the material by about 90%.

Professor Ravi Silva, Head of the Advanced Technology Institute said: “Solar cells coated with this material would be able to harvest very dim light. Installed indoors, as part of future ‘smart wallpaper’ or ‘smart windows’, this material could generate electricity from waste light or heat, powering a numerous array of smart applications. New types of sensors and energy harvesters connected through the Internet of Things would also benefit from this type of coating.

“The next step is to incorporate this material in a variety of existing and emerging technologies. We are very excited about the potential to exploit this material in existing optical devices for performance enhancement, whilst looking towards new applications.”

The Institute is looking for industry partners to exploit this technology and is keen to hear from companies who we can explore future applications of this technology.

## **FEATURE ARTICLE**

### **NEW SPIN ON THE FLETTNER ROTOR**

By Samantha Fisk

With pressure on for shipowners to make cost savings and tighter environmental regulations coming in to play, Norsepower launched its revamped Rotor Sail design on to the market in 2014. Seatrials have shown the Rotor Sail can result in energy savings of 10-20%, the company claims.

The Norsepower Rotor Sail solution uses latest technology, advanced materials and a high-tech control system to maximise cargo ship fuel efficiency. Tuomas Riski, CEO, Norsepower explains: “When the wind conditions are favourable, Norsepower Rotor Sails allow the main engines to be throttled back, saving fuel and reducing emissions while providing the power needed to maintain speed and voyage time.”

In comparison to the Flettner rotor, on which the Rotor Sail technology is based, it has been completely updated and re-engineered using the best currently known materials, such as advanced fibre composites, and control systems. The Rotor Sail operates on the principle of the Magnus effect. When wind meets with the spinning rotor, the rotor sail accelerates airflow on one side of the rotor sail and restricts the airflow on the opposite side of the rotor sail. The resulting pressure difference creates a lift force on the sail.

The company highlights that the Magnus effect-based solution has the potential to be 10 times more efficient than a conventional sail because more lift is produced with a much smaller sail area.

“Norsepower Rotor Sail is the most fast-spinning and lightest Flettner rotor, which has ever been built. It requires a lot less energy to be rotated and causes less noise and vibrations than any of the earlier Flettner rotor designs,” Riski adds.

Norsepower Rotor Sails are available in three sizes with different sail heights of 18, 24 or 30m. The sails are installed on the deck of the vessel with vessel-tailored foundations, which are installed during a yard stay. The rotors are installed on the foundations with a bolt connection. Adding to this the operation of the sails can be conducted by crew from the bridge through the Norsepower control panel.

According to the first test results, obtained in 2014, the Norsepower Rotor Sail consumes less than 10% of energy for the forward thrust it generates compared to the energy required for generating the same forward thrust by conventional means. As a result, the solution offers a 90% decrease in greenhouse gas emissions and air pollution compared to the propulsion power, which is produced with the best currently available propulsion technology.

First sea trials of the Rotor Sail took place onboard the 9,700dwt vessel *Estraden* owned by Finland-based Bore, which initially gave good results. Further sea trails were conducted in 2015, which have been verified by NAPA and VTT Technical Research Centre, which confirmed fuel saving of 2.6% using a single small Rotor Sail.

“The results suggest that when Norsepower’s technology is implemented at scale, it can produce up to 20% net savings in fuel costs with a payback period of less than four years at current fuel prices, confirming that wind technologies are commercially-viable solutions that reduce fuel and carbon emissions in the industry,” explains Riski.

The trials were measured and analysed with continuous monitoring systems from maritime data analysis, software and services provider, NAPA and VTT Technical Research Centre of Finland. VTT Technical Research Centre of Finland collected data over a six-month period, during which both the Rotor Sail technology and automation system was operational 99% of the time. The results confirmed that Norsepower’s rotor is able to produce large amounts of thrust force, which enables considerable fuel savings.

The Norsepower Rotor Sail has been mainly designed for tankers, bulk carriers, ro-ros, and passenger vessels. “There are more than 20,000 vessels worldwide that could be fitted with the Norsepower Rotor Sail Solution,” says Riski. Further to the installation of Bore’s vessel *Estraden*, the company has ordered another Rotor Sail, which has been fitted to the vessel; in expectation that it will double the vessels fuel savings.



## RICKABY STEPS DOWN

Zäl Rustom has been appointed Managing Director of Braemar Howells, succeeding Simon Rickaby who, after 30 years at the helm, steps back from day-to-day executive duties.

Mr Rustom, who brings a wealth of experience in incident response, having worked in the international oil and gas and transport sectors for 30 years, assume full management responsibility for Braemar Howells.

Lord Rickaby has agreed to become non-executive Chairman of Braemar Howells.

James Kidwell, Chief Executive of Braemar Shipping Services PLC, commented: "I am delighted that Zäl has agreed to join and lead Braemar Howells in a new era for the company. It is also especially pleasing that Simon's knowledge and experience will continue to be available to the company and that he will remain involved in support of Zäl and his leadership team. I would like to take this opportunity of thanking Simon for his valuable contributions over the last 30 years."

## CARGOTEC COMPLETES INTERSCHALT ACQUISITION

Cargotec has completed the acquisition of Interschalt maritime systems after receiving regulatory approvals. The acquisition is to strengthen Cargotec and its business areas' Kalmar's and MacGregor's software strategy and complements Cargotec's strategic aim to be the leader in intelligent cargo handling.

Cargotec will consolidate the results of Interschalt software business into Kalmar business area results and the results of Interschalt services business into MacGregor business area results as of March 2016.

## A NEW FORCE IN THE UAE

In partnership with Al Yaseah Group, FORCE Technology has set up a subsidiary company in Abu Dhabi. FORCE Technology Middle East will provide sub-sea inspection and integrity management service to the Arabian Gulf's oil and gas sector.

"Over the past years, FORCE Technology has carried out a number of projects in the region and thereby built a strong relationship with a number of the leading oil and gas companies. By establishing ourselves in Abu Dhabi we demonstrate our commitment to the region and hopefully we can contribute to lowering the operation costs in the oil and gas sector by providing Innovative Technology for inspection and maintenance," said Ernst Tiedemann, President and CEO of FORCE Technology.

## CLASS MOVES

Current Executive Vice President Koichi Fujiwara has been appointed as Chairman and President as well as a Representative Director of classification society ClassNK, effective 7 March 2016.

Current Executive Vice Presidents Yasushi Nakamura and Tetsuya Kinoshita will continue in their present roles on the team, joined by Junichiro Iida as Managing Director.

Noboru Ueda has stepped down as Representative Director, Chairman and President. Current Executive Vice President Tetsushi Agata has been appointed as an Executive Auditor as part of the Society's aim to strengthen its auditing system.

Mr Fujiwara said: "Following the recent downturn of the shipping and shipbuilding markets, the business environment surrounding ClassNK has become even more challenging. Under our new executive team, we will work to ensure stable operations and further enhance our corporate governance as required of an independent third-party organization so that the Society can continue contributing to the development of the maritime industry in the long term."

He joined ClassNK in 2007, and was appointed to Managing Director in 2010, followed by Executive Vice President in 2011. He has so far commanded the expansion and development of the Society's certification services.



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