

mem

MARINE ENGINEERS MESSENGER

mem Issue 3
28 March 2016

PHOTO:
Marine engineers retrofitting an MaK M43 C engine to the product chemical tanker *Fure West*

NEWS IN THIS EDITION:
The return of the turbine
10,000th HiMSEN delivered
G50ME-C9 passes TATs
Siemens gives battery power a boost
Catalyst fines test gives quick results
Power from urine
TTS turns 50

FEATURE ARTICLE:
MARIN upgrades for the modern
maritime world

MEM

MARINE ENGINEERS MESSENGER

Telegraph

Shipping companies need to be more innovative and embrace new technologies, Esben Poulsson said last week at the CMA Shipping conference.

With emphasis on the word 'tomorrow' and how the word should force the industry to think about future advances, particularly in marine technology, the President of the Singapore Shipping Association and Vice Chairman of the International Chamber of Shipping considered how robots and drones could assist with work in dangerous environments including extreme temperatures or with toxic chemicals. He envisioned a future in which 'Big Data' will play an increasingly important role, with the live streaming of data between sea and shore becoming the norm in the near future.

Poulsson's comments coincided with the release of a Rolls-Royce produced video showing how tomorrow's ships will be controlled from shore based control centres using Big Data, drones, holograms, voice recognition software, smart screens and all sorts of technical wizardry. It's all very impressive stuff and completely feasible given that much of the technology is already available or in development. But the pace of change is quite startling and while nothing does or can remain the same, could the pace of progress be too fast for some of us old salts to get our heads around?

Certainly the Generation X-types born between 1966 and 1976 will find the speed with which technology is changing quite bewildering. For someone like me who considered the 40 years it took to move from vinyl to CD as a rapid, though not especially welcome, development, today's accelerated technological advancement makes Luddites of us all. The minute I understand how to use my smart phone in comes an automatic update that changes it all, leaving me searching online for the instruction manual (which always assumes I have a Doctorate in JavaScript - whatever that is). And to this day, I am still unable to change channels on the 550ft widescreen digital HD 3D SMART TV/Coffee Maker we didn't need without teenage assistance. But I was born with an analogue brain that functions in a digital world, so it's inevitable I struggle to keep up.

For the Y and Z Generation born into this digital world, though, getting to grips with all of this hi-tech stuff is easy, elementary, exciting. What's more, the technological developments taking place will make shipping sexy again, attracting the much needed digitally-aware, techno-savvy talent to the industry in the same way that they're attracted to the aerospace or automotive sectors. As Poulsson said in his presentation: in order to secure a bright future for the shipping industry and to implement these exciting possibilities, it is important to attract new blood in the form of the next generation.

The Rolls-Royce 'oX' concept and other developments taking place might just be the thing the industry needs to attract the young and resign old Ned Ludd to history once and for all.



Effective communication keeps your business afloat in a turbulent maritime environment

Don't let modesty close the door on a sales opportunity. Let **SEABORNE COMMUNICATIONS** open doors with an effective media and communications strategy that is proven to generate results. We make sure your stories are heard throughout the global shipping industry, from Asia to the Americas.

W: www.seabornecomms.com
E: enquiries@seabornecomms.com
M: +44 (0)7984919345

SEABORNE COMMUNICATIONS

GAS TURBINES

COGES THE OPTIMUM CONFIGURATION FOR CRUISESHIPS

The introduction of more stringent emissions regulations has brought the marine gas turbine back into the spotlight, GE said last week.

Despite the current low price of heavy fuel oil, the US-based engineering giant believes a combined gas turbine electric and steam (COGES) configuration is the optimum solution for cruiseships looking to comply with IMO Tier III and United States EPA Tier 4 requirements.

Capable of operating on various fuels including LNG, MGO, biodiesel, bio-synthetic paraffinic kerosene blends and natural gas, a COGES arrangement does produce fewer emissions than a conventional diesel engine and negates the need for investment in an exhaust gas treatment system.

What's more, the smaller footprint of a COGES-powered ship can free up space for more cargo and passengers but whether this extra revenue can offset the high capital expenditure of a gas turbine system remains to be seen, said GE.

Certainly, the emergence of LNG as fuel for use in dual-fuel engines will have a bearing on the gas turbine market, but the gas turbine's power, reliability and environmental advantages have always found favour in the cruise segment. That a growing number of cruise vessels are entering the later stages of their operational life, some older ships could be updated with the technology making them safer, more efficient, more reliable and cleaner.

Currently GE has gas turbine installations aboard 17 cruise ships, including the two 30MW behemoths aboard the *Queen Mary 2*.

For similar reasons, a gas turbine installation will remain the prime mover of choice for top military brass, with the Italian Navy being the latest to select the technology as part of its fleet renewal programme. Earlier this month, GE's Marine Solutions announced it will provide LM2500+G4 gas turbines to the Italian Navy's new Pattugliatori Polivalenti d'Altura (PPA) multi-purpose offshore patrol ships under construction at Fincantieri's integrated Riva Trigoso and Muggiano shipyard.

Rolls-Royce, meanwhile, has been selected to provide its MT30 gas turbines to power a prestigious new multi-purpose amphibious vessel for the Italian Navy. Two MT30 gas turbines will power the 20,000t displ Landing Helicopter Deck (LHD) amphibious vessel, also being built by Fincantieri under a major investment programme to renew the Italian naval fleet.

In December the two MT30 gas turbines aboard the first Queen Elizabeth-class aircraft carrier were 'flashed up', marking a significant part of the ship's commissioning programme. The generator giants each provide 36MW of power to the 65,000t ship in a combined diesel-electric and gas turbine (CODLAG) arrangement.

Other naval vessels to have opted for Rolls-Royce gas turbines include the Type 26 Global Combat Ship, and the Republic of Korea Navy's new FFX-II Incheon class frigates. It already powers the US Navy's DDG-1000 Zumwalt class destroyers and Freedom class Littoral Combat Ships.

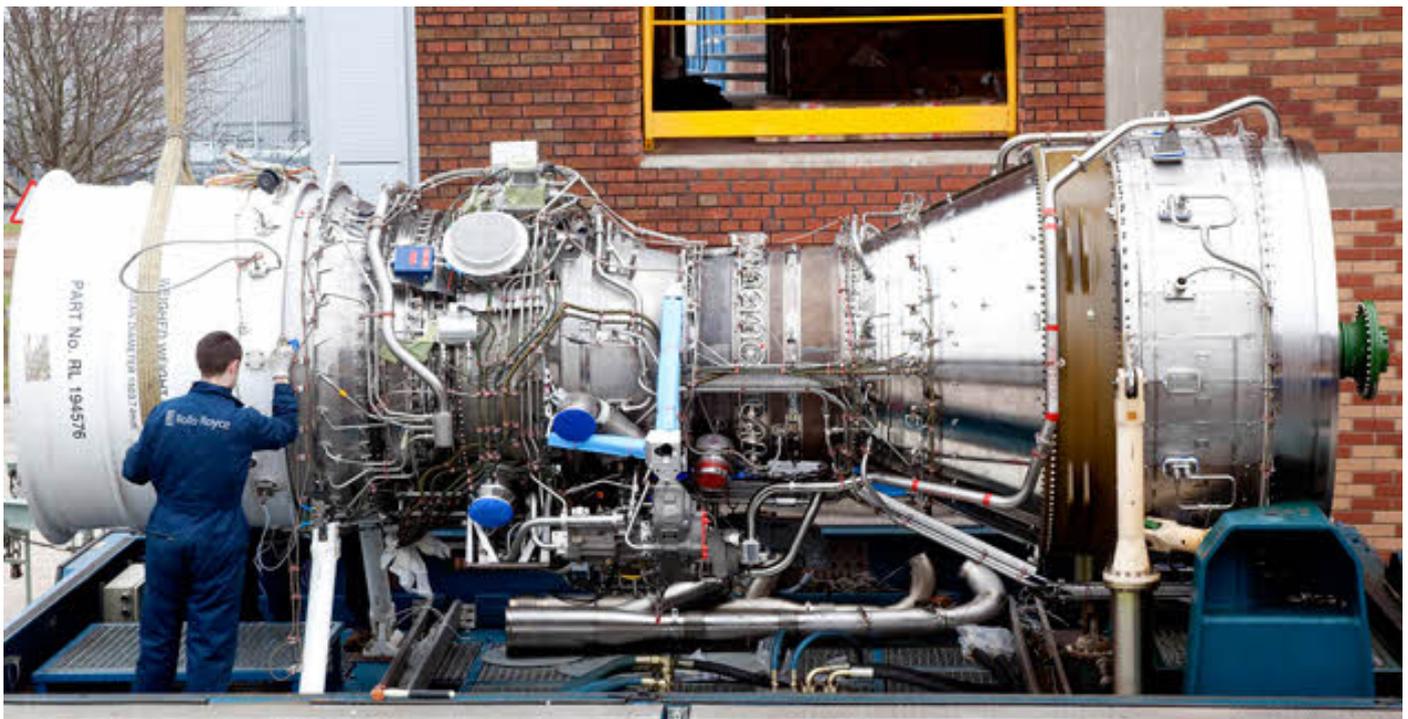


Photo: A Rolls-Royce MT30 gas turbine

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.



ACO Marine, s.r.o.
Mark Beavis - Managing Director
Nádražní 72, CZ - 15000 Praha 5,
Czech Republic
Tel: +420 257 217 990
Fax: +420 257 310 718
Email: mbeavis@acomarine.com

MARINE ENGINES

HHI DELIVERS ITS 10,000 HIMSEN

Hyundai Heavy Industries delivered its 10,000th HiMSEN engine this month, marking a significant milestone in the Korean company's expansion into the medium-speed four-stroke marine engine market.

The 10,000th HiMSEN (Hi-Touch Marine and Stationary Engine) was installed onboard a 14,400TEU containership under construction for Costamare.

Since launching the first engine in 2001, the result of 10 years of research and development, HHI has exported the HiMSEN range (pictured) to 550 customers across 43 countries and adapted the engine for use with alternative fuels, including LNG.

In September last year, HHI, the world largest shipbuilding and engineering conglomerate, introduced the next generation CLEAN (Customer, ReLIability, Environment, Acceptable Technology, No Defect) HiMSEN engine, citing a 20% per cent power output increase and 2% fuel efficiency improvement compared to the existing same class four-stroke engines. The engine also benefitted from a 10% reduction in size and weight.



FIRST ETHANE CARRIER ENGINE PASSES TYPE APPROVAL TESTS

The G50ME-C9 engine built to power the world's first ethane-fuelled liquid ethane gas (LEG) carrier has successfully completed type-approval tests.

Carried out at Mitsui Engineering & Shipbuilding in Japan and overseen by classification society DNV GL, the MAN Diesel & Turbo engine was tested as an ME-C type running on marine gas oil (MGO) but its gas system also successfully completed a pressure and function test. The first test and operation on ethane gas will take place after loading in Texas aboard the 36,000m³ LEG carrier once ethane gas has been bunkered, after which the engine will officially be named a 7G50ME-GIE (Gas Injection Ethane) type.

The engine will power the first of three LEG carriers to be built in China by SinoPacific Shipyard for the German shipowner Hartmann Reederei.

Besides operating on ethane, the flexible ME-GI engine can operate on HFO, MDO and gas oil.

In February (see *MEM1*), it was announced that a further five 6G60ME-GIE(gas injection ethane)

engines have been ordered for five 85,000m³ very large ethane carriers (VLEG) under construction for the JACCAR/Hartmann Reederei joint venture.

This brings the total of ethane-burning ME-GIE engines on order with MAN Diesel & Turbo to eight with more in the pipeline, said the enginebuilder.

The ME-GI dual-fuel low-speed engine gives shipowners and operators the option of using either heavy fuel oil (HFO) or gas, while the new ME-LGI version is capable of operating on methanol. The enginebuilder is currently developing an ME-LGI version capable of running on LPG.

MAN Diesel & Turbo sees significant opportunities arising for gas-fuelled tonnage as concerns about both CO₂ and SO_x emission increase. According the enginebuilder, research indicates that the ME-GI engine delivers “significant reductions” in CO₂, NO_x and SO_x emissions and, in contrast to competing engines, has only a negligible, unburnt gas slip.

PURE GAS FOR HØYDAL SISTER

NSK Shipping's new cargo carrier under construction at Turkey's Tersan shipyard will be powered by LNG-fuelled engines. The propulsion arrangement will be based around an eight cylinder Rolls-Royce Bergen C26:33 gas engine rated at 2160kW.

As part of the US\$65M contract the manufacturer will also supply its Promas combined rudder and propeller system, tunnel thrusters bow and aft, and a Rolls-Royce automation and DP system.

When the 81.5m vessel is delivered in 2017 it will transport fish food along the Norwegian coast on behalf of BioMar Group.

The new cargo carrier will be a slightly larger sister ship to the Tersan-built *Høydal* which, at the time of delivery in 2012 was the world's first LNG powered cargo vessel. Both ships are designed by NSK Ship Design.

Kjartan Karlsen, NSK Ship Design, Managing Director said: “We are thrilled that our designs have contributed to the use of LNG in powering cargo vessels, therefore reducing carbon footprints. We commend NSK Shipping and Rolls-Royce for being at the helm of a more sustainable industry.”

Helge Gjerde, Rolls-Royce, President Offshore and Merchant Solutions, said: “BioMar and NSK Shipping invest in modern technology that helps reduce fuel costs and the environmental footprint. They are among the absolute frontrunners in the area of short sea shipping.”

Bergen Gas Engines are the only pure gas engines on the market using a spark plug ignition. Alternative dual-fuel engines use a small amount of diesel for ignition. The B and C series engines emit around 22% (including methane slip) less CO₂ per unit of power than a diesel engine and nitrogen oxide (NO_x) emissions are reduced by 90%. Sulphur oxide (SO_x) emissions are negligible. Bergen gas engines are claimed to deliver a significant reduction in fuel and lubrication oil consumption. In addition, maintenance costs can be reduced as well as providing for a more pleasant working environment for the crew.

ELECTRIC PROPULSION

SIEMENS GIVES BATTERY POWER A BOOST

Siemens has been commissioned to provide the complete electro-technical solution to the 90m vessel Polish shipbuilder Crist is building for FinFerries. It will be Finland's first battery-powered car ferry.

The ferry will be equipped with Siemens' electric propulsion system BlueDrive PlusC, in a scope of supply that also includes an energy storage system, variable speed drive technology for the propellers and an integrated alarm and monitoring system.



The ship's energy storage system is charged at each side of the crossing, with a shore connection to the local grid. Due to the harsh winter conditions in Finland, the ferry will have the possibility to utilise a diesel engine to support the onboard batteries which will serve as an extra boost when breaking and traveling through ice. The ferry is then operated as a plug-in hybrid vehicle.

Siemens has tailor-made a solution based on the experience gained with the world's first battery-powered car ferry *Ampere* (pictured). *Ampere* was put into operation in Norway in May 2015 and has travelled a distance equivalent to more than 1.5 times around the equator. It uses

150kWh per route, and with the change from diesel propulsion to battery, shipowner Norled has managed to reduce its fuel costs by 60 per cent.

"I am extremely satisfied that the long and thorough selection process is now finished. We've chosen Crist to deliver the vessel because of the competitive price and its ability to provide us with a vessel of excellent quality. Siemens will provide the new technology for the ship. It is a company that has plenty of experience and an excellent reputation with a similar application on the Norwegian ferry," said FinFerries CEO Mats Rosin.

Dr. Juergen Brandes, CEO of Siemens' Process Industries and Drives Division, added: "Battery-powered ferries offer a great new way to provide sustainable, efficient and reliable water transportation. As we have already proven, this project will be another milestone in environmentally-friendly technologies."

FUEL TESTING

CAT FINE TEST DEVELOPED FOR QUICK ONBOARD RESULTS

Martechnic has designed and developed a new monitoring kit to assess in-situ the overall condition of heavy fuel oil, negating the need to send fuel samples for external laboratory analysis. The MT CAT FINES CHECK enables engineers to detect the presence of catalyst fines in a quick test procedure directly onboard ship.

According to the Hamburg-based company, the use of low-sulphur heavy fuel oil is contributing to an increased number of engine malfunctions which are related to abrasive 'cat fines'. These can cause severe damage to an engine's moving parts. Cat fines are hard particles of abrasive nature consisting of aluminium and silicon oxide, and are used in the refinery process. However, if these particles remain in the bunker fuel they can score engine components.

The MT CAT FINES CHECK requires two samples of heavy fuel oil - one prior to fuel separation and one after. The HFO samples are then prepared and diluted using a reagent, after which two plastic microcentrifuge tubes are filled with the mixture and the tubes are placed in a small centrifuge in a parallel position. After ten minutes the samples can be taken out of the centrifuge and the end-results, namely the level of cat fines present in the heavy fuel oil, can be assessed.

The test takes 20 minutes and can be used with all fuel types and grades.

THRUSTERS

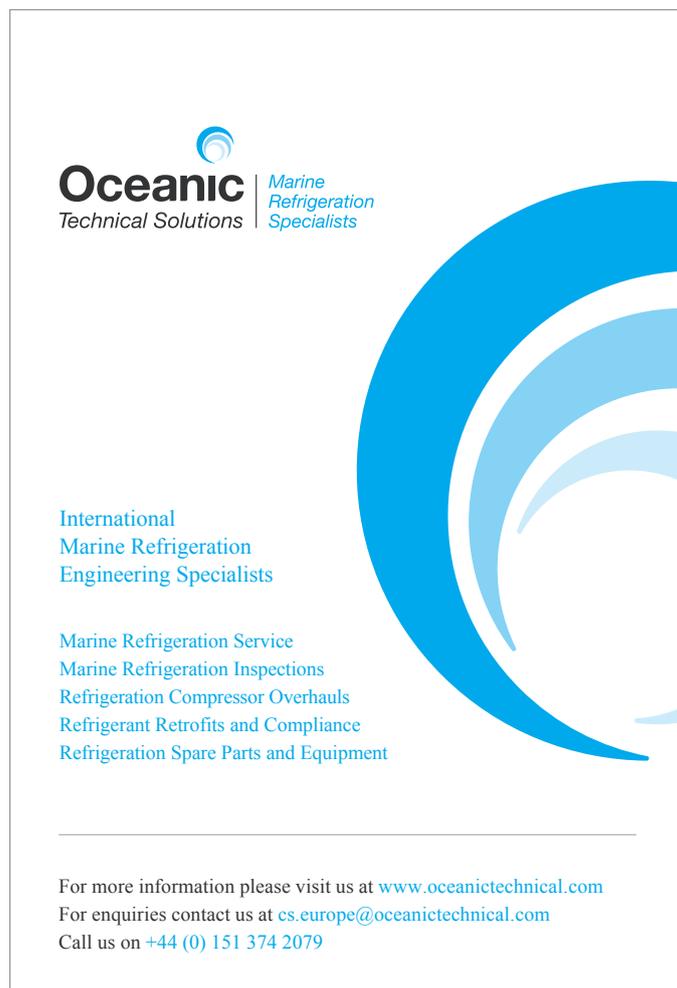
WÄRTSILÄ UNVEILS NEW WTT-40 THRUSTER

Wärtsilä used the Seatrade Cruise Global show in Ft. Lauderdale last week to showcase its new WTT-40 transverse thrusters. A first reference for the series will be a 4000kw unit with 3400mm diameter controllable pitch propeller scheduled for delivery later this year.

Development work began in 2015 in response to market demand for high power transverse thrusters for bow and stern applications, particularly cruiseships, large offshore support vessels (OSVs) and offshore construction vessels (OCVs). The high power level is particularly important for harbour manoeuvring, the docking of large ships, and for dynamic positioning of offshore vessels working in heavy sea conditions.

With a maximum power of 4000kW, the benefit to designers, owners, and shipyards is that three WTT-40 thrusters can be used instead of the customary four smaller units. This means that less space is required for the transverse thrusters. It also allows them to be located closer to the bow where they are more effective. For the WTT-40 and other sizes of thruster in the WTT series, configurations with controllable pitch and fixed pitch propellers are available to fulfil a broad range of vessel design requirements, said the manufacturer.

The new thruster features integrated hydraulics to save machinery room space and reduce shipyard installation and commissioning time. For owners, the integrated hydraulics are cited as providing increased reliability and maintainability and reduced maintenance.



Oceanic *Marine Refrigeration Specialists*
Technical Solutions |

International
Marine Refrigeration
Engineering Specialists

Marine Refrigeration Service
Marine Refrigeration Inspections
Refrigeration Compressor Overhauls
Refrigerant Retrofits and Compliance
Refrigeration Spare Parts and Equipment

For more information please visit us at www.oceanictechnical.com
For enquiries contact us at cs.europe@oceanictechnical.com
Call us on +44 (0) 151 374 2079

ESVAGT WINDFARM SUPPORT VESSEL TO BE PROPELLED BY STEERPROP

Finland's [Steerprop](#) has secured an order for two 1000kW SP 14D propulsor units to serve as the main propulsion for Danish shipowner ESVAGT's new wind support vessel under construction at Havyard.

Steerprop is scheduled to deliver the propulsors to the yard in December.

In August last year, [Havyard Design and Solutions](#) signed an agreement for the delivery of design and equipment for a Havyard 831 SOV windfarm service vessel to Turkey's Cemre Shipyard, which will build the vessel for ESVAGT. It will be operated under contract to Danish wind power company Vestas to service the windfarms Nobelwind and Belwind.

The Havyard 831 SOV, developed in close cooperation between Havyard Design & Solutions and ESVAGT, is aimed at a new niche market for servicing smaller windfarms.

BALLAST WATER

PUREBALLAST TESTS TO MEET USCGA REQUIREMENT

Following the United States Coast Guard (USCG) decision not to accept the most probable number (MPN) method in assessing ballast water treatment systems, tests of [Alfa Laval](#) PureBallast are underway using the USCGA-approved 5-chloromethylfluorescein diacetate (CMFDA) staining method. With completion expected during Q2 of 2016, the tests will enable a new USCG type approval application after receiving the results.

In mid-December 2015, the USCG issued its decision that the MPN method is not equivalent to the CMFDA staining method stipulated by the USCG Ballast Water Discharge Final Rule. This nullifies previous type approval applications of UV-based ballast water treatment systems submitted on the basis of the MPN method, including that of Alfa Laval PureBallast.

The decision applies solely to the MPN method and in no way disqualifies UV-based systems from USCG type approval. Nor does it necessitate any change in PureBallast, which is approved by the USCG as an Alternate Management System (AMS), said Alfa Laval, which has already begun CMFDA testing and expects to submit a new application following its completion.

"Alfa Laval has both a robust biological disinfection technology and a system with AMS approval," said Stephen Westerling Greer, Global Business Manager for PureBallast. "We are fully convinced of PureBallast's ability to meet the USCG criteria, so what remains is to demonstrate it according to the USCG's preferred method. This we are doing quickly in order to support our customers."

Though US ballast water regulations took effect in 2012, no systems of any technology have yet been type approved by the USCG. Meanwhile, the IMO Ballast Water Management Convention is edging closer to implementation. Following recent ratifications by Belgium and Fiji, which bring the combined gross tonnage of ratifying countries to 34.8%, a mere 0.2% more is required to make global ballast water treatment requirements a reality.

CARGO SYSTEMS

MACGREGOR OPTIMISES CSCL'S CARGO SYSTEM UPGRADE

MacGregor has carried out optimised cargo system upgrades for two 14,000TEU containership owned and operated by China Shipping Container Lines (CSCL). The vessels have re-entered service following the upgrades, which have been designed to increase payload capacity.

[MacGregor](#) and [CSCL](#) have signed a letter of intent for similar modifications for five more vessels.

The vessels were built by Samsung Heavy Industries in 2011. Their MacGregor Cargo Boost system upgrades include modifications to the lashing system along with lashing bridge enhancement and the provision of Lashmate software.

"We have been able to maximise the overall efficiency of the upgrades by carrying them out in combination with the ships' regular five-year dockings," said Captain Lu, General Manager at CSCL Stowage Planning Centre. "The Cargo Boost will enable an additional payload capacity of 300-high cube FEU (670 TEU) and will give the vessels more operational flexibility. This helps us to adapt to changing markets."

Since re-entering service the vessels have been using MacGregor's Productivity Care concept, which is designed to support CSCL in achieving the upgraded cargo systems' full potential. Their smooth re-introduction to the service includes a training programme for crew and shore-based personnel, as well as cargo system performance analysis with related guidance.

COATINGS

DSIC DEVELOPS CHINA'S OWN POLYETHYLENE COATING TECHNOLOGY

South Korea's Dalian Shipbuilding Industry Co (DSIC) has developed a new polyethylene coating technology for ships' piping systems. Taking three years to develop, the new technology and equipment necessary for polyethylene coating marks a significant breakthrough in China, which has hitherto relied on overseas polyethylene coating systems for ship piping.

The working range of the polyethylene coated piping covers DN40-DN1000 for 12m long steel pipework, including special piping with branch pipes and elbows, whose processing length can reach 3.5m. DSIC has also developed the specialist equipment required to coat pipework with the polyethylene. According to a [DSIC](#) press statement, the company has successfully applied the coating technology to pipework on a number of VLCCs.

The development is expected to boost the technical quality and level for domestic ship piping fabrication, and result in a "positive and profound influence" on technical change in the field of piping anticorrosion.

SELEKTOPE NOMINATED FOR ENVIRONMENTAL PRIZE

Gothenburg-based I-Tech's [Selektope](#) antifouling system has been shortlisted in the Environmental Performance category of the upcoming European Marine Engineering Awards, to take place in Amsterdam on 13th April.

Introduced to the market last year, Selektope is an organic, non-metal compound, which features an innovative pharmacological mode of action to combat barnacle settlement on ship hulls. This formulation sharply reduces biocide loadings for antifouling coatings and allows Selektope to be highly effective in terms of lowering fuel consumption, and thereby cutting harmful emissions and conserving natural resources, even in minute quantities. Moreover, paints including Selektope repel barnacles even when ships are at rest, allowing any fuel saving claims made by coatings suppliers to cover the ship's entire operational cycle.

Tests have shown that antifouling products containing Selektope significantly reduce fouling, lowering water resistance, and potentially saving up to 40% in fuel costs. By repelling barnacle attachment, coatings with Selektope also lower the risk of transporting invasive aquatic species from one oceanic region to another, said the company.

The first publically-disclosed project started last November at Sembcorp in Singapore, when a new copper-free product from Chugoku Marine Paints (CMP) was applied to the side walls of the 2010-built, 46,000dwt chemical carrier *Calypso* operated by Sweden's Laurin Maritime.

SENSORS

TRAFAG ADDS TO ITS ECT RANGE

Swiss sensor technology company [Trafag](#) has added a new marine pressure transmitter to its established range of ECT sensors.

The EECTN 8477 transmitter, approved for the use on ships by classification societies DNV GL, KR and RINA, is a thick-film-on-ceramic sensor based on the technology used in its ECT family of sensors. These have proven reliability in demanding industrial applications.

Capable of operating in pressure measurement ranges up to 400 bar and temperature ranges from -25 to 85°C, the EECTN 8477 transmitter has been developed to provide greater sensor protection against high levels of vibration typical in marine applications. To ensure a correct and long-term stable measurement even in highly corrosive environments, the Marine Pressure Transmitter ECTN 8477 is available in AISI316L as a standard, but also optionally in saltwater-resistant duplex steel and in titanium.



DYNAMIC POSITIONING

SEATRIALS VERIFY CLUSTER PROJECT DPS

Ubaldo Diciotti and *Luigi Dattilo* seatrials have verified the performance of [Seastema's](#) dynamic positioning system, SEAS-DPS, the tangible result from national research project CLUSTER.

The DP Class 1 SEAS-DPS system was installed in retrofit at Fincantieri's Castellammare di Stabia (Naples) shipyard and the Italian Coast Guard's Offshore Patrol Vessels are now fully operational.

Seastema CEO Alessandro Concialini said of the seatrials success: "It is an important result for Seastema R&D, since it qualifies Seastema as the only Italian company, and one of the few marine automation companies in the world, able to provide a fully proprietary DP system. The [Fincantieri](#) Group together with the Liguria research centres are a true pole of Excellence for Naval Ship technology. From a business point of view, this result enables Seastema to compete with a full range of products, one of the most complete on the market."

The scope of supply consisted of a main operator station integrated in the bridge consoles with a 19in touch screen, a functional keyboard and a three-axis two-lever joystick, a portable console which replicates in small-scale the operator station with a 10in touch monitor and three plug-in stations at the bridge wings and the aft wing. The core of the system is the SEAS-DPS controller, installed in a dedicated cabinet at the back of the

wheel house and interfaced with the propulsion system, the steering system, the bow thruster and the navigation sensors for position/heading reference and wind conditions.

Control algorithms, designed and developed by Seastema, Fincantieri's marine automation division, have a logic structured on several levels in order to ensure flexibility, modularity and scalability. This means that additional functions such as Auto-Pilot, Track-Pilot and Speed-Pilot can be implemented in the system without altering the software's core architecture.

According to Seastema the flexibility of this design is evidenced by the fact that the DP system was retrofitted on the two ships after delivery without needing extensive refitting work.

The SEAS-DPS is the final chapter of the CLUSTER research project. Partners include Fincantieri's Naval Business Unit, its Research Centre CETENA and several departments of the University of Genoa.

FUTURE TECHNOLOGY

SHIPS TO BE REMOTE CONTROLLED USING DRONES, SMART SCREENS AND HOLOGRAMS



In a six minute film, Rolls-Royce has presented its vision of a shipping future in which a fleet of ships are operated from a shore-based control and monitoring centre, using interactive smart screens, voice recognition systems, holograms and surveillance drones.

The film marks the final stage of research that will inform the design and construction of a project demonstrator before the end of this decade. An effective remote operations centre is essential to the company's plans to develop autonomous and remote controlled vessels.

Iiro Lindborg, General Manager, Remote & Autonomous Operations, Ship Intelligence, Rolls-Royce, said: "We're living in an ever-changing world where unmanned and remote-controlled transportation systems will become a common feature of human life. They offer unprecedented flexibility and operational efficiency. Our research aims to understand the human factors involved in monitoring and operating ships remotely. It identifies ways crews ashore can use tools to get a realistic feel for what is happening at sea."

The research was undertaken by VTT and University of Tampere research centre TAUCHI (Tampere Unit for Computer Human Interaction) in collaboration with Rolls-Royce. It explored the lessons learned from other industries where remote operation is commonplace, such as aviation, energy, defence, and space exploration.

It uses the innovative InnoLeap approach, a VTT and Rolls-Royce-developed initiative for concept design and presenting academic studies in a graphic format.

Eija Kaasinen, Principal Scientist at VTT Technical Research Centre of Finland Ltd said: "The autonomous ship does not mean removing human beings entirely from the picture, as is sometimes stated. Unmanned ships need to be monitored and controlled and this will require entirely new kinds of work roles, tasks, tools and environments. The future shore control centre concept has been designed by emphasising the user experience of the human operators. By focusing on the operators' point of view, it is possible to introduce meaningful, pleasurable and engaging new roles for the ships' shore control centre professionals."

The video is the latest in a series of films developed to present Rolls-Royce's 'oX' operator experience concept introduced in 2014. Previous studies have looked at the user experience of future command bridges on platform supply vessels, containerships and tugs.

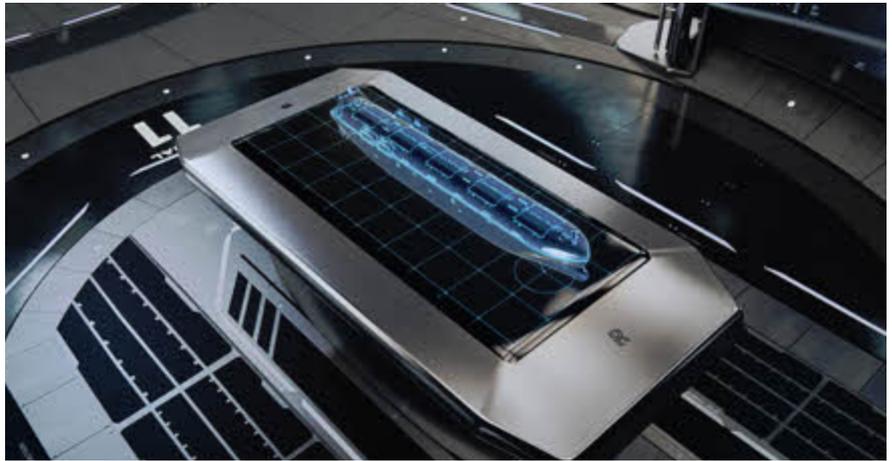
New digital opportunities are expected to shape the world of work in various industries and VTT's research helps create the conditions needed for digitalisation to promote sustainable development, employment and well-being in society. Mikael Wahlström, Senior Scientist at VTT said:

"We need to understand current work by field studies. This allows the creation of innovations that reflect the positive aspects of existing job practices, which are not always obvious. If, for example, a mechanic can assess the engine status by hearing the engine noise, it should be beneficial to be able to do the same at a remote control centre."

On 5 April in Helsinki Rolls-Royce will reveal separate research findings, which it believes will set the direction for the development of remote and autonomous shipping.

Remote and autonomous ships are one of three elements of the company's Ship Intelligence strategy, a portfolio of innovative products and services – comprising health management solutions, optimisation and decision support, and remote and autonomous operations – which will enable customers to transform their operations by harnessing the power of big data.

The film is available here: <https://youtu.be/vg0A9Ve7SxE>



POWER FROM URINE

Engineers and scientists at the UK's University of Bath have developed a Microbial Fuel Cell (MFC) capable of generating electricity from urine, in research that has the potential to meet global demand for a limitless supply of sustainable energy.

The MFC works by using bacteria to convert organic matter into energy, with urine demonstrating "to be an effective feed stock with the additional benefit of nitrogen, phosphate and potassium recovery from the fuel," state the researchers.

Publishing their findings in the paper *Towards effective small Scale microbial fuel cells for energy generation from urine*, Jon Chouler, George Padgett, Petra Cameron, Kathrin Preuss, Maria-Magdalena Titirici, Ioannis Ieropoulos and Mirella Di Lorenzo developed an air-cathode miniature MFC and investigated the effects of electrode length on power generation. They found that doubling electrode length led to an increase in power density. "The use of biomass-derived oxygen reduction reaction catalysts at the cathode increased the power density generated by the MFC up to 1.95Wm⁻³, thus demonstrating the value of sustainable catalysts for cathodic reactions in MFCs."

One of the limiting factors in commercialising MFCs in the past has been the cost of materials needed to scale up the technology and the amount of power generated compared to other renewable energies. However, researchers were able to develop an MFC prototype by connecting a stack of miniature MFCs by way of "microfabrication".

"The most viable route to boosting power density generated by MFCs is to develop small scale devices and arrange multiple units in stacks. In this context, our study aims to guide towards the development of effective miniature MFCs. For this purpose we have developed an innovative miniature MFC, which can easily be further miniaturised. We have used an air-cathode configuration since it has the advantage of greater operational simplicity and cost-effectiveness," say the authors in the paper.

**ADVERTISE HERE AND REACH OUT TO A
GROWING **mem** COMMUNITY**

For more information,
Email: mem@seabornecomms.com

FEATURE ARTICLE

MARIN UPDATES FACILITIES TO MEET DEMANDS OF A MODERN MARITIME WORLD

By Samantha Fisk

Developments in computational fluid dynamics (CFD) technology has started to push the design envelope and what can be achieved through CFD alone. The Maritime Research Institute Netherlands (MARIN) says that CFD has an increasingly important role in the optimisation of ships and offshore structures.

Modernisation of the facilities at MARIN has resulted in a new 170m Sea-keeping and Manoeuvring Basin (SMB), a new deep Offshore Basin (OB) for offshore operations in wind, waves and current and the update of the Vacuum tank with a wave generator to the Depressurised Wave Basin (DWB).

"This proved to be the right decision. Since opening, the three facilities are operating every working day in double shifts from 6am to 10pm. They provide the capabilities to make ships and offshore structures cleaner, smarter and safer," comments Bas Buchner, MARIN's President.

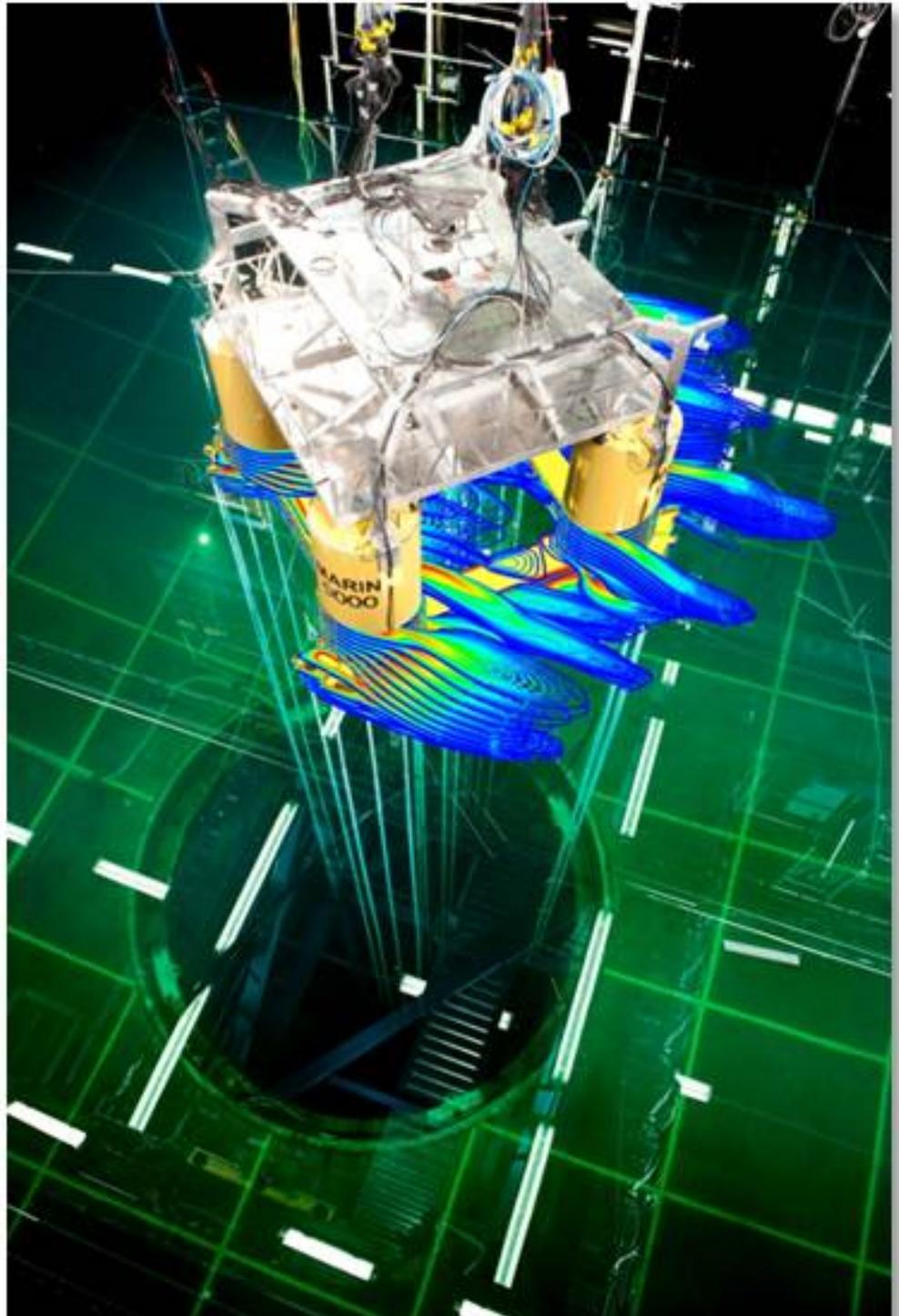
In 2016, MARIN started to renovate its wave generators with new electronics and software, along with further maintenance to the mechanical systems, which was carried out by Bosch Rexroth. This along with other developments, such as its large Bull computer cluster (4,000 computational cores) and its CFD code ReFRESC, has formed what MARIN calls its virtual facility: the maritime cluster.

"MARIN wants to use this new facility to strengthen the cooperation with the Maritime industry. To stimulate interaction with naval architects and offshore engineers, MARIN invited its clients for the 'ReFRESCO-operation'," Buchner adds. In this partnership MARIN says that it wants to share its dedicated maritime CFD code and computer cluster with the industry, so that it can jointly work on the reliable and robust application of CFD in the maritime field.

Although there is a lot of focus on CFD development, model testing still remains an important part of the design stage. Commenting on the industry's continued need of model test facilities, Buchner says: "When I started my career at MARIN 25 years ago, people said 'why do you go to a model basin, will this not be replaced by calculations soon?' I have seen calculation activities growing and growing, but model testing as well."

Last year MARIN registered a record year for model tests.

"Of course model testing now is not the same as 25 years ago.



Modernisation of the MARIN facility opens up other avenues for work

Some simpler tests are and will be replaced by calculations. But, we see more and more testing for detailed validation of CFD calculations and time domain simulations. This requires dedicated model testing with complicated set-ups, measurements and visualisation," he adds.

Buchner also highlights that the combination of calculations, model testing and full scale monitoring is the key to the future of the maritime sector. In that they are complementary as all of them have their specific roles. "I always thought that CFD would be faster than model testing. Nowadays I am not so sure, even with the increasing computer power. For instance, if you require reliable statistics for a sea-keeping problem, you need longer tests or simulations. For this type of problem model testing will still be the most efficient tool for many years," he says.

MARIN has seen more renewable energy projects in its testing facilities, such as tidal energy, wave energy and floating wind. "For floating wind testing we invested in a local windbed for high quality wind close to the rotating wind turbine. As a result, we can test the combined aerodynamics and hydrodynamics of this new type of concepts," Buchner says. In addition, the company has also tested spars, TLP's en semi-submersible types of floating wind turbine systems.

COMPANY NEWS

GOLDEN YEAR FOR TTS

Having managed to survive the numerous cyclical ups and downs that beset the maritime industry, TTS Group this month celebrated its 50th anniversary, providing a good example of how perseverance, adapting to change, hard work and a bit of luck can make all the difference in a challenging market.

It all started 1966 as a small family business in western Norway. Under the banner Sverre Munck the company produced cranes, but saw an increasing demand in the marine industries for something more than the delivery of individual pieces of handling equipment. They saw a need for complete handling solutions capable of making a range of marine operations run more smoothly.

Sverre Munck changed its name to Total Transportation Systems – later shortened to TTS – and a small consultancy was set up in London. In the ensuing years, TTS grew steadily, focusing primarily on cranes and deck equipment. Then when the relations between China and the West started to improve in the 1970s, TTS became an early mover in the Chinese market for ships equipment. In 1974 – even before the Norwegian government had officially approved of such relations – TTS signed a contract with China State Shipbuilding Corporation. Today, China is the world's largest shipbuilding nation and TTS has a strong market position in the 'Middle Kingdom' with three joint ventures: TTS Hua Hai, TTS Bohai and TTS-SCM.

Like other suppliers, TTS has experienced the peaks and troughs. The 1980s were especially bad with the global recession hitting the shipbuilding industry hard. Luckily, big equipment orders from the Kværner Govan Shipyard in Scotland came to the rescue and TTS survived.

In 1995, TTS Group was listed on Oslo Stock Exchange. This ushered in a period of acquisition-driven growth where target segments, product portfolio and operations were heavily expanded. Mongstad Engineering was included in the company in 1996. In 1997 and 2000, TTS bought the crane companies Norlift and Aktro. In 2001, TTS took over the Dry Cargo Division of Hamworthy. Takeover of LMG's crane division in 2004 strengthened TTS' access to the German shipbuilding market, while the purchase of Finnish Liftec expanded the range of solutions for loading and unloading at ports. In 2007, TTS bought the drilling package provider Sense EMD, which was later sold on to Cameron with a healthy profit. The most recent acquisition, Neuenfelder Maschinenfabrik in Hamburg, made TTS the leading player in the world's heavy lift market.

With a new market strategy aiming to develop complete vessel-type handling solutions for key players in the marine industries, TTS has come one step closer to fulfilling the vision of its founders. After a tough two-year turnaround, TTS enters its sixth decade well positioned for new growth.

DANELEC MARINE OPENS DANISH DISTRIBUTION CENTRE

Danelec Marine has opened a new European distribution center in Copenhagen to better serve its growing business regionally. Managed by GEODIS, a leading global supply chain command company, the distribution center will carry a full range of Danelec Marine products and parts, including ECDIS, Voyage Data Recorders (VDRs) and Simplified Voyage Data Recorders (S-VDRs).

The company has taken major steps over the past year to expand and strengthen its global service capability, adding new Certified Service Centres and distributors in key locations around the world. Currently, Danelec Marine has service facilities with factory-trained personnel in more than 50 countries.

The new distribution centre coincides with the development of an online portal where customers can place orders and track the status of their orders and shipments. The online service will be available 24/7 and be fully automated.

NEW EQUIPMENT DISTRIBUTION AGREEMENTS SIGNED

Dutch thruster manufacturer Veth Propulsion has appointed Nico International as its distributor for select markets in the Middle East. Nico will represent the Netherlands-based company in the United Arab Emirates, Saudi Arabia, Kuwait, Bahrain and Qatar.

Operating internationally, Veth Propulsion has thruster installations in offshore, dredger and tug vessels. The company engineers and manufactures azimuth rudder propellers, thrusters and marine electronics, and is a supplier and servicer of diesel engines and generator sets.

Delta Marine Technik, meanwhile, has been appointed as the exclusive agent for Tamrotor Marine Compressors (TMC) in the USA and Canada. Oslo-headquartered TMC is one of the world's leading suppliers of compressed air systems for marine/offshore application, with a product range that includes screw compressors, dryers and filters for any compressed air requirement, including tailor-made systems and custom engineered compressors for offshore/topside installations.

"We are excited to welcome Delta Marine Technik as our new agent in the USA and Canada," said Per Kjellin, Director of Sales and Business Development at TMC. "We believe that the expertise and local presence of Delta Marine Technik combined with TMC's unrivaled product offering will be very fruitful in the North American market."

TRELLBORG ACQUIRES LOGGERS RUBBERTECHNIEK

Trelleborg finalised an agreement this month to acquire Loggers Rubbertechniek, the Netherlands-based noise-dampening and vibration solutions specialist. The acquisition is expected to strengthen Trelleborg's antivibration operation within marine applications in Europe.

"I am delighted to welcome the acquired operation into Trelleborg. Loggers is a niche company with recognized skilled engineers at the forefront of the design and development of anti-vibration solutions. The company also has advanced digital service tools which make it easy for customers to do business with them. Our plan is for its operation to become a Marine Antivibration Solutions Center with a focus on marine systems for our global industrial antivibration operation," said Mikael Fryklund, Business Area President for Trelleborg Industrial Solutions.

HYDREX OPENS NEW ROTTERDAM OFFICE

Underwater ship repair company Hydrex has opened an office in Rotterdam to improve the delivery of its services and underwater services. The new office is expected to facilitate faster mobilisation of equipment and service teams throughout the Rotterdam port area without delaying a ship's commercial operations. Hydrex dive support vessels will also be stationed in Rotterdam.

The offices of Hydrex Rotterdam are located at the Wilhelminaplein.

Although Hydrex has been active in Rotterdam for over 40 years, the growing demand for services in the area instigated the opening of the office on the 1st of March. An example of a recent operation in the port is the installation of a doubler plate over the cavitated area of the rudder of a 170m container vessel. This operation was performed during the ship's scheduled maintenance stop.



SEABORNE COMMUNICATIONS

mem

Compiled by:

Contributor:

Publisher:

Email:

Web:

Marine Engineers Messenger

Patrik Wheeler

Samantha Fisk

Seaborne Communications Ltd

mem@seabornecomms.com

www.seabornecomms.com

The information published in **mem** does not necessarily represent the views of Seaborne Communications Ltd. The publisher makes no representation or warranty as to the accuracy or correctness of the information or accepts responsibility for any loss, damage or other liability pertaining to the information published in this newsletter.
©2016 Seaborne Communications Ltd