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SEPTEMBER / OCTOBER 2019

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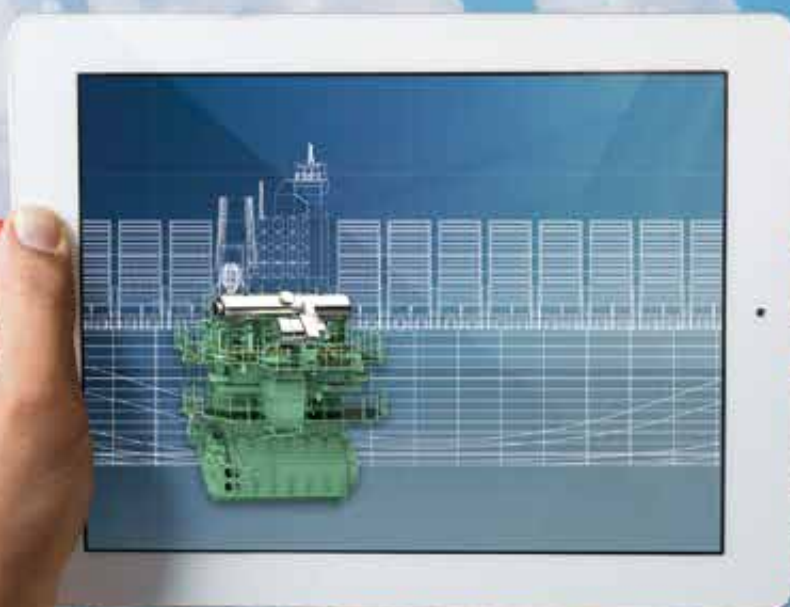
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*DNV GL is at the forefront of the world's drive towards decarbonisation.*

*New sets of rules and guidelines will be needed for the new fuels envisaged within the next couple of decades (see page 2).*

*To ensure the industry adapts to the new edicts on non-fossil fuels, class societies are adopting a more collaborative approach through IACS, as well as with other organisations, academia, etc.*

*However, this will be achieved while not diluting their core business of ship safety, which is what they were set up to do in the first place.*



# Heading towards decarbonisation

**During London International Shipping Week, it quickly became apparent just how much the environment was on everyone's minds.**

Various companies and organisations used the week to tell the world how they are going to reach the IMO's goal of cutting emissions by 40% by 2030.

While trawling through the recent tanker orders, it has become noticeable just how many scrubber fitted, LNG friendly and dual fuel ships have been ordered recently. Let's not forget that a tanker ordered today will only be 11 years old by 2030, around half way through her lifecycle.

There will still be a need for tankers by then, despite Messrs Trump and Rouhani trying their level best to destroy the free market, but for how long after that?

Fortunately, during the week DNV GL - Maritime tried to answer all our questions with the publication of the third edition of its Maritime Forecast to 2050. This year's report focused on the challenge of reducing the carbon intensity of the global fleet to meet the IMO's targets.

"Existing technology can deliver the future we desire - including meeting the 1.5 deg C target set out in the Paris Agreement," said Remi Eriksen, DNV GL Group President and CEO, sagely. "So far, support for the energy transition has been too sporadic. We need a broad and co-ordinated policy agenda that supports new technologies as they emerge and sustains that support through the build-out phase."

DNV GL confirmed what we had feared in that a combination of external market pressure and the ambitious direction set by IMO means that the challenge of de-carbonisation has been laid squarely on shipping's doorstep.

The report analysed three regulatory scenarios - continuing under current policies, regulations becoming gradually stricter, or very strict regulations introduced towards the end of the 2050 deadline - and how these could affect the transition to low and carbon neutral fuels.

Improvements in general energy efficiency in on board operations is also included as an essential part of reducing emissions.

"One of the key components to meet the decarbonisation challenge is fuel flexibility, as the fuels of today may not be the fuels of tomorrow," said Knut Ørbeck-Nilssen, CEO of DNV GL - Maritime. "This means having a picture of the entire fuel ecosystem is vital, as owners, operators, and the industry itself will have a much tougher time adapting to a low-carbon future if they are locked into a single choice."

Fuel flexibility and technologies to bridge changing fuel usage were identified as essential strategies for both individual owners and the shipping industry to adapt to the energy transition and prepare for a low carbon future.

## Groundwork

In the deepsea segment especially, dual-fuel solutions and alternative fuel 'ready' solutions could smooth this transition, by laying the groundwork for a future retrofit. Combined with bridging technologies, such as adaptable storage tanks, on board systems and shore-side fuel infrastructure, this could give the industry more options as new fuels and technologies emerge.

"Ships built today will have to compete with vessels coming onto the market in five, 10 or 15 years' time, and must consider future standards to remain competitive," confirmed Ørbeck-Nilssen. "Considering the uncertain future that lies ahead, failing to be future-proof in the newbuilding phase could lead to that asset being stranded in the not so distant future. In addition, CO2 emissions could become an important

rate differentiator and we have already seen forward-looking charterers start down this road."

Not surprisingly, the report said that the uptake of low-carbon and carbon-neutral fuels will be essential in meeting IMO GHG goals, with carbon-neutral fuels having to supply 30-40% of the global fleet's total energy by 2050.

Under different regulatory pathways, however, DNV GL's model predicted that a variety of fuels could come to the fore. In all of the pathways, liquefied methane (from both fossil and non-fossil sources) provides a large part (40-80%) of the fuel mix at 2050. It was also suggested that in the deepsea sector, ammonia, biodiesel, liquid biogas and electrofuels were promising carbon neutral options, with battery, hybrid, and hydrogen solutions being potential options for the short-sea segment.

At its launch, Ørbeck-Nilssen said that class will play a key role in facilitating the transition by updating rules and conducting continuous R&D.

He advised shipowners to try to establish a strategy today and, as an industry, shipping needed to collaborate with others, especially academia.

LNG as a fuel is seen only as bridging the gap. As for the alternatives, costs could be a problem with methanol, hydrogen was mainly aimed at the short-sea sector, while ammonia was deemed toxic and corrosive. Battery hybrids were also gaining traction among shipowners, even tanker owners, DNV GL said but the use of nuclear power was completely ruled out, following a question from the floor.

One of the key points made was to invest in flexibility, as no one knows what the future fuels will be as yet. However, one thing is certain, it is going to be expensive but worth it in the long run.

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## TANKEROperator

### Vol 18 No 8

Future Energy Publishing Ltd  
39-41 North Road  
London N7 9DP  
www.tankeroperator.com

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### SUBSCRIPTION

1 year (8 issues) - £150  
Subscription hotline:  
Tel: +44 (0)20 8150 5292  
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Printed by RABARBAR s.c.  
Ul. Polna 44; 41-710 Ruda Śląska, Poland



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# Demand uncertainty driven by geopolitics plagues markets

**Prospects for the crude tanker demand in the final quarter of 2019 remain heavily dependent on geopolitical factors, Rebecca Galanopoulos Jones, Head of Research, Alibra Shipping, said.**

**A**s the trade war between the US and China continues to escalate, in August, Beijing announced that it would impose 5% tariffs on US crude, commencing on the 1st September in retaliation to Trump's latest tariff policies levied on China.

As the world's largest importer of crude, China has drastically reduced US imports from the record-highs seen last year. According to Chinese customs data, imports for the first seven months of 2019 fell 63% year-on-year to around 126,000 barrels per day.

The reduction in Chinese imports has yet to have a profound effect on the market, as US crude is being diverted to other countries in the Asia/Pacific region.

Further geopolitical concerns continued to weigh down on tanker market sentiment. For example, the recent attacks on the Saudi Arabian oil production in mid-September, causing the shut down the oil processing plant at Abqaiq, are expected to cause further disruption to tanker markets.

The incident is expected to temporarily reduce global oil supplies by around 5%.

State owned oil company Saudi Aramco had indicated that it might be able to restore a significant volume of the current daily production of 5.7 mill barrels within a matter of days, but it will take weeks to restore full capacity.

The IEA commented that whilst it is monitoring the situation closely, the agency considers the markets to be currently well

supplied with ample commercial stocks.

There is very little excess capacity available within the market to replace the lost barrels of crude. However, should the situation escalate, the wider repercussions to the market might be harder to accommodate and could impact crude spot rates negatively at least in the short-term.

## Supply

With the 1st January IMO sulfur cap regulations swiftly approaching, a number of crude tankers have been taken out of service in order to retrofit scrubber technology. This move will enable the vessels to comply with the new emissions ruling but continue to use high sulfur fuel oil.

From what Alibra Shipping has seen, scrubber installations are taking longer than estimated by as much as a week to 10 days, which was to be expected, as the best-case for retrofitting scrubbers was always too optimistic.

However, it is still too early to say if the yards are falling behind schedule. From a supply and demand perspective, scrubber installation is temporarily limiting tanker supply, which is of course good news for the market.

The fleet delivery schedule for crude tankers in the final quarter of 2019 is heavily focused on VLCCs. Thus far, 47 vessels have been delivered this year and there are a further 25 vessels due to be delivered by the end of 2019.

In contrast, Suezmaxes have seen 25 new deliveries this year with only four slated for delivery in the remainder of 2019. In the Aframax sector, there have been 45 vessels delivered at the time of writing (mid-September) and 11 vessels are expected to be delivered in the final quarter of the year.

New tanker orders appear to be slightly lower than seen in the same period last year,

**Crude oil tanker fleet growth**  
2015A-2021E



Source: BIMCO estimates on Clarkson's raw data

A is actual. F is forecast. E is estimate which will change if new orders are placed. The supply growth for 2019-2021 contains existing orders only and is estimated under the assumptions that the scheduled deliveries fall short by 10% due to various reasons and 25% of the remaining vessels on order are delayed/postponed.



which could be good news following the tanker order boom in 2015, which has made a significant contribution to the current over supply that the tanker market is experiencing, Alibra said.

### Saudi events

Turning to events in Saudi Arabia, Poten & Partners' Erik Broekhuizen commented that the interruption caused by the drone attacks on 14th September, represented about 60% of the Saudi crude oil exports and more than 5% of global oil demand.

The outage primarily affected the production of Arab Light and Arab Extra Light, both light to medium heavy crudes with relatively high sulfur content.

Initial reports indicated that the outage could take weeks or months to resolve, but recently Saudi officials indicated that production would be back to normal within two to three weeks. It is uncertain whether this statement was intended to calm the markets or if this was a realistic assessment, he said.

Oil prices initially leapt about 20% but gradually declined. The market realised that geopolitical risk had increased, and the WTI forward curve remained about \$1.50 per barrel above pre-attack levels.

Tanker loading has resumed, using mainly crude from inventories. Some of the cargoes scheduled for the coming weeks have been delayed by one to two weeks, and some buyers will receive heavier grades, if the refinery configuration allows them the ability to use these grades.

Saudi Arabia has reportedly cut crude supplies to its own refineries, and the country has also started buying petroleum products to compensate for lost production. It is believed that the country can initially supply customers out of inventories, but it will be interesting to see what the situation is in a couple of weeks, if the facilities are still running at significantly reduced capacity, he said.

More than 70% of Saudi's total seaborne exports have been shipped to Asia thus far this year, due to growing demand. Furthermore, the Atlantic already has a surplus of crude. However, the Saudi's are also focusing on Asia to drive down inventories in the Western hemisphere (where inventory levels are widely reported and monitored by traders).

Tanker rates, particular for large crude oil tankers, reacted quickly to the events in Saudi Arabia, although much of the freight rate increase was caused by higher bunker prices. VLCC rates from the Arabian Gulf

to the Far East increased by 9WS just after the attacks (TCE \$27,000 - \$35,000 per day) and continued to increase gradually to WS70 (TCE \$40,700 per day) by 20th September.

On the other hand, large product tanker rates have weakened, especially for the naphtha trade out of the Arabian Gulf. For example, TCE's for LR2's on the AG to the Far East route declined from \$16,000 before the attack to \$10,000, before recovering slightly to \$12,900 per day.

This year, the forthcoming implementation of IMO2020 will create extra pressure on rates, as some tankers will temporarily be out of service to install scrubbers. Many ships will also need to switch to more expensive low sulfur fuels ahead of the 1st January deadline and freight rates will likely start to reflect these higher bunker costs before the end of the year.

As a result, the Saudi situation, plus other world events meant that the tanker markets were facing significantly higher upside risk than before the attacks, Broekhuizen said.

BIMCO's Peter Sand agreed that tensions had risen following the expiry of waivers to the US imposed Iran sanctions, as well as attacks and arrests of ships sailing through the Strait of Hormuz.

Sand acknowledged that his comments were written before the Saudi oil facility drone attacks but claimed that his analysis was still very relevant.

Despite the ending of waivers on Iranian crude imports, the Chinese have continued to buy. Chinese imports of Iranian crude totalled 11 mill tonnes in the first six months of this year, which was 30.1% lower than last year. Imports have slowed throughout the year, averaging 2.3 mill tonnes in the first four months but subsequently fell to 1.1 mill tonnes in May and 0.9 mill tonnes in June, 2019.

Exact data for Iranian crude oil exports does not exist, Sand said. However, Reuters reported that a Trump administration official said that 50-70% of Iranian's crude oil exports are bound for China and around 30% for Syria.

Iran's President Rouhani was quoted by Reuters as issuing a veiled threat that, should Iran's crude oil exports be forced to zero, security in international waters could not be guaranteed.

### Fleet news

Similar to Alibra Shipping, Sand took a look at the state of the tanker fleet at the middle of August saying the total tanker fleet had grown by 4.3%. Growth in the crude oil tanker fleet

was particularly high and BIMCO forecast a full year growth of 5.3%.

This higher fleet growth comes not only from increased deliveries, but also from slower than expected recycling, Sand said.

Only 2.1 mill dwt of crude oil tankers had been demolished by mid-August, and in response, BIMCO lowered its expectations for crude oil tanker recycling for this year from 9 mill down to 4 mill dwt.

In contrast ordering had picked up. New orders for the total tanker fleet increased to 13.1 mill dwt. Since May, six VLCCs have been ordered, as well as 30 Aframaxers. The already over supplied market has no need for extra ships, and further ordering will only worsen future market conditions, he stressed.

With only 0.6 mill dwt having left the oil product tanker fleet, deliveries of 6.4 mill dwt has meant fleet growth of 3.5% thus far this year. BIMCO forecast a full year fleet growth of 4.4%. Even with the demand boost to the oil product tanker shipping sector expected to come, this high fleet growth will put pressure on earnings.

Saudi Arabia has overtaken Russia as the largest supplier of crude to China, as the two countries sent 37.8 mill and 37.7 mill tonnes, respectively in the first half of this year.

The increase in volumes from Saudi Arabia is good news for the tanker sector, as most Russian crude oil exports to China are shipped through pipelines, and therefore have no effect on the crude tanker market.

A return of Chinese buyers to the US crude oil market would provide an even larger boost for crude oil shipping, as it would increase tonne/mile demand, if the two countries can agree to drop their trade tariffs.

Another boost came from the ramping up of refined oil product exports worldwide, as the traditional Autumn maintenance season will be shorter, meaning that volumes will not fall as much as usual. As refineries start producing and selling low sulfur fuel, product tankers will be employed to ship the fuel.

Should the Strait of Hormuz be further threatened, or completely closed, the tanker market would face severe consequences, Sand concluded.

As Tanker Operator went to press, news was coming in that the US State Department had placed sanctions on COSCO's tanker arm and other Chinese tanker companies for allegedly trading with Iran.

Whether this will dissuade charterers and trading houses from doing business with these companies remains to be seen but of course much of the finance is US backed and some business is re-insured in the US.

# CSM's O'Neil outlines the future of shipmanagement

**At a presentation given at the offices of insurance giant Marsh during London International Shipping Week, Mark O'Neil, Columbia shipmanagement (CSM) CEO gave his views on the future of shipmanagement.**

**H**e started off by saying there should be an absolute focus on quality, transparency and warned about being distracted from the core business of shipmanagement.

Describing the phrase 'third party shipmanagement' as an anachronism, he said that today, companies need to offer a client facing tailored approach, which allows for fine tuning of the product(s) being offered.

A clear commitment to HSEE excellence and continuous improvement must be demonstrated, he said. He also advocated the need for a recognition of the market sectors and the clients within those sectors changing needs and indeed within those sectors themselves.

Services needed to be optimised to clients, ie be client facing. "You need to concentrate on the service. Concentrate on the business and you will lose," he warned, adding "don't be ahead of the curve, as companies won't use it."

CSM sees itself as a service provider covering many segments of vessel and people management, offering a comprehensive portfolio of non-commoditised services to the shipping industry, which should be tailored, relevant and compelling, he said. "A commoditised product is not good enough



today," he stressed.

Shipping is changing with more vertical supply chains for improved efficiency and economic certainty. He also warned that the march towards consolidation was inevitable. Today, there is a huge separation between operations, management and ownership, with asset control sometimes coming under finance in the case of lease/lending formats.

"We need to de-romanticise shipping, as it is part of the logistics chain," he said, adding that there is a need for compatibility with other market systems and platforms and transparency of operation.

## People first

Also recognising that people were at the forefront of the business, he claimed CSM was the first company to offer a 24/7 helpline for mental health issues, which O'Neil said was important commercially, highlighting the case of a seafarer becoming locked in a store room for the safety of the ship and those around

him or her, which could lead the vessel being delayed or even off-hired in an extreme case.

CSM also takes shipboard catering seriously having partnered with fellow Cypriot-based company MCTC. Another interest connected to fellow shipmanagement concern BSM is GP General Procurement Company (GenPro), which is an independent procurement company based in Limassol, which was founded by CSM and Bernhard Schulte Shipmanagement (BSM).

GenPro's role is to negotiate a framework supply agreements with international ship suppliers on behalf of its members' clients with a view to securing the lowest prices achievable on all consumables. Thus far, GenPro has a portfolio of 800 vessels.

O'Neil also spoke of the need for centres of excellence to be set up. For example, late last year, CSM opened a Performance Optimisation Control Centre in Limassol, which is also open to shipping companies not using CSM's services.

This project, put together with Tototheo



CSM's CEO Mark O'Neil





CSM's Limassol control room

Maritime, allows 24/7 support, by which CSM will be able to quicken decision making and give greater visibility using modern technology to achieve cost efficient vessel operations. The Control Room's functions will optimise vessel navigation, safety, security, fuel consumption operations and crew functions, including rotation and training, thus saving a client overall operating costs.

He stressed that technology and digitalisation must be balanced against people. They are merely tools to enhance, but not replace, human performance.

O'Neil also warned that there was a real dearth of new talent coming into the industry.

He also reiterating the need for healthy eating, exercise and a healthy mind to ensure a good performance, hence the tie up with MCTC and offering the 24/7 mental health helpline. Companies also need an effective human resource management element and a career path should be visible to an employee both ashore and at sea.

"A person should be viewed as an asset on a balance sheet and not as an expense," he said. Strong corporate values should be identified and understood, such as in CSM's I CARE philosophy.

O'Neil said that he was an advocate of general, client and sector training, which he described as crucial, adding that training is a lifelong learning curve, as everyone at all levels needs to be up to date. A different focus is needed on training - adaptive, initiative, proactive and resilient based.

He revealed the CSM was planning to set up a training centre in the Philippines in about a year's time.

"The quality of training seafarers is the

biggest differentiator," he said, claiming that STCW was out of date as it takes too long to change anything. CSM is a promoter of eLearning apps and has partnered with Adobe to provide the apps to the seafarers and also seminars are held connecting various

departments, as part of the training delivery package.

He said that he was also a champion of the 'big is beautiful' school of thought. "You have to have size. Economies of scale are a must," he said to maintain a client focus tailored approach. Procurement platforms, such as GenPro, were also key to the future, he added.

Returning to the theme of digitalisation, O'Neil said it was not an end game but just a means to an end. The end was optimisation, he stressed. For example, managers have to offer clients optimised operations so that they may in turn offer charterers/operators the same benefits, which can also involve insurers, banks, traders, etc.

Following the entry of IMO2020, fuel consumption and tank management will need to be optimised, explaining that the large charterers and commodity trading houses were looking more into performance optimisation, hence the need for the Limassol Performance Optimisation Control Room, he said.

Finally he said that CSM was striving to maximise vessel uptime and overall service efficiency. "Avoid any interruption or the unexpected," he stressed.

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### Performance Optimisation Control Room

CSM's Limassol control room was opened in December last year but it has been evolving for the last 10 years or so.

It is now open to all commercial interests, such as owners, charterers, banks, pool managers, etc.

It is fully integrated with other systems used by clients and their clients, such as vessel charterers and operators.

Earlier this year, CSM said that it had a vision for fully connected vessels with near real-time information exchange, strengthened processes, decision-making and value creation for customers through end-to-end voyage optimisation.

Three aspects are critical to achieving this vision - implementing a scalable platform, ensuring the right people are working for you, and facilitating robust processes of business - Platform, People and Process - the three 'Ps'.

The centre is able to monitor weather, earthquakes, tsunamis and other hazardous occurrences worldwide, including winds, waves and currents, which could affect a planned voyage. Port traffic can also be examined and as a result, the pre-departure process analysed to see if a voyage needs changing.

A vessel's performance is shown using a traffic light system with a vessel performance dashboard and it is based

on a benchmarking system, which can be analysed by using different methods and as a result, the top negative performances will be identified.

Each vessel's speed and consumption is monitored on a daily basis and compared with peer group ships and sisterships. The information gained can then be shared with the vessel's superintendent.

Charterparty clause compliance can also be monitored and a voyage audit report produced. CSM claimed that around 95% of charterparty clauses can be covered. For example, the reason for a course change can be communicated to the charterer and data relayed in the case of disputes to prove a point.

Company security officers are also on hand to help should a vessel be identified as entering an area of concern.

Ships' data can be monitored by the centre without the use of sensors or flow meters, etc. "The sky is the limit as the system is very flexible," CSM said during the presentation.

CSM conceded that the crew's expertise was needed to input the data correctly but urged the shore backup team in the centre to keep asking the question - why?

Overall, costs can be saved by using performance control optimisation, especially as fuel costs will inevitably rise, especially following IMO2020, CSM explained.

# Lack of finance hurting German shipping activities

**Appropriate analysis must be followed by specific measures without delay, the German Shipowners' Association (Verband Deutscher Reeder VDR) said at the end of the 11th National Maritime Conference (NMC) held in Friedrichshafen last June.**

In analysing the difficult situation of German maritime shipping, especially in the light of the general conditions regarding their competitiveness, the participants agreed that Chancellor Merkel was right in saying that we must fight. The issue now is to implement this into concrete political action without delay," said Alfred Hartmann, President of the German Shipowners' Association at the time.

He said that it was of decisive importance for shipping companies to ensure that competitive conditions in Germany must be shaped in such a manner as to enable shipping companies operating from the country to survive and further develop in fierce international competition.

Hartmann said that "it was undisputed that maritime shipping remains an industry characterised by steady growth," adding that: "In her speech (at NMC), Germany's Chancellor Angela Merkel demonstrated once again how well she is acquainted with maritime topics. When she says that policy makers are obliged to ensure that reasonable framework conditions are in place, then this is a clear demand not only to secure but also to enhance the competitiveness of Germany as a maritime location," adding that "This is where Germany has considerable pent-up demand."

Looking at other European comparisons, to some extent neighbouring states like Denmark or the Netherlands had substantially improved the framework conditions for their maritime shipping sector. "The sudden demand for implementing insurance tax for shipmanagers was the key example at present to show how Germany was losing its lead: nowhere in Europe are insurance policies in connection with maritime



**VDR head Ralf Nagel**

shipping activities taxed as heavily as in Germany. Many states don't even know a tax of this kind," Hartmann stressed.

He also referred to the substantially more difficult access to capital by German shipping companies. The three most important shipping finance banks for the German fleet have withdrawn from the business, which makes it particularly difficult for German shipping companies to invest in sustainable and efficient ships. He said that unless any sustainable new concepts could be found for Germany, its share of the global maritime fleet and also for downstream services would decline significantly: "We plan to discuss these issues with the federal government in order to develop appropriate solutions," he said.

He indicated that the industry was obliged to take care of its succeeding generations, especially in difficult times. "The high quality of shipping services offered from Germany remains key to the future viability and competitiveness of our maritime sector.

The most important measure to secure vocational training and employment is to have sufficient operations with ships registered in Germany," he stressed.

Hartmann also confirmed that German shipping companies would make their contribution to environmental and climate protection: "Starting on 1st January next year, the end to the use of heavy oil in shipping will be initiated. However, we will need more, namely environmentally and climate-compatible new fuels for the future. In this context, the federal government's programme to foster the use of LNG is a good but small start. A directive for financial support that is suitable for German shipping operating on an international scale will need to be found soon. If not, the good approach will not be successful."

Updating the situation, VDR spokesman Christian Denso told *Tanker Operator* that the biggest problem facing German owners is the lack of finance available.

With the three largest banks, Commerzbank, HSH Nordbank and NordLB, have or will disappear from the market – especially NordLB which is selling ship credits at present, this means an unknown future for a many, especially the smaller shipping companies in Northern Germany and might change the landscape dramatically.

He said that the VDR is in talks with all the relevant parties, but so far the organisation is not too optimistic that this challenge will be solved in the next weeks or months.

IMO2020 is also of course a big topic for German shipowners and shipmanagers – as there are still a lot of uncertainties regarding price, availability and compatibility. But in general VDR members are positive and

willing to fully comply with the rules – and he said that everyone else is expected to do the same.

On 15th August, 2019, the VDR lost one of its leading lights, as Prof Dr Dirk Max Johns left to devote more time and effort to his lecturing activities as Professor at the Hamburg School of Business Administration (HSBA).

However, he will still be available to the VDR in an advisory capacity in the future. At the HSBA, he is in charge of the university course of studies for the Maritime Management bachelor programme, as well as of the Business Development master programme.

Prof Dr Johns' tasks were assumed by the VDR management, namely CEO Ralf Nagel and Managing Director, Dr Martin Kröger, in tandem with their other activities.

In another move, against the backdrop of the extension of mobile communications networks planned in Germany, the VDR and the German Federal Chamber of Pilots (Bundeslotsenkammer – BLK) issued a joint communiqué calling for urgent improvement of mobile network coverage in German coastal waters.

Maritime broadband communication in the North Sea and Baltic Sea was the topic of a recent symposium jointly held by the Maritime Cluster Northern Germany (Maritimes Cluster Norddeutschland e. V. – MCN) with the VDR and the BLK.

VDR CEO Nagel, said: “At present, Germany is quite justified in discussing 5G standards in order to be fit and prepared for digital change. In addition, this inseparably extends to include decent broadband communication at sea. We certainly have pent-up demand in this regard. A digital infrastructure is a prerequisite for this, however, in order to make Germany future-proof as a port and maritime shipping location in German coastal waters, we will need to become more competitive in this area, too.”

Erik Dalege, BLK Chairman added: “Hundreds of ships pass through the German Bight alone, every single day. In particular, there is an urgent need – for safety reasons on the highly frequented nautical ‘motorways’ off the German coast – to ensure that in our role as pilots, we receive the mobile network coverage necessary to make use of state-of-the-art software.”

Dominik Eisenbeis, MCN Chairman, commented: “A broadband connection is absolutely indispensable in any economic environment. It is of fundamental

importance for digital innovation and, therefore, also for maintaining and improving the competitiveness of the businesses operating them. These foundations are sadly lacking in large parts at sea, however. In its role as the innovation driver of the maritime sector, the MCN therefore supports the political demands of the VDR and the BLK with huge emphasis.”

German coastal waters broadband infrastructure necessary for maritime digitisation is still heavily underdeveloped at present. For instance, mobile phone reception in the 200-mile area of what is termed the exclusive economic zone (EEZ) is largely intermittent or even completely non-existent. In such cases, communication takes place via FM radio or by satellite telephone.

“Our seafarers working on those ships would be glad to have mobile telephone reception near the coastline, with at least fairly comprehensive coverage. The North Sea and Baltic Sea and even Kiel Canal are still partly dead zones, as far as reception is concerned,” said Nagel.

In addition to commercial and passenger vessels, this also applies to the German Navy, the Federal Police and the vessels operated by the German Maritime Search and Rescue Service (Deutsche Gesellschaft zur Rettung Schiffbrüchiger – DGzRS).

“The pilot project COAST link run by the VDR member shipping company Scandlines has shown what improvements are possible,” Nagel said, explaining that this shipping company successfully deploys modern technology both in the transport corridor across the Fehmarnbelt, as well as operating between Gedser and Rostock.

Dalege added: “The VDR and the BLK have already called for an

improvement in the necessary infrastructure on a number of occasions in the past. Now it is high time for this subject to be tackled with concerted action, such as in a working group at federal and state level.”

The MCN supports and reinforces collaboration within the Northern German maritime sector. It facilitates platforms for dialogue for all players, promotes innovation and creates interfaces with other industry segments.

The maritime cluster consists of offices in Bremen, Hamburg, Lower Saxony, Mecklenburg-West Pomerania and Schleswig-Holstein and co-operates with those responsible at the various locations. It provides support in finding innovation partners, guidance concerning promotional funding and arranges contacts as an intermediary within the maritime sector.

The organisation has over 350 enterprise and institutional members from the business community, scientific and political circles.

Denso commented that the VDR is quite confident that this will improve sooner or later. “We are in talks with the relevant authorities,” he said.

TO



# German shipowners diversifying into other areas

One of the most famous names in German shipowning down the years is Ernst Russ (ER).

**T**oday, this company is almost unrecognisable, as it is now primarily an investment concern.

However, shipping is still one of its core interests.

In the company's first half of this year's results presentation, ER said it had made additional important investments in both core business areas - shipping and real estate.

In the Shipping sector, the fleet was expanded through the acquisition of the majority shareholding in a ship portfolio comprising a handymax bulker and a 3,100 TEU containership, as well as the acquisition of a 4,200 TEU containership.

ER also said that the disposal of both its investor management and solar businesses has allowed the group to make an essential step forward in the stabilisation of its business model as an asset and investment manager.

Investments made in the first half of 2019 led to an increase in total equity and liabilities of €14.1 mill to €117.5 mill. Despite a consolidated net loss of €0.6 mill in 1H19, which was influenced by one-off effects, equity was up from €51.1 mill to €58.5 mill, which resulted in an increased equity ratio of 49.8%.

Therefore, ER's half-year performance was mainly attributable to the streamlining of the Group's structure, which will enhance its ability to act effectively and in a flexible manner in the asset investment and management segment in the long term, the company said.

ER currently manages a fleet of around 80 containerships, tankers, bulk carriers and

other vessels, as well as looking after a total of 40 properties at 28 sites.

A company spokesman confirmed to *Tanker Operator* that ER is presently focused on container vessels and also has bulk carriers and RoRos in its portfolio. In addition, in the last three years the company managed various Handysize, LR1 and Suezmax tankers.

Today, it has six Suezmaxes, which were originally financed by shareholders under the German KG model, which has since ceased.

In the German shipping market, the containership is still dominant. And there are no signs that this might change in near future. However, with ER's experience in tanker management, the company is watching the tanker market and might take tankers in, if suitable conditions and opportunities arise, the spokesman said.

Regarding ship financing, the most limiting factor is the availability of equity and financing.

After the collapse of the German KG model, German shipowners have not been able to gain new funding sources since. Some have successfully raised money from family and friends but this will not be a solution to make the German merchant fleet grow in the longterm, ER said.

Further, it has become more and more difficult to get senior financing for a single unit. Although many banks are still showing appetite for ship financing, today they are starting at higher numbers.

A typical well thought of German shipowner with a small investment in only one vessel is in a weak position and has to

accept high margins and tight covenants for a first ranking loan.

It won't be easy to make such an investment a success, due to paying high interests and by agreeing a strong repayment profile. Other solutions have to come into place, he concluded.

## Value chain

Another diverse group is Dr. Peters.

Today, this group is an investment and asset manager focusing on assets across three classes - aviation, shipping and real estate.

As one of the leading European players, Dr. Peters has been managing real asset investments since 1975. The group has experience of investing in 88 vessels of around \$4.7 bill in value across tankers, bulkers, containerships and multi-purpose ships, typically deployed on long-term timecharters to industrial customers.

In shipping Dr. Peters controls the full value chain of asset investing including shipmanagement. With specialised subsidiaries and highly qualified employees, Dr. Peters' shipping arm offers a comprehensive in-house service to its partners, including commercial, technical and cargo management, financial and corporate management, as well as crew and travel management, a company spokesperson told *Tanker Operator*.

Dr. Peters tanker business has been active globally in the commercial crude tanker market for larger tankers for 10 years, under the banner of DS Tankers.

The company said that it saw huge potential in the tanker segment with a focus on crude oil tankers, in particular.

"We offer investment opportunities in a diverse range of shipping products focused on oil tankers of different sizes, such as VLCCs, Suezmaxes, Aframaxs and Panamaxs. However, we are also considering product tankers and chemical tankers as part of the portfolio," the spokesperson concluded.



One of DS Tankers' VLCCs



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# New IACS Chairman outlines his policies

**In a presentation last month, new IACS Chairman, IR Class' head Arun Sharma outlined the organisation's workload going forward and gave a few thoughts about the industry as a whole, alongside IACS secretary general, Robert Ashdown.**

**O**verall, the industry was in slow growth mode but uncertainty prevailed, due to trade wars, geo-political events, etc, he said.

Environmental concerns are driving regulatory changes, which will have a significant impact on the way the shipping industry operates. As a result the forecast reduction in oil & coal shipments is likely to reduce demand for tonnage.

"The move away from fossil fuels will have a huge influence on tankers," he said. The forthcoming IMO2020 regulation will also have a market impact with a price differential between HSFO and LSFO of around \$200 per tonne, according to the futures market.

Technological innovations are driving efficiencies and are also enablers of change. A lot needs to be done, as there are too many 'ifs and buts' in the next one to five years for technology and the need to de-sulfurise. "Significant research needs to be done," he said, referring to the development of zero carbon fuels and their related technologies.

While safety of life and protection of environment remains at its core, class societies are increasingly seen as facilitators in helping the industry comply with the new regulatory requirements by way of offering technical expertise beyond the traditional class role and evolving as a solution provider to the industry.

Thus class will have increasing focus on coping with technology changes, which will be aimed at more efficient ships using new fuel types, changing trade patterns and enhanced safety. The industry needs to be able to handle this new technology, he said.

For example, data analytics will be a real issue in one to two years. "We (the industry) need the right people to analyse the right data and make the right decisions at the right time," he stressed. "Use of data would be more and more important, as we adopt condition based monitoring and surveys and also in taking a partnership role with the industry in improving efficiency of ships to meet IMO GHG ambitions.

"If you don't have data, you cannot run a



**New IACS Chairman and IRClass head Arun Sharma**

ship properly," he added.

## Validation

Validation of new technologies is also important, as one of class' key responsibilities is to ensure that any regulation can be applied globally and consistently. Aiming towards this, class gets involved in the areas of adopting new regulations and related new equipment and systems. In addition, the certification of new age vessels will be one of the critical aspects when new fuels and technologies are developed.

He also stressed that IACS will be supporting IMO's de-sulfurisation and de-carbonisation initiatives and the various measures put forward for industry adoption towards emission reduction, such as -

- Technological – New ship designs, materials, engines & reduced resistance.
- Operational – Speed optimisation, efficiency improvement.
- Alternative fuels towards de-sulfurisation and de-carbonisation.

IACS will continue its collaboration with the

IMO, for example in its data collection system (DCS) where data will be integrated between the two organisations. As for GHG emissions, he said that we should expect to see a major movement in this area in 2019-2020.

"Ships need to get more efficient. As we move towards zero emissions, owners will need to invest in 'greener' ships by 2025 to reach the IMO's 2050 goal," he said.

IACS is the principal technical consultant to the IMO and each year the focus areas are determined. The focus areas for 2020 will be decided at the Council meeting to be held in December of this year, he explained.

Three years ago, IACS signed a Memorandum of Understanding (MoU) and Sharma said that this needed to be put on a more formal footing, ie forming a data driven policy. He said IACS intends to take this forward in the next couple of months.

## This could include -

- Embed data into IACS policy making processes.
- Underscore the importance of objectively justified, scientifically



enhanced positions.

- Provide policy makers and stakeholders with robust, detailed and well-argued technical support.

Sharma said that IACS would continue its continuous improvement programme as a quality organisation. In the drive to maintaining IACS as a badge of quality, there will be further enhancements to the Quality System Certification Scheme (QSCS) and the organisation will continue to work on the evolution of the International Quality Assessment Review Body (IQARB), while setting internal benchmarks amongst members for self improvement.

IQARB will consist of representatives from flag states, the IMO, the EU, insurance bodies and all stakeholders to make it truly independent.

He also wanted to see a commitment to transparency and industry engagement by a structured programme of engagement, ie obtaining mutually beneficial feedback and organising high-level policy meetings with shipbuilders, owners and marine insurers, thus reflecting industry concerns and aspirations in the IACS work programme. Progress should be shared with the industry to develop common

positions where possible. Sharma said he would like to extend the strategic horizon to six years to ensure consistency and continuity.

Perhaps he left one of the most important comments to almost last when he said that the human element training will be very important going forward. Those involved “must be well qualified,” he said.

An illustration of the work undertaken by IACS for the IMO concerning tankers is the organisation’s involvement to ensure that the 2011 International Code on the Enhanced Programme of Inspections During Surveys of Bulkers and Tankers (ESP Code) makes clear what is non-optional.

Explaining its relevance, Yuwei Cui, IACS Survey Panel Chairman, writing in the Annual Review, said that this Code replaces the ESP Guidelines, which was acknowledged for its great contribution to the promotion of tanker safety down the years.

IACS is deeply involved in fundamental work that takes place annually to keep the Code continuously updated and is working towards the Code’s alignment with the IACS Unified Requirements (UR). These have already been applied to tankers and bulkers classed with IACS members.

To ensure unified understanding and to facilitate global consistency to the Code’s implementation and practical application, a co-operative project was started between IACS and the IMO to align the Code with the UR’s most recently updated versions.

The most important task was identifying all mandatory requirements and amending the tables and focus based on the practical experience IACS had gained thus far.

Both parties soon realised that the non-mandatory language contained in the Code’s text inherited from the Guidelines needed to be further revised to clearly identify all the mandatory requirements. In addition, the tables and forms annexed to the various sections of the Code required further improvement to enable them to be more easily applied during surveys.

As a result, IACS submitted a series of co-sponsored papers to the IMO proposing amendments to the Code in an effort to prepare a draft consolidated version aligned with the URs. It is intended that this ESP Code draft be adopted as the 2019 consolidated version at the forthcoming IMO Assembly to be held between 25th November and 5th December this year.

The proposed draft includes the following



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amendments to the Code-

- Insert a preamble to introduce the Code's function and scope.
- Making amendments throughout the Code's text to use mandatory language.
- Incorporating all the footnotes containing substantive text in the preamble or in the Code's main body.
- Revising footnote identifying references to avoid the unnecessary burden of updating the Code's contents when adding or removing future footnotes.
- Introducing substantive hull survey requirements for ships subject to IACS Common Structural Rules (CSR) and IMO's Goal Based Standards, including the acceptance criteria for both general corrosion and pitting, edge and grooving corrosion of structures, the thickness measurement tables for CSR ships and the annexes to the CSR ship's evaluation reports, etc.
- Inserting new annexes of 'Procedural requirements for thickness measurements' for tankers.
- Inserting new requirements for Ship Construction Files and Coating Technology files.

- Amendments for addressing a number of term inconsistencies, such as 'cargo length area' and 'cargo area', etc.

### MSC viewpoint

At the IMO's Maritime Safety Committee (MSC) meeting held last December, it was agreed that the mandatory language should be used in the ESP Code. It was decided to move ahead with the amendments in two stages -

- 1) Adopt the amendments at the June, 2019 meeting which occurred.
- 2) Adopt the consolidated version at the 31st IMO Assembly this December, based on the draft consolidated Code proposed by IACS.

In addition, the draft amendments to SOLAS Chapter XI- 1 to make the consolidated version mandatory are expected to be adopted at the Spring 2020 MSC meeting. As a result, the expected entry into force date is 1st January, 2022.

Separately, IRClass was involved in two events during London International Shipping Week (LISW).

On the first day, a panel made up of some of the industry's decision makers, discussed key issues including the IMO's GHG goals and the

industry's expectations on the future role of class.

The UK's Rt Hon Nusrat Ghani MP, Parliamentary Under Secretary of State for Maritime, Department for Transport, remarked on the importance of classification societies in upholding standards and regulations in the maritime industry.

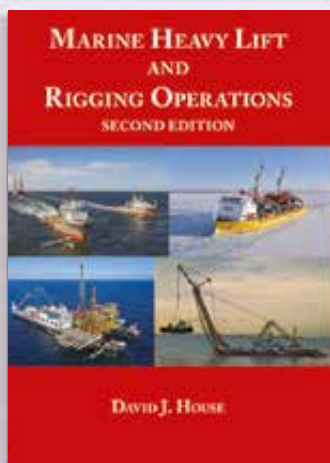
The second event was a seminar on the 'Future Role of Class – Partnering with the industry', which saw participation from a cross section of maritime stakeholders.

The changing role of class was discussed with the general consensus being that classification societies should partner with the industry towards compliance of international regulations.

Commenting on IRClass' events, Sharma, said: "This was the first time that IRClass held events during London International Shipping Week and we saw good attendance at both. The round table debate saw stimulating discussions with some very diverse and challenging views from senior decision makers representing different industry sectors and we received valuable feedback from our seminar on how class should evolve to provide more meaningful industry interaction."

TO

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# Digital Twin: a single source of truth in the asset lifecycle

**Central to the goal of safer operations and improved maintenance of marine assets is the continued development of technical approaches that provide a better understanding of the condition of the physical asset throughout its life.\***

**T**he complexity of modern, integrated marine assets combined with the natural uncertainty of the environments they operate in, provides a challenge in assessing their condition to help quantify reliability, which may lead to errors in judgement or prediction.

A digital twin offers a means to blend observed data with digital models and support diagnosis of current condition and prediction of future conditions. This provides decision-makers with a means to better understand asset reliability and make more informed decisions about their operations.

This represents the virtual representation of a physical asset, including its associated processes, systems and information. As the actual physical asset undergoes changes throughout its life due to degradation or other processes, the digital twin is continuously updated using the data collected.

Combining this collected data with analysis models, a digital twin can be used to diagnose properties that may not have been directly measured, simulate the asset's response to various prescribed scenarios, or predict future conditions and failure, based on forecast operations and the asset's specific integrity management plan.

Construction of a digital twin is primarily driven by the outcomes it is intended to achieve. When considering application for asset integrity management programs, this often leads to the independent development of separate digital twins for the hull structure and machinery systems, also known as a structural digital twin (SDT) and machinery digital twin (MDT).

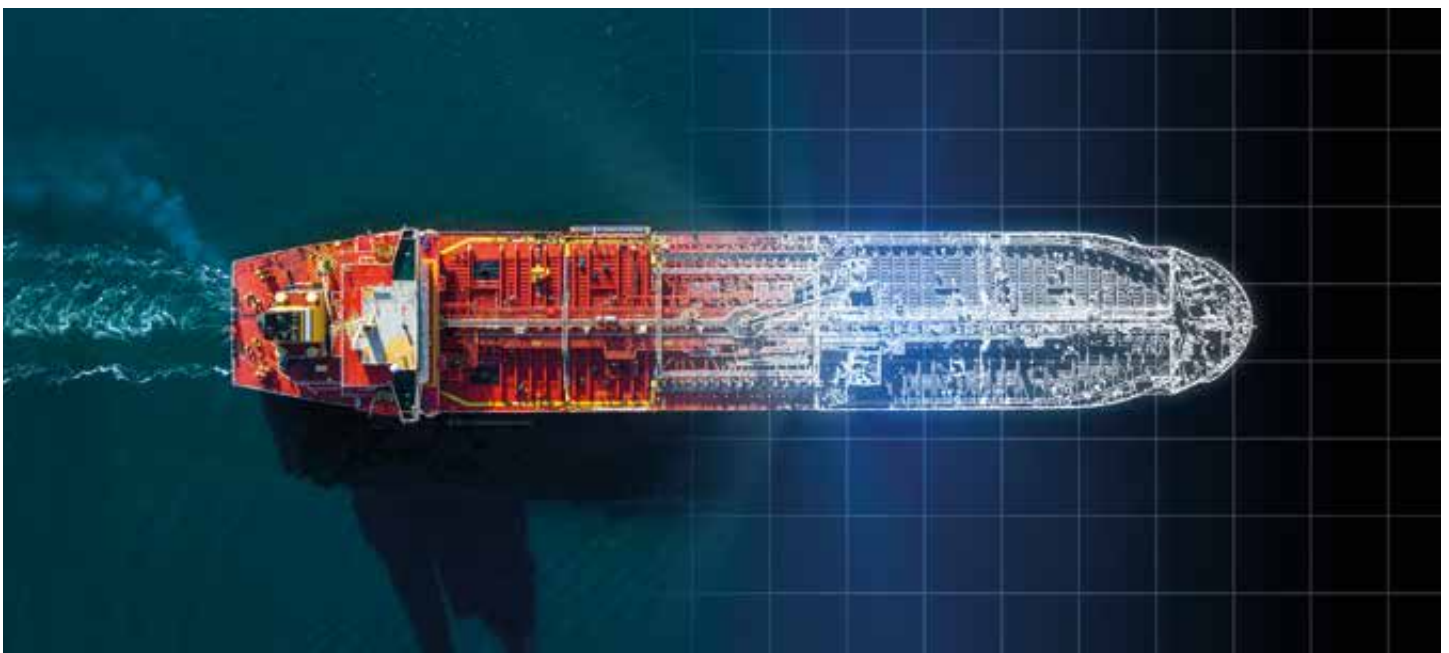
Vessel structural surveys are driven by international and statutory regulations or by classification rules, both containing prescriptive requirements to address interval



**ABS' Kashif Mahmood**

and scope.

Ships are typically required to survey their structural aspects on yearly intervals with a limited scope, with surveys of a larger and



**A tanker's digital twin**



more encompassing scope being carried out every five years. Drydocking is also required every two and a half years to allow a close inspection of the underwater hull.

Recognising the OPEX impacts associated with the above requirements, digital technology such as structural digital twins can help to optimise approaches towards meeting these requirements with as little downtime and cost as possible.

The goal for enhancing business conditions across the industry is to provide at least the same level of oversight through a less intrusive class experience by using a closer alignment with an owner's ongoing operation and integrity management activities.

Employing a structural digital twin as part of an integrity management programme can help provide greater insights into the condition of the asset and optimise inspection activities, support class-related decision-making and provide greater flexibility than traditional calendar-based surveys and their associated testing and examination requirements.

Approaches to optimise structural integrity management inspection plans rely on many different data sources and various analysis

models to support plan upkeep and decision-making.

The process is often very inefficient, relying on the manual transfer of data between different independent sources and analysis models. This type of siloed approach often results in scattered and conflicting information and calculations, creating inefficiencies which represent significant cost in both time and resources. It also leads to the most recent information not being readily available, creating uncertainty when faced with crucial decisions with further impacts on both risk and cost.

The structural digital twin can assist in addressing these challenges by acting as the 'single source of truth' for all stakeholders, managing the asset's load exposure and condition information obtained from inspections and/or sensors, feeding the current condition information to engineering analysis and analytics models, and finally generating the required outputs to guide operations, inspection and maintenance related decision-making.

For the structural digital twin to be truly effective, it must be fully integrated into the

integrity management workflow.

Extending the digitalisation solution outward from the digital twin results in the concept of a 'digital asset framework'. This framework describes the end-to-end workflow process for an integrity management programme; from the collection and management of data, to the engineering analysis and analytics models, the generation of actionable information in the form of automated alerts, structural condition awareness, operational guidance, and resulting inspection and maintenance tasks.

Sitting at the centre of this framework, connected to the rest of the integrity management workflow through a network of inter-connecting and interacting data sources, engineering analysis models, and resultant outputs and visualisations is the structural digital twin.

The framework is designed to be scalable and modular, so that new technologies can be easily incorporated throughout the asset's life without interrupting the integrity management workflow.

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*\*This article was written by Kashif Mahmood, ABS' Deputy Chief Digital Officer.*



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# ClassNK powers into the future

**ClassNK's Hayato Suga has given a progress report on the class rules to enable the safe use of LNG, hydrogen and other alternative energy sources.**

**A**s the conversation on alternative fuels continues to increase, ClassNK is focusing on updating its rules to ensure fast-emerging industry requirements meet safety imperatives, as well as the longer term research needed to reconcile vessel operations with shipping's lower-carbon future.

Today, LNG represents a central strand in ClassNK rule development, both as a cargo and as fuel. The global LNGC fleet currently comprises some 600 ships and is expanding. In Japan, the major yards, such as Mitsubishi, Japan Marine United (JMU) and Kawasaki are working on newbuildings, while their South Korean and Chinese counterparts have an expanding orderbook.

However, what this aggregate statistic doesn't reveal is a structural shift in the fleet.

Traditionally, LNGCs were placed on long-standing charters to support projects between a major energy supplier and set customers. Recently, however, new players are joining the market to satisfy emerging demand in small-scale LNG distribution to pockets of stranded demand and in bunkering LNG as a marine fuel. As these new entrants typically have less experience than established carrier operators, rule development and the spreading of best practice are more important than ever.

Last year, ClassNK released the revised 'Guidelines for Liquefied Gas Carrier Structures', considering specifically the case of independent prismatic tanks. The amended text describes the technical requirements for direct strength analysis (DSA) and for fatigue assessments.

DSA specifies a method for calculating yield strength and buckling strength based on net scantling of primary structural members, drawing from in-depth research and experience from other vessel types. The document also presents assessment methods taking account of the complex interaction of loads between hull structures and cargo tanks which are independent of each other.

The Guidelines specify not only the design loads dominant for each structure, strength analysis methods and corrosion deductions, but

also the design scenarios in which assessments are required by the IMO IGC Code, therefore covering all structural requirements for gas carriers with independent prismatic tanks.

The updated guidance outlines strength assessment methods against fatigue cracks caused to vessels by prolonged and repeated loads. The original guidelines assumed some very conservative starting conditions, which resulted in what is now assessed to be excessively cautious fatigue life predictions.

Using data on the conditions these vessels encounter in actual operation, ClassNK was able to refine the starting assumptions, which led to a more precise calculation methodology for both hull structure and independent cargo tanks and their associated support structures.

Of course, field data has to be treated with caution and supported by fundamental research, as it is based on the conditions met during normal safe operation and not behaviour in more extreme circumstances.

## Alternative fuels

Looking further ahead, it is essential to comply with IMO's agenda to reduce international shipping's dependency on fossil fuel, as part of a wider environmental commitment to halve greenhouse gases by 2050. As the shipping industry moves to cleaner modes of operation, shipowners are showing greater than ever interest in LNG as a fuel.

As an example, ClassNK granted an Approval in Principle (AIP) to the design of an

LNG-fuelled 200,000 dwt bulk carrier jointly developed by NYK Line and JMU in July, 2018, to Kawasaki Heavy Industries (KHI) for a concept design of an LNG-fuelled 207,000 dwt bulk carrier in January, 2019, and to Sanoyas Shipbuilding Corp for a concept design of an LNG-fuelled wood chip carrier in May, 2019.

Despite the additional weight of the LNG fuel tanks and fuel supply systems, these ships have a larger cargo hold capacity and, by running on LNG, they are expected to satisfy Phase 3 of IMO's Energy Efficient Design Index (EEDI).

Other than LNG, alternative fuels such as LPG and methyl/ethyl alcohol are also considered to be a viable option for ships. These alternative fuels have lower flashpoints compared to traditional fuels; therefore particular attention needs to be given to ensuring adequate safety precautions when using low-flashpoint fuels in order to decrease the potential risk of fire and explosions that may arise as a result of fuel leakage on board the ship.

International safety requirements for low-flashpoint fuels have been discussed at IMO and as a result, the International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code) has been adopted and enforced. However, the current code does not address specific regulations for alternative fuels other than LNG.

To promote the design of alternative fuelled ships, ClassNK released the 'Guidelines for Ships Using Low-Flashpoint Fuels (Methyl/Ethyl Alcohol / LPG)', which outline safety requirements for other viable alternative fuels besides LNG, based on the latest technology and regulation trends.

These guidelines divide targeted vessels into three categories - ships using methyl/ethyl alcohol as fuel; ships fuelled by LPG; and liquid gas carriers fuelled by LPG. They take into consideration the properties of each fuel type and ship regulations and indicate safety requirements for the arrangement and installation of the low-flashpoint fuel related systems for minimising risks to vessels, crew, and the environment.

Fuel methanation has also gathered global attention as a method of technology that may greatly contribute to the reduction of GHG



**ClassNK's Hayato Suga**





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## INDUSTRY- CLASSIFICATION SOCIETIES

emissions. ClassNK currently participates in a working group for the reduction of CO<sub>2</sub> emissions by use of methane synthesised through methanation technology, which combines CO<sub>2</sub> and hydrogen produced from renewable energy sources. The technology is still relatively new, but if methanation proves to yield positive results in the long run, the supply of synthesised methane may greatly increase, as it comes into widespread use.

### Next generation

As a low carbon energy source, hydrogen is stirring up excitement as a promising alternative to conventional fuels, as the only waste product discharged at the time of power generation is water. Hydrogen can be burnt directly, like HFO, or used indirectly to power fuel-cells. In marine applications, the latter option is gaining traction as the technology is proven and efficiency is improving as manufacturers develop and refine the technology.

Hydrogen-powered fuel-cells could reach a theoretical efficiency as high as 80%. However, it should be remembered that hydrogen is a fuel carrier and its overall environment footprint depends on how cleanly it is produced and transported to where it is needed. The benefits diminish if fossil fuels power the production process. The dynamics become more interesting, however, if renewable energy sources are employed and a lot of practical research and activity is going on in this area.

Today hydrogen remains more expensive than conventional fuels, but the consensus is that costs will fall as production processes are refined and scaled up in response to growing demand, not just from shipping but more widely across industry. Therefore, in addition to economically viable and environmentally-friendly methods of production, a secure supply chain will be required to transport hydrogen to where it is needed. In common with existing fuels, ships are likely to be the most efficient method for transporting large volumes over long distances.

The technology behind the storage and transfer of bulk liquefied hydrogen is not new, with land- and barge-based facilities supporting the space industry being in place since the 1950s. The same technology and standards can be applied to carriage by sea, albeit with modifications to suit shipborne operations.

Currently, the IGC Code outlines safety requirements for gas carriers like LNG. However, there are no specific requirements defined in the code applicable for liquid hydrogen carriers that take account of the hazards associated with its handling and transport.

Hydrogen must be kept at temperatures below -253 deg C in order to maintain its liquid state under atmospheric pressure, presenting an even tougher challenge than LNG. In response to growing interest in LH<sub>2</sub> transportation, IMO developed 'Interim Recommendations for Carriage of Liquefied Hydrogen in Bulk' – based on proposals from Japan and Australia and subsequent follow up by a specially convened correspondence group. These proposals were adopted at MSC 97.

Using its wealth of technical expertise and extensive experience in gas carrier R&D and ship classification, ClassNK has taken this work further by developing 'Guidelines for Liquid Hydrogen Carriers' based on these interim recommendations and other related international standards. These guidelines set out the safety requirements, which must be met in the design and construction of such ships to address the hazards arising from the handling of liquid hydrogen.

It should be noted there are some areas where the behaviour of the cargo cannot be determined with absolute certainty. Seaborne trials will be needed to resolve this to derive the data needed to refine the requirements and develop processes necessary to support large scale commercial shipments.

In 2020-2021, the world's first project for producing and transporting clean hydrogen from Australia to Japan will begin, and ClassNK will join the project to evaluate the safety of liquefied hydrogen carriers from the perspective of a classification society.

TO



# Ardmore speaks out

As an example of a leading tanker owner with both chemical and product tankers in its fleet, Irish-based Ardmore Shipping spoke with *Tanker Operator* on a wide range of issues.

**S**tarting with the company's chartering policy, CCO Gernot Ruppelt explained that since Ardmore was founded, it has been involved in the full spectrum of charter options.

These include fixed rate timecharters to top quality charterers, both short and long, bespoke chartering solutions with various floating components, and selective charters, as well as pooling and commercial management, and of course, direct spot trading.

"We have significantly grown our spot market presence over the past four years, and our fleet trades globally in our recently established Ardmore in-house pool in close co-ordination between our commercial offices in Singapore, Houston and Cork," he explained.

Answering the question - why enter a pool? Ruppelt said, "It really depends on the circumstances. Any shipowner contemplating entering a pool should consider what makes sense given the pool's trading and cargo footprint, employment strategy, fleet portfolio and pool participants.

"Am I, and is my, specific vessel a good fit here?" is the question that needs asking as the decision goes well beyond 'pool formula' alone," he said.

He explained that there are strategic, organisational and overhead considerations for a potential participant, and, as far as the pool is concerned, it would be important to have transparency on earnings distributions and working capital management, as well as pool points across vessel classes, but very much also internal policing of standards, reporting, compliance and in short, pool governance – all

these factors play a role and vary across pools.

He said that Ardmore had participated in a small number of different pools and commercial managers since it was founded, as it aligned well with either the employment strategy or the vessels in question at the time.

"Mostly, we had very positive experiences with our partners and can fully appreciate the mutual benefits of pool participation. As we have started to grow our in-house capabilities, we have started to rely less on third party managers which has been a natural progression over time.

"However, while many aspects of trading and operating our fleet are in-house now, we still rely on a number of strategic external relationships. For instance, in bunker procurement, we work closely with Teekay Fuel Services and the Netherlands-based bunker co-operative Bebek.

As for the vessel's technical management, COO Mark Cameron, said that the company has a combination approach whereby it has a joint venture with Anglo-Eastern (Anglo Ardmore Ship Management Limited) and in addition Ardmore uses Thome Ship Management.

"We think this hybrid approach works very well for us, as well as our service

partners who both completely understand our operational and leadership philosophy, which has been forged over a number of years working together through problems and successes alike," he said.

Explaining the difference and synergies between chemical and product tanker trades, Ruppelt said that to some extent, the trades are insulated from each other, due to difference in physical cargo handling requirements, but also related to stem size and certain commercial and operational patterns.

## Substantial overlap

There can also be a substantial overlap depending on either market forces or positioning opportunities whereby normally more product-oriented tonnage trade into easy chemicals or edible oils, and vice versa.

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Ardmore's MR 'Ardmore Seaventure'

Ruppelt talked about the stainless steel chemical tanker sector saying that it is very different and certainly more costly to enter and operate in. Unfortunately, it does not necessarily produce better returns. Cargo base, business model and employment vary greatly.

“We are more focused on the larger commodity chemical segment which we believe offers more value, all things considered, which has also introduced interesting cross-trading opportunities for us,” he explained.

Turning to finance or the lack of it, CFO Paul Tivnan told *Tanker Operator* that as a leading tanker company listed on the NYSE and with a very strong reputation, Ardmore continues to have access to top-tier financing.

“Fortunately, we don’t rely on just one source of finance and we have a healthy mix of debt and equity financing. As of June, 2019, Ardmore’s has approximately \$450 mill in debt and capital leases spread across top-tier banks and financiers in Europe, Japan and China.

“Also, as a listed company access to public equity is an important source of finance for Ardmore; and since 2013, we have raised over \$300 mill in equity from investors for growth. We keep a close relationship with our investors and work hard to maintain their trust and to

deliver long term value for our shareholders,” he said.

As for the future, Cameron said; “We are always evaluating growth opportunities. Over the past nine years, our track record demonstrates patience and deliberate moves that make accretive sense to our financial, operational and commercial platform.

“Each deal that we evaluate has to stand on its own two feet. Allocation of capital is subject to rigorous supporting technical analysis combined with a healthy dose of perhaps more subjective intuition, which requires you to be very closely plugged in to your markets.

“We are always therefore looking at adjacent sectors and considering context relative what we know more intimately through first-hand experience. Temper this against what we consider has always been a successful investor strategy in keeping our business focused and streamlined in terms of the sectors we are in,” he said.

Ardmore is also an advocate of joining think tanks and lobbying bodies, such as IPTA.

Cameron explained that Ardmore is operating in a legislative environment that has morphed from a more technical and operational focus into a more political agenda, driven by a much

bigger global influence.

MARPOL has moved from sea pollution to air pollution and greenhouse gas emissions, so there are no more days of operating as an industry in global ‘isolation’.

“We are now dealing with a much bigger and wider-reaching agenda and as an industry, we need to be geared towards taking a more collaborative approach, whilst also having our specific sector interests heard among the myriad of voices that are looking at the same issues through different lenses.

“IPTA and other bodies that we are part of and contribute to are important mechanisms for dealing with change, especially by injecting a large degree of practicality into developing solutions.

“We are also well represented through INTERTANKO, which addresses a wide array of factors as a whole and also, through the Commercial & Markets Committee (which is chaired by Gernot Ruppelt, our Chief Commercial Officer), we are prioritising industry payment performance (or rather delays), commercial matters around bunkering and liaising with other industry bodies such as the WS Association,” he said.

TO

## Tikka joins Ardmore

Former ABS guru, Dr Kirsi Tikka has joined Ardmore’s Board of Directors.

She has had over 30 years of shipping experience having retired from the American Bureau of Shipping (ABS) in July, 2019.

Dr Tikka joined ABS in 2001 and held various specialist and leadership positions within the class society, including as ABS Executive Vice President Global Marine, Europe Division President, and as Vice President and Chief Engineer, Global.

Her most recent ABS role was as Executive Vice President, Senior Maritime Advisor, where she was responsible for aligning ABS strategic planning, client development, and product and service offerings with the industry’s technical needs and requirements.

Anthony Gurnee, President and CEO of Ardmore Shipping, commented: “We are delighted to have Dr Kirsi Tikka join Ardmore’s Board of Directors. In addition to her considerable general experience in shipping operations and technical matters, her deep knowledge of the industry’s regulatory framework and trends, including sustainability initiatives, will be of great value to Ardmore as we navigate the compliance challenges ahead.”

On her appointment Dr Tikka said: “I have long admired Ardmore Shipping as a leading owner and operator in the MR product and chemical tanker sector and it is a pleasure to join its Board of Directors.

“It is no secret that the industry faces an array of operational, technological and regulatory challenges, today and in the years ahead, and I look forward to drawing on my knowledge and experience to help further strengthen Ardmore’s industry-leading

standards of performance,” she said.

From 1996 to 2001, Dr Tikka was a professor of Naval Architecture at the Webb Institute in New York, where she was also awarded an honorary doctorate in 2018. In addition to teaching, she carried out research on tanker structural strength and risk analysis, as well as being actively involved in the US National Research Council Marine Board studies on double hull tankers. She also worked for Chevron Shipping in San Francisco and Wärtsilä Shipyards in Finland.

Dr Tikka holds a Doctorate in Naval Architecture and Offshore Engineering from the University of California, Berkeley, and a Master’s degree in Mechanical Engineering and Naval Architecture from the University of Technology in Helsinki.

She is a Fellow of both the Society of Naval Architects and Marine Engineers (SNAME) and the Royal Institution of Naval Architects (RINA).

She is also a director on the board of Pacific Basin Shipping and is currently a Foreign Member of the US National Academy of Engineering and a member of the UK Women in Maritime Task.



Dr Kirsi Tikka

# Satcoms evolving at an ever increasing pace

The move to fit VSAT is underway at an unprecedented pace, according to KVH's Executive Vice President for Mobile Connectivity, Mark Woodhead.

**F**or example, this year VSAT take up is more than double that of two years ago at the same stage.

This increase has been driven by fast data speeds, which are now essential and an always on service, as uninterrupted connectivity is also now required. Some of the considerable number of vessels using Inmarsat's L-Band system are now migrating over to VSAT systems, which KVH has taken advantage of, he said.

Faster speeds are now possible through high throughput satellite (HTS) technology of up to 20 Mbps. KVH, through its tie up with Intelsat, has access to over 16 satellites and for

redundancy, vessels can have access to at least two beams, enabling an instant switch should one satellite not be in range, or not linked up.

Much of KVH's success can be traced back to the introduction of the company's patented AgilePlan, whereby a customer receives a bundled service for a monthly fee with the commitment to a long term contract, thus reducing a customer's capital expenditure.

This service includes free antenna shipment and installation. Around two years ago, KVH would involve around 60 ports worldwide for installations but this has since risen to around 4,000 where company trained engineers can fit the equipment. Round-the-clock support is also

available.

Illustrating the growth of VSAT, Woodhead said that during the fourth quarter of this year, the company will have shipped its 10,000th system and figures produced for the second quarter showed that 70% of sales came with an AgilePlan.

One of the main drivers for the increased connectivity is seafarer use, where "content is king", Woodhead said. As is more and more the case today, as well as negotiating pay and conditions, a seafarer will demand access to instant communications, which has led to the 'always on' type service becoming popular on board ship.

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KVH is heavily involved in multi-media content offerings and today it is very much part of the logistics of the service offered. For example, KVH has what it calls IP-MobileCast for downloads of multi-media services and LinkHUB for vessels not fitted with a KVH VSAT terminal. Cyber-security makes the content delivery method more important than ever, Woodhead explained.

The company has also introduced the patented KVH YOURlink, by which shipowners and operators can become media owners by taking information assembled from the shoreside office and send it to the shipboard crew in audio, video or other multi-media methods. The system will process, take-in and distribute the feed to a ship or fleet.

### **‘Smart’ shipping**

KVH has also looked at how the Internet of Things will enhance so called ‘Smart’ shipping. Here connectivity will make IoT work on board to enhance ship operations, such as performance management and condition monitoring via digital technologies.

Designed for fleet managers, vessel performance optimisation can be achieved by taking advantage of two channels available through the antennas on board - a high speed through HTS channel and unlimited use channel, which doesn’t necessarily have to be on 24/7. For example, ECDIS updates and weather downloads can be undertaken through the high speed channel.

In addition, a remote monitoring and intervention system - KVH Watch - consisting of Watch Flow and Watch Intervention - was introduced a couple of months ago. This is a maritime Internet of Things (IoT) connectivity solution for maritime equipment manufacturers and application providers to enable manufacturers to conduct remote monitoring and real-time intervention to minimise expensive service calls and ensure that the equipment is performing at its peak.

As an example, Woodhead said that the company knows how each antenna is performing and have KPIs on the best and worst performers. During the last quarter, there were around 1,000 performance changes undertaken. “Why don’t other equipment manufacturers have a similar system,” he queried.

To enable other equipment manufacturers to take advantage of the connectivity on offer, the company has taken the AgilePlan a step further on board ship. Woodhead explained that warranty claims become much easier to handle when data is available. Watch Flow is aimed at always on monitoring while Watch Intervention can identify problems on a hourly



**KVH's Mark Woodhead**

basis to support the ships’ crew.

KVH is providing IT connectivity to the Kongsberg’s Kognifai Vessel Insight platform and a pilot programme on board a research vessel was due to start last month.

More collaboration is possible in the future, Woodhead explained, illustrating the point by saying that the company had joined the Smart Maritime Network (SMN) as a founding member of Tech Development Initiative dedicated to supporting collaboration and standardisation in the development of IT systems for the shipping sector.

As a founding member, KVH will participate in SMN’s council meetings with maritime technology developers, systems integrators, and vessel operators to discuss issues relating to the compatibility, standardisation, and harmonisation of the technology used in the modern shipping industry.

### **Certus tie up**

In another move, KVH recently announced that the patented Iridium Certus service is now available as a companion for KVH’s TracPhone mini-VSAT Broadband systems. Iridium Certus is an L-band solution providing pole-to-pole global coverage and featuring small-form-factor, cost-effective antenna terminals. KVH’s VSAT systems also include the TracPhone HTS-series, which provide data speeds as fast as 20/3 Mbps (down/up).

This companion solution, featuring Iridium’s highest L-band data speeds of 352/176 Kbps (down/up) and the 38 cm diameter Cobham Sailor 4300 antenna, is designed to integrate with all KVH TracPhone mini-VSAT Broadband antenna systems.

Optional least-cost routing enables on board data to switch from KVH mini-VSAT

Broadband service to Iridium Certus and back again, as necessary. An unlimited use data plan is available, whether the vessel is using KVH mini-VSAT Broadband or Iridium Certus.

### **Iridium MoU**

As for Iridium, the satellite concern has signed a Memorandum of Understanding (MoU) with OneWeb to work together toward a combined service offering. This offering would be designed to make it easier for their mutual partners to offer unique bundling and co-marketing opportunities for the Iridium Certus L-band services and OneWeb’s Ku-band service, leverage the strengths of their respective low-Earth-orbit (LEO) networks.

This is claimed to be the first time that LEO operators have collaborated to deliver services in L-band and Ku-band.

The MoU also creates opportunities for companies that manufacture both OneWeb and Iridium Certus terminals. Such new options could include Iridium-OneWeb companion packages in addition to providers being able to offer combined equipment or even new dual-constellation terminals.

“It’s an exciting time for the industry, and we see great potential for this offering,” said Matt Desch, Iridium CEO. “Our services are unique and complementary, and we know that customers are looking for the capabilities of both our low-Earth-orbiting networks.”

Adrian Steckel, OneWeb CEO, added: “We believe our new offering can bring many benefits for our distribution partners. By combining the strengths of our services, we can ensure our partners are able to deliver the most innovative, seamless services to their subscribers across many markets, and in all the places that don’t yet have access to the internet.”

TU

# Shaft repairs - Science or art?

**Danish-equipment repairer MarineShaft recently carried out cold straightening of a propeller shaft, intermediate shaft and OD shaft on Prime Marine Management's LR1 'Arctic Flounder'.**

**T**he bend of the propeller shaft was around 2.5 mm.

When necessary, the company told *Tanker Operator* that it will send a service engineer on site to carry out the alignment tests for customers.

In the tanker's case, the run-out measurements were handled in co-operation with the vessel's owner and the Greek shipyard where the tanker was docked, and with the drawings, MarineShaft could render a repair solution/quotation.

During the operation, Prime Marine's Emmanouil I Kyriakos came to MarineShaft's premises in Hirtshals to inspect the repair and when asked of his impression he said that it had been a unique experience.

Straightening a bent shaft without using any heating and furthermore with full class approval was quite an accomplishment, the company claimed.

For more than 50 years MarineShaft has been involved in cold straightening propeller shafts and rudder stocks. The company's hydraulic press is the focal point of its success, it claimed. It is also based on very skilled and committed employees with a high work ethic and teamwork.

Managing director, Knud Andersen said, when asked about the straightening technique: "Operating these powerful



machines is not something you can learn from a book. Our straightening engineers have all learned the straightening technique from older and former employees – passing their knowledge on to the next generation."

He knows about cold straightening, as he started his career in the workshop as an apprentice learning the technique from his father, who was the straightening pioneer.

Today, MarineShaft has several hydraulic presses located at the company's three workshops in Hirtshals, which have the capacity to carry out urgent repairs.

The main hydraulic press has a capacity of 3,500 tonnes and has been used to its full press capacity, when straightening a shaft with a diameter of almost Ø1,000 mm.

This experience made MarineShaft decide to be future-ready and design and build an even bigger hydraulic press, which was installed a few years ago. Designed and built by the company, the capacity of this

new hydraulic press is 6,000 tonnes and it is able to handle shafts with a diameter up to 1.5 m.

After straightening, the deflection of a shaft is maximum 0.05 mm - same as the thickness as a hair, the company claimed.

Even a minor bend on a propeller shaft can cause vibration and damage to a vessel. MarineShaft has straightened propeller shafts with large bends of up to 1 m out of line, but often the bends are minor and not visible to the human eye.



## Short delivery time

A shaft can be straightened within 48 hours – depending on the size of the shaft and the damage. The delivery time is a big cost saver to the vessel owner and is one of the reasons why shafts are sent to MarineShaft's workshop in Denmark from all over the world, as the delivery time for manufacturing a new shaft can be very long.

However, when it comes to new equipment manufacturing, MarineShaft is also among the best suppliers.

A huge stock of material is stored outside the workshop ready to be taken into the workshop for machining.

MarineShaft keeps materials in long lengths up to 18,000 m, thus enabling to meet any request from a vessel owner.



# Lubrication matters!

**We are now out of the five-year coverage of the US Environmental Protection Agency's Vessel General Permit (VGP) 2013 and well into the first year of the US VIDA (Vessel Incidental Discharge Act).\***

**N**othing much has changed, as the VGP 2013 is still in operation, until December, 2020, by which time the EPA will be required to develop national standards of performance for around 30 discharges [similar to the discharges in the EPA VGP 2013].

What has changed for the worse is the use of Environmentally Acceptable Lubricants (EALs). Since the wider adoption of EALs in 2014, it is evident that some are failing to perform, causing stern tube bearing and seal damage and loss of the vessel's operational availability.

At the beginning of that year, owners didn't know which EALs they must use, they just knew they were more expensive than mineral oil. In addition, OEMs didn't know how they would perform – compared with mineral oil.

In the mid-2014 concerns were being raised about several 'failures' of stern tube bearings in newbuildings during sea trials – citing misalignment issues after investigations.

Recently, EALs were shown to be failing after only 2~2 ½ years in use and class society investigations into the operational performance of some EALs under higher specific stern tube bearing pressures (typically due to slow steaming operation with larger, heavier propellers) showed that they 'generally' exhibit a lower viscosity – and hence, a lower lubricant film thickness – than mineral oil.

This has led to at least one class society changing their design rules for shipbuilders, to use a higher viscosity than the normally designed viscosity of mineral oil.

## Current situation

There are five types of base oils that are 'generally' accepted as being biodegradable - Vegetable oils, Polyalphaolefins, Polyglycols and Synthetic Esters, of which there are two types - the weaker unsaturated esters and the robust fully saturated esters.

There are also 'blends' of these base oils, used to have the cheapest base oil and adding just enough of another base oil to improve viscosity and biodegradability, to try to offer



**Greenmarine's Phil Cumberlidge**

the lowest market price.

OEMs are still listing EALs that have shown to 'fail' on several equipment, stating that the EAL was 'compatible with the sealing materials on their test bench', which can be vastly different to what is happening in a stern tube with a huge propeller shaft moving around, in heavy seas.

What 'failures' are occurring with some of the EALs?

Lubricant issues have become evident with some EAL types, such as: increasing oil viscosity – due to poor thermal stability, decreasing oil viscosity – due to shear instability, varnish and gumming of the system – due to thermal degradation, difficult filterability and difficulty in change-over from mineral oils due to immiscibility of the EAL with mineral oil and instances of slime and bad smells in stern tubes - due to water contamination, bacterial growth and oxidation.

Other, more serious issues, such as - corrosion of equipment internals, due to the hygroscopic nature of the lubricant; overheating of seals, due to increasing lubricant viscosity/viscous shear and bearing wear in propulsion systems, questioning oil film thickness and frictional characteristics.

Another myth is that the high performance EALs cost more than mineral oil – per litre,

they do..... through life..... they don't!

So how can an owner avoid making a wrong choice of EAL?

Lubricant reliability and long-life come from the combined high performance of the base oil and the additives selected and are the sum of:

- Stability of the base oil viscosity and shear – with no need for viscosity improvers that can be broken-down.
- Resistance to ageing - oxidation and thermal stress – not depositing varnish, or gumming.
- Stability of the dispersion of the additives and not separating, or being filtered-out.
- Compatibility with seals, metals and protective coatings, to not cause component degradation, failure or corrosion.
- Stability with contaminants – other oils and water – to not cause emulsions that cannot readily separate the water, that can lead to corrosion, bacterial growth and bad smells.

To avoid making disastrous choices for all oil-to-sea interfaces on their vessels, owners should talk with the EAL makers and ask them directly....what references they have and if their lubricants have been replaced by other EALs? Owners should also, as the US EPA recommends, ask the makers what environmental 'labels' they have. In addition, ask what class society accreditations they have.

Currently, fully Saturated Synthetic Esters are leading the way in reliable, high performance and long-life marine lubricants; with the benefits of being environmentally considerate and reducing a vessel's carbon footprint.

Documented monitoring of 'real-life' use of PANOLIN Saturated Synthetic Esters showed that up to 10 times the life of mineral oils can be achieved, providing lower through-life lubricant costs.

*\*This article was written by Phil Cumberlidge, Business Development Manager – GREENMARINE. PANOLIN INTERNATIONAL.*



# Smart tankers need smart crew

**Tankers are some of the most advanced vessels at sea and operate to a higher set of standards.\***

**W**ith the impact of new technologies being felt across the whole maritime sector, and the drive towards digitalisation in full throttle, it has never been more important to ensure that you have the right crew on board.

Smart systems are transforming vessel operations, making them more efficient, cost effective and more environmentally friendly. Widescale data transfer from vessels enables increasing amounts of operational monitoring and transparency. Of course, this higher level of operation is only achievable if those systems are operated in the correct way – meaning crew need to be carefully selected and trained.

To adapt to the new smart systems, we need people who are able to adjust to, and cope with, changes. In turn, this means that a certain IQ is required as well open mindedness.

I have heard it said that smart ships require different skillsets for seafarers. I think they require additional skillsets. Despite all the new technology on board, which will give better tools for prediction of future events, planning and risk mitigation, ships will still be exposed to situations, such as unforeseeable weather conditions.

Ships will still have relatively complex technical equipment on board, meaning that damage and break-downs will continue to occur and we will need crew with the practical, hands-on experience to deal with issues like a cracked liner.

However, with control systems becoming more complex and the integration of automated decision making, we also need seafarers who are able to validate data. This requires experience but also a high-degree of situational awareness and good powers of perception.

Ironically, today's shipping industry requires seafarers who demonstrate a high ability of intuitive thinking and yet, conversely, are willing to comply with strictly enforced procedures and standards.

Social skills are also of great importance

in the modern maritime world. Smart seafarers have to co-operate with colleagues from different professional backgrounds, as well as having the ability to interrelate with shore operation centres.

In addition, shore-based ship control centres are increasingly being manned by nautical, engineering and commercial experts overseeing the performance of a fleet, meaning seafarers need to be confident when communicating at a senior level.

## Smart screening

To find smart crew for smart ships, we need to step up the screening of candidates.

In addition to checking skills and knowledge by examining certificates and experience, crew screening for today's seafarers should take a much more holistic approach.

Smart screening must include IQ and psychometric tests. The challenge here is to select a test with a documented high correlation between test results and actual performance. Unfortunately, there is no such test for senior officers, so we need to use tests which are proven in other similar work situations.



Danica Crewing Services' Henrik Jensen.

No test is 100% proof and the staff responsible for the screening will also need to be trained in interview techniques to enable them to verify the results.

Today, many shipping companies are using multiple sources for their crew involving several manning agencies, which makes it complicated to implement and operate a sophisticated screening process.

I predict a consolidation of crew sources and a move to employing manning partners who have the knowledge and ability to manage such enhanced screening regimes.

## Smart training

Smart screening generates its own problems. The higher requirements can narrow the field of candidates able to fulfill them. Consequently, this can lead to staff shortage and shipping companies may have to consider candidates who do not completely fulfill the original criteria – instead providing additional training to help candidates meet the requirements.

In addition, the smart recruits will need ongoing training to continue to operate the latest technology and smart systems.

I anticipate shipping companies will provide more training to seafarers in coming years – smart seafarers are an asset and investment that sensible companies will wish to retain. Working conditions and remuneration may well become a factor, as smart seafarers recognise the value of their smart skills and expect them to be recognised.

The good thing is that, although things are changing fast, it is not a revolution or something disruptive, but rather it is an evolution.

For the majority of shipping companies the introduction of smart ships needing smart crew will happen gradually, thereby giving everyone time to adapt – but we need to start the preparations now!

*\*This article was written by Danica Crewing Services' Henrik Jensen.*

# A growing digital divide

When it comes to the issue of digitising supply chains, the shipping industry can often fall victim to hyperbole. \*

**S**o much talk is of the ‘disruption’ of shipping and the rush toward autonomous shipping. This is interesting conversation, of course, but if we listen closely, it is clear there is more sensationalism than substance in how we are dealing with the inevitable trend toward digitisation in shipping.

The truth is that, today, there is a significant chasm between our digital capabilities and our digital reality. To get to a point where we are truly digitalised and integrated, it is important that the digitalisation of shipping is understood as an all-encompassing project.

What shipowners and operators - and every supply chain partner - needs is more realism, more rationalisation and more carefully planned, pragmatic solutions and strategising for a digitalised and integrated future. Digitalisation must seamlessly bind ship to shore; but to reach this point, we need to get the fundamentals right first.

## Falling out-of-step

The problem faced by many tanker owners and operators right now is that the significant savings delivered through expensive digitalised and automated systems on board are often lost the moment the vessel arrives in port.

Making sure the ship agent has equally sophisticated digital capabilities is vital. Yet, many ship agency businesses still operate using a wide range of disparate and diverse IT software solutions and tools, most of which were not designed to meet the practical needs of the shipping supply chain. There is also a significant proportion of administrative work that occurs offline, in hard-copy.

But this does not have to be the case. Twenty or so years ago incorporating integrated technology into business was only the prerogative of the very large shipping companies with significant financial resource. Today, however,



**Softship's Lars Fischer**

simple online platforms can now offer the same level of support, the same functionality and processes as an intranet-based software package, which can only be used on networked computers within an office.

## Greater agency in port

These new cloud-based systems such as Softship.SAPAS, a software solution designed specifically for port agents, allow their users to perform all their administrative requirements from a phone, tablet, laptop or desktop.

It is this ability to work with complete transparency and in real-time that is going to be a pre-requisite for the further development of a digital maritime economy. Utilising built-for-purpose, web-based solutions exclusively designed for the shipping industry means that companies of any size can compete now, and in future.

This is particularly important for tanker owners and operators who rely upon vast networks of often small ship regional ship agency businesses worldwide. With the right software solutions, these very experienced agents can have the same administrative tools at their disposal to perform as effectively as the major players and can demonstrate the tangible efficiency savings that they can provide as a service provider.

With Softship.SAPAS, for example, the financial status of the port call can be monitored in real-time and information about crew changes

or Statement of Facts are easily shared. This will reduce time and costs in port. And this is an important point – the digital evolution of shipping does not have to be ‘disruptive’, in its traditional sense, or troublesome.

Taking the time to get the basics right in digitalising the connections between vessels, ports and agents is critical to ensuring that meaningful change occurs, and that the conditions are right for our approach toward ‘Maritime 4.0’.

*\*This article was written by Lars Fischer, Managing Director, Softship Data Processing Singapore.*



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## Softship

Softship is part of the WiseTech Global Group and is a provider of software solutions to the international shipping industry and port agency sector. Its products serve more than 120 companies globally and are designed to streamline tasks and processes in order to deliver greater efficiencies.

In addition, the company provides a range of business management tools that allow shipping executives to fully analyse their commercial and operational activities.

Founded in 1989 and headquartered in Hamburg, Germany, Softship employs more than 130 industry experts across a global network, with offices in Singapore, the Philippines and the US.

# Machine learning the key to efficiency

In this article, GreenSteam outlines the advantages of machine learning for greater efficiency.

**G**reenSteam is headquartered in Copenhagen has had a lot of contact with the Danish market, but also has clients in Europe, the Nordics and Asia. The company told *Tanker Operator* that it had close ties with the tanker market, as it is majority-owned by BP.

Key to survival when operating costs are increasing, margins are getting tighter, and competition is becoming fierce, is to become more fuel efficient.

Not only will fuel efficiency cut costs, but it can also benefit the environment. The IMO claims that shipping emissions could grow by between 50% and 250% by 2050, which is another reason for operators to adopt fuel efficiency practices.

A dramatic move away from shipping's usage of HFO is deemed essential by industry leaders, environmentalists and lawmakers alike – as the changeover date of 1st January, 2020 fast approaches.

An exact fleet fuel procurement strategy is essential for optimising the efficiency and economics of each ship, as well as ensuring all vessels are compliant with the new legislation.

Those pursuing data-driven solutions powered by the capabilities of AI and machine learning will operate at peak levels of efficiency, and will be best placed to set standards and lead the way throughout the industry.

"The devil is in the detail," said Chris Pontet, Head of Product Marketing at GreenSteam, which uses machine learning technology for vessel operational efficiency.

He also said that it is "impossible" for human intelligence to reach the same depth of insight about fleet efficiency and shipping energy consumption as machine learning.

"We've been doing this for over a decade, so our systems have been learning for over 10 years," he explained. "Our machine learning-powered services can

show our customers where they are wasting fuel, so they can prevent it from happening and improve vessel performance across the fleet."

The biggest inefficiencies in a fleet could be trim-related, voyage speed, or hull fouling or coating issues. These can also be the greatest problems.

## Three data sources

GreenSteam's Discover service assesses a vessel by combining and analysing three separate data sources - AIS data, for position, course, and speed; MetOcean data, ie meteorological and oceanographic data, such as wave spectra and sea surface temperature; and also the ship's collected data, which contains fuel consumption or power, together with departure drafts.

A web-based SaaS (software as a service) solution, Discover presents its results online thus enabling a user to view data by logging on to a dashboard. Having assessed the historical operational performance, a vessel's inefficiencies will be able to be identified, from small to large.

"In the past, we have actually spotted where a hull coating has failed prematurely and would be costing the company a lot of money," Pontet added. "We identified where a cleaning had been too aggressive and destroyed the anti-fouling. Our insights enabled the company to bring the vessel back to a good level of efficiency."

As for tanker owners, the unknown price of fuel post-IMO2020 and the potentially fluctuating prices create a complex dilemma, while HFO is expected to decrease in value along with demand for those investing in scrubber technology.

GreenSteam recently worked with a large Norwegian owner because the company needed to find out if one of its vessels was performing properly. The hull had been cleaned, and initial analysis by the owner had demonstrated an efficiency improvement, yet the company was puzzled by continuing performance issues.

As a result, the company approached GreenSteam for help, and engaged the Fouling Analyzer service to get to the bottom of the problem.

Fouling Analyzer's data analysis demonstrated how, after that initial improvement, the vessel's performance decreased rapidly after around three months. GreenSteam advised the company to examine the hull to gather further evidence.

"The diver's report confirmed that the hull was significantly fouled," Pontet said, explaining that the vessel's hull was cleaned again, and after another initial improvement, the hull degraded even more quickly. "We were able to conclude that the initial clean had damaged the anti-fouling," he added. Now certain that this was the problem, the company was confident enough to recoat the hull during a drydock.

Pontet said; "It is the ability of our machine learning system to make sense of the myriad combinations of weather, sea-state, loading and fuel calorific value, and so on, which enables it to very accurately predict how the vessel will perform in situations where a standard, non-ML model, would have no data."

The predictive advice that the machine learning system provides isn't based on assumptions; it's derived from the trained performance model that is itself based on actual experiences.

## Data Assessed

All businesses create data, but it is only when that data is properly captured, analysed and interpreted that it can really help organisations to make major operational decisions. By gathering data and accurately assessing it, a company will be able to see what processes are inefficient, where improvements need to be made, and how much money and fuel this is likely to save.

TO



# Divers and ROVs - standards on the way

**Wärtsilä co-hosted an Institute of Marine Engineering, Science & Technology (IMarEST) UAE branch technical meeting, focusing on underwater services and other innovations from the vast engineering group.**

**T**he seminar attended by 140 people was moderated by Nikeel Idnani, IMarEST UAE branch secretary, who suggested that during the life of a vessel, the immersed hull and appendages may require inspection or repair.

While introducing Wärtsilä's Trident Underwater services, he pointed out that underwater in-situ services minimise vessel downtime and maintain a shipping company's profits and reputation. Trident was acquired by Wärtsilä in 2018 and today, specialist diver technicians perform work concurrently with port calls obviating the need of expensive drydocking.

Adrie Huijbregts who is currently a Senior Consultant at Wärtsilä Underwater Services, was the founder of Trident Diving. He explained that Wärtsilä has become the first OEM with a global underwater services footprint. Wärtsilä Underwater services minimise vessels' downtime by enabling high-quality maintenance, repair and refurbishment work to be performed underwater during port calls.

Underwater Inspection in Lieu of Drydocking (UWILD) or sub-surface repairs with divers, while on location, saves the shipowner and their clients both time and money by reducing off-hire and eliminating the need for expensive and cumbersome drydocking.

Certified Trident technicians can perform safe, reliable and cost-effective underwater and afloat repairs on a wide variety of vessel equipment and machinery. These repairs are carried out in wet or dry conditions below the waterline (hyperbaric or atmospheric) by Trident's underwater service specialists who are trained at the Wärtsilä Land & Sea Academy in the Netherlands and are class society certified to Class A wet-weld specifications. Permanent shell-plate repairs are performed using cofferdams designed and engineered in-house.

Trident is approved by all major class societies for In-water class surveys, as well as other types of inspections and repairs on thrusters, stabilisers, rudders and mountings eg box cooler and sea chest repairs, hull modifications for scrubbers, speed log and sensor repair/replacement.

"A clean, friction-free hull is key to maximising the fuel efficiency of a vessel as it glides through the water. Trident offers regular maintenance, such as hull cleaning and propeller polishing creating an unrivalled reputation as the number one provider of highly skilled underwater services," he claimed.

## Diver criticisms

There have been criticisms aired by major paint manufacturers, such as Hempel, saying

that divers can damage hull coatings by using brushes.

To alleviate this problem, several underwater maintenance companies have introduced remotely operated vehicles (ROVs). One such company is Norwegian-based ECOsubsea, which recently gained a license to operate in the Belgian ports of Antwerp and Zeebrugge.

This followed exacting tests to demonstrate that the system meets the latest strict clean water environmental regulations.

ECOsubsea won the contracts thanks to the technology's ability to remove all hull fouling from the water. This move also followed around 500 vessel cleanings undertaken in Southampton and Norway.

While hull cleaning is an important part of vessel efficiency it has become mired in controversy, due to the high risk of invasive species being easily transferred across the oceans and becoming an environmental and economic hazard.

Traditional hull cleaning methods include sending divers down under the vessel when alongside in port or at anchor with hull scrubbing technology. This method is being increasingly shunned, due to detritus falling to a harbours' seabed. Hard cleaning is also criticised, due to the tendency to also remove layers of hull coating during the cleaning process, ECOsubsea said

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Tor and his brother Klaus Østervold, the company began making a name for itself with its attention to detail and meticulous effort to ensure the system was as sustainable and robust as possible, meaning it efficiently cleaned hulls but did not increase the risk of contaminated coastal waters.

Claimed to be unique, the ECOsubsea technology consists of a ROVs that gently cleans the ship's hull moving across the surface. It applies the latest technology in hull cleaning to carefully remove fouling build-up without causing any pollution, the company said.

The system simultaneously removes the fouling, pumping it ashore through a filtration process plant where it is stored in collection bags and later used in biogas production.

Østervold said: "Our operation in Antwerp and Zeebrugge represents a significant milestone for ECOsubsea. Both Antwerp and Zeebrugge have been frontrunners within environmental regulations, and for us it has been important to provide a solution fully complying with the strictest standards. In addition, Antwerp and Zeebrugge are large ports serving many of our existing customers, but also many potential new customers.

"We believe we have leading technology, both in terms of our environmental footprint, and in terms of how fast we clean a hull and how gentle the coating is treated. This gives us a strong technological platform for further growth. The most important thing we advise operators to do is firstly to inspect the hull at least two times per year so that they can determine the biofouling condition and monitor this over time," Østervold added.

Port authorities are becoming increasingly concerned about the risks posed by shipping and what a vessel can and cannot discharge into local waters. Increasingly, ports are taking a zero-tolerance approach, making it harder for owners to find an opportunity to ensure their vessels have clean hulls that help reduce fuel bills and CO2 emissions.

The Port of Antwerp's Luc Van Espen, commented: "We are happy to welcome companies, such as ECOsubsea, that have the technology available to clean ship's hulls in a sustainable way. This not only preserves our dock waters from being polluted by alien species and heavy metals, but also offers a new service to our shipping lines, in a way that even sometimes ships deviate towards Antwerp in order to be cleaned, bunkered and repaired at the same time."

Joachim Coens, Port of Zeebrugge CEO, added: "As a port authority with a Clean Port strategy, we applaud companies like



### Underwater panel discussions in Dubai

ECOsubsea for offering an environmentally friendly ROV hull cleaning service in our port to our clients. Every measure or innovation in the shipping industry that reduces the CO<sub>2</sub> footprint of vessels will result in a more sustainable industry globally."

ECOsubsea was formed in 2008 by Tor and Klaus Østervold to develop a prototype hull cleaning technology that could safely and efficiently remove hull fouling without leaving any fouling in the water. The company has been developing its technology in Southampton winning contracts from leading shipowners. The Southampton-based system has accumulated more than 4,000 hours of service.

#### Key benefits -

- Minimises vessels air pollution to 5 – 15%.
- Minimises the spread of alien invasive species between continents (identified by IMO).
- Saves shipowners 5 – 15% fuel costs.
- Efficient handling of waste from ship hull.
- Full debris collection rate underwater.

Moves are also being made to set standards for in-water hull cleaning (IWHC). To this end, PML Applications is reportedly collaborating with other UK and international bodies to develop an IWHC performance standard.

This standard will be centred on independent verification using collected scientific data and will assist with local environmental risk assessments leading to the issue of regional licenses or permits for the use of particular IWHC systems at more port locations, a recent article said.

Established in 2002 as the wholly-owned subsidiary of Plymouth Marine Laboratory (PML) to facilitate the application of research, one of its core operations is in the field of marine biofouling and corrosion.

In March of this year, BIMCO participated in the first meeting (inception workshop) of the GloFouling partnership project at the IMO headquarters in London.

The transfer of invasive aquatic species (IAS) by ships from one place to another is seen as a major threat to the biodiversity of the marine environment. Therefore, in 2011, IMO launched a set of Biofouling Guidelines on the control and management of ships' biofouling to minimise their transfer.

BIMCO said it would actively take part in the project to help implement the guidelines in developing coastal states. The project concept was launched in December, 2018, and will run for five years, ending in 2023. During this period, there will be more than 400 smaller projects carried out under the umbrella of GloFouling.

At the meeting, participants spoke about how future ship designs could be modified to minimise or improve niche areas to reduce biofouling growth and aid cleaning. A discussion was held on the plastic that is released from a ship's coatings during in-water cleaning. It was proposed that this problem should be included in the project to raise awareness of the negative effects of improper cleaning.

A Global Industry Alliance (GIA) will be launched to encourage private sector participation in the project.

During the next Pollution Prevention and Response sub-committees (PPR) - PPR 7 and PPR 8 to be held in 2020 - a review of the existing IMO guidelines on biofouling management will be conducted.

The project initially included 12 developing nations as lead partner countries along with IGOs, NGOs and a few developed countries as strategic partners, including BIMCO.

TO

# RescueNET - the future of Search and Rescue (SAR)

**Maritime Rescue Co-ordination Centres (MRCCs) in Riga, Klaipeda and Sweden's Joint Rescue Co-ordination Centre (JRCC) undertook an exercise in the Baltic Sea during the summer deploying a new SAR service that is claimed will be pivotal in the future of maritime safety.**

**D**ynamic Mercy 2019' exercise offered the opportunity to put RescueNET through its paces - the free service offered by Inmarsat for which over 33 countries have already signed up.

Baltic MRCCs Riga and Klaipeda were amongst the first to adopt this new system.

Inmarsat has been providing maritime safety services for more than 40 years, ensuring that seafarers are able to contact vital emergency services at a push of a button when things go wrong.

However, RescueNET represents a significant advance, providing MRCCs and the ships they serve with enhanced messaging capabilities and – where every second counts – reducing the time taken to co-ordinate a rescue operation.

The RescueNET service is an addition to the Global Maritime Distress Safety Service (GMDSS) services mandated by the IMO, for which Inmarsat's latest Fleet Safety service is already approved. As the maritime world's first fully end to end IP-based safety system, Fleet Safety was approved by IMO last year and is already enhancing GMDSS, the satellite organisation said.



"Inmarsat's RescueNET system is a great step-forward in Maritime SAR, enhancing cross-border co-ordination of SAR operations and improving communication between adjacent RCCs and vessels in the vicinity of a maritime incident. Thank you again Inmarsat for presenting this excellent tool to the SAR community!"

Vladimirs Sadoha, Latvian Navy Coast Guard, MRCC Riga

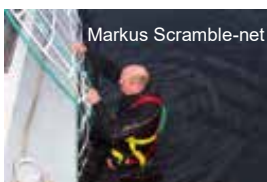
Today, when the distress button is pressed on a Fleet Safety terminal, the closest MRCC not only receives an alarm showing the vessel's information, position, course, speed and the distress type, it also prioritises communication

between the vessel and MRCC in the satellite network.

Furthermore, the MRCC can broadcast the Distress Alert Relay via Inmarsat SafetyNET II direct to vessels operating within a designated



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area equipped with Inmarsat C, Mini C and Fleet Safety terminals.

Going beyond these capabilities, RescueNET was developed to reflect technological advances in connectivity, delivering them to users where they matter most. For example, the service includes Distress Chat, a real time (text) chat interface with full distress priority on the network enabling multiple MRCCs and vessels to communicate 'live' during the SAR operation.

Information is stored and can be retrieved for post operation analysis.

### Data use

Other enhancements relate to better use of data: RescueNET offers MRCCs vital access to Inmarsat databases, in order to retrieve vessel contact information that can be invaluable as part of SAR. Again, users can now tap into the Rescue Co-ordination Centre Database to share information and status data provided by other MRCCs.

Attention has also been given to user-friendliness, as RescueNET shows the location of the distress vessel and nearby vessels on an interactive map, while alerts and messages can be downloaded in a pre-formatted report and Excel spreadsheet for operational report creation.

This enhanced functionality was very much in evidence as part of the Dynamic Mercy 2019 exercise, but the Baltic trial was significant for reasons other than its efficient co-ordination of a range of surface vessels, fixed wing aircraft and helicopters. The exercise took place at the limits of VHF coverage, often requiring the use of MF/HF radio communications between maritime rescue assets and the co-ordinating RCC.

During the exercise, MRCC Klaipeda experienced a loss of VHF and MF/HF communications. However, because MRCC Riga maintained stable communications with the on-scene co-ordinator and participating surface units throughout, RescueNET enabled information to be relayed via the Distress Chat function, so that Klaipeda remained a reliable additional link throughout the exercise.

"The use of Distress Chat keeps the operations room quieter and considerably reduces the amount of time MRCC personnel time would have to spend making long phone calls," explained Vladimirs Sadoha of the Latvian Naval Coast Guard Service MRCC Riga. "The MRCC could quickly list important information, like the casualty description, assisting units, call signs, etc, whereas by phone many terms must be spelt out."

Distress chat also allows MRCC personnel to retrieve necessary operational information, Sadoha noted: "In a real Search and Rescue event, the RCC could quickly put up a broadcast to vessels in the designated area, asking them to assist, keep a sharp lookout, etc. Distress Chat also enables easier post-event analysis, for an exercise or a real operation."

With 33 administrations already registered, it will not be long before RescueNET is supporting real world SAR, and there are other practical reasons why uptake is expected to be rapid.

One is RescueNET's position within the existing Inmarsat infrastructure: if a Fleet Safety Distress Alert is sent to an MRCC that is off-line, for example, the system will automatically redirect the alert to a geographically defined alternative MRCC. Again, Inmarsat's Network Operations Centre team receives notification of all distress alerts and monitors MRCC responses: if the alert has not been answered within a specified time, Inmarsat will call the nearest MRCC to request urgent assistance.

Another reason is that, while conventional SAR systems can be very costly to install and maintain, RescueNET does not require any specialised equipment and is effectively free to SAR authorities around the world.

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# Beware of restrictions before discharging washwater

The question of what to do with scrubber washwater was recently addressed by insurance and P&I service provider Gard, which could affect tank use on board in some instances.

**A**n IMO guideline, Resolution MEPC.259(68), specifies the requirements for the verification, testing, survey and certification of scrubber systems and sets out the criteria for discharging scrubber washwater into the sea.

However, some coastal states and ports have implemented local regulations with more stringent requirements that restrict or completely prohibit the discharge of washwater from open loop scrubbers or prohibit the use of scrubbers.

Gard has produced a list of those regions/states/ports with local regulations that have an effect on the discharge of exhaust gas scrubber washwater, although the list should not be considered as complete.

ASIA - China's Ministry of Transport (MOT) issued its 'Notice on Regulating the Implementation of Supervision and Management of Ship Air Pollutant Emission Control Areas' which stated that from 1st January, 2019 discharge of washwater from scrubbers is prohibited in the country's inland emission control areas (ECAs), port water areas of coastal domestic ECAs and Bohai Bay waters.

This document also states that a ban in the entire coastal domestic ECA will be announced in due course. The MOT recently circulated a draft recommending that the ban on the discharge of washwater be extended to within 12 nm of all coastal areas and regions near the southern island province of Hainan.

Hong Kong - If a ship intends to use scrubbers in Hong Kong waters, to meet the sulfur cap requirements, application must be made to the Hong Kong authorities requesting for an exemption from using compliant fuel. This application must be made at least 14 days prior to a ship's first visit to Hong Kong after 1st January, 2019.

Singapore - According to the Maritime and Port Authority of Singapore (MPA), discharge is prohibited in Singapore port waters from 1st January, 2020. MPA has published useful guidance on IMO's 2020 sulfur limits which advises ships fitted with open loop scrubbers to 'carry out the switch to either closed-loop mode or to compliant fuel well in advance of the vessel's arrival at the port waters'.

Residues from scrubbers have been classified as toxic industrial waste under Singapore's Environmental Public Health (Toxic Industrial Waste) Regulations. It can

only be collected by licensed Toxic Industrial Waste Collectors.

## Local regulations

India- In DG Engineering Circular 05 of 2018, India seemed to indicate that scrubber washwater discharges are allowed if the criteria set out in MEPC.259(68) are met. However, this is qualified with a requirement that local regulations should also be followed. As of now, it is not clear if local restrictions will be imposed in some areas.

UAE- Abu Dhabi: In 2013, Abu Dhabi authorities issued 'Vessel Discharge and Maintenance Guidelines For Owners, Masters And Agents'. It said that scrubber washwater can be discharged in port waters if free form pollutants whilst scrubber sludge should be discharged from the vessel to an Abu Dhabi Ports Company (ADPC) licensed waste disposal contractor.

Fujairah - The Fujairah Harbour Master has announced that use of open loop scrubbers will be banned in port waters.

EUROPE - Belgium -The European Commission's 2016 note on discharge of scrubber washwater, bans the discharge in ports and inland waters.



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Germany - Discharge is not allowed in inland waterways and the Rhine.

Lithuania -The authorities are currently studying the impact of scrubber washwater on the marine environment and will provide its conclusions upon completion of the study. Meanwhile, the current position seems to be that discharge is not allowed in port waters, according to port rules and conditions of use approved by the Ministry of Transport.

Latvia -General position, as mentioned in the European Commission's 2016 note, is that discharge is not allowed in territorial and port waters. Discussions are currently ongoing within the European Commission, on improving the regulations and to provide more clarity.

Ireland - Dublin: The Irish authorities' Notice No. 37 of 2018 'Prohibition on the Discharge of Exhaust Gas Scrubber Wash Water' stipulates that discharge of washwater is prohibited in waters under Dublin port jurisdiction. Dublin port jurisdiction includes waters from the Matt Talbot Memorial Bridge eastwards to a line from the Baily Lighthouse through the North and South Burford buoys and through Sorrento Point.

Cork -Port notice No. 15 of 2018 states that given the potential for impact on sensitive ecosystems, and the abundance of Natura 2000 sites within the jurisdiction of the port company, discharge of scrubber washwater is prohibited in port waters.

### Open loop ban

Norway-Under the amendments of 1st March, 2019 to Regulation No.488 on the environmental safety of ships and mobile offshore units, use of open loop scrubbers is prohibited in the Norwegian fjords. Also, for ships using closed or hybrid type scrubbers, a device for reducing visible emissions to air is

required.

AMERICAS - Hawaii - Conditional section 401 WQC (Water Quality Certification) as mentioned in section 6.7 of 2013 VGP allows for discharge of washwater subject to certain requirements being fulfilled.

Connecticut -Connecticut has laid down specific conditions as part of the 2013 Vessel General Permit (VGP) requirements. In accordance with section 6.5.9[UK1] of the 2013 VGP, discharge of exhaust gas scrubber washwater into Connecticut waters from any vessel covered under the VGP is prohibited.

California -The CARB OGV (California Air Resource Board for Ocean Going Vessels) regulations do not permit the use of abatement technologies such as scrubbers, hence their use as well as any discharge of washwater is prohibited. Vessel discharge regulations for Port of Long Beach also state that it is prohibited to discharge washwater from scrubbers in port waters. However, pursuant to CARB's Marine Notice 2017-1 discharge is permitted if the vessel has an experimental or temporary research permit.

AUSTRALIA -Bans on the discharge of washwater from open loop scrubbers have not been imposed by any state thus far. This is indicated in the summary of the 6th roundtable discussion hosted by AMSA and MIAL. It says that the authorities are currently looking at the impact of scrubber discharges.

SOUTH AFRICA - In marine notice no. 08 of 2019, South Africa has indicated that it accepts all types of approved scrubbers including open loop scrubbers as long as the IMO discharge criteria set out in Resolution MEPC.259(68) is met. However, recent reports indicated that South Africa may reconsider its position on the acceptance of open loop scrubbers. A decision was expected

in September.

Various other coastal states and ports are discussing enforcing similar bans citing the adverse effects of scrubber washwater on the marine environment. It is therefore likely that the above list of states/ports which currently regulate open loop scrubber discharges in their waters will grow over time, Gard warned.

### Two options

In those areas where the discharge of washwater is not permitted, vessel operators have two options to choose from to ensure compliance with the sulfur limits:

- Use compliant fuel instead of open loop scrubbers; or
- Switch over to closed loop mode of operation, in which case it will be necessary to convert currently installed open loop systems to closed loop or hybrid systems, if not already done.

Any changeover should be carried out well in advance of the vessel entering the areas with prohibition or restrictions in place. This will help in identifying operational issues, if any, after the changeover, and will allow for sufficient time to rectify such before the vessel enters the area.

Gard advised members and clients to monitor the situation closely and ensure that crews on board vessels fitted with open loop scrubbers are made aware of any relevant local discharge requirements in force.

As a precautionary measure, it is advised that vessels with open loop scrubbers installed, approach the local agents for detailed up to date requirements on the discharge of scrubber washwater as part of a vessel's voyage planning.

TO

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