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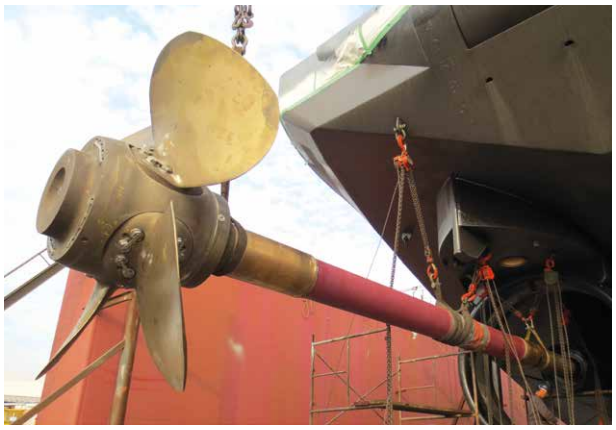
TWO TUGS FULL CONTROL

By Rotortug.

Contents



Alfa Laval has introduced a larger reactor (see page 19) enabling bigger vessels to opt for two BWTS instead of fitting multiple systems.

Its PureBallast family is fully IMO and USCG type approved and is based on chemical free UV technology.

With the new reactor, Alfa Laval can now offer BWTS of between 32 to 3,000 cu m per hour by fitting multiple units, claimed to be ideal for the tanker sector.

This saves installation and maintenance costs, plus the time taken to install BWTS, the company said.

Bunkers - a looming nightmare

We thought that the Ballast Water Convention had caused the largest ripples in the shipping industry for some time. We were wrong.

This accolade, if you could call it that, goes to IMO's low sulfur cap and zero emissions decrees.

Although I am in complete agreement with the reasoning behind these edicts, unlike a certain US President, there is no doubt that the result will cost the shipping industry billions.

As has been well documented and debated upon, shipowners and operators have to do something and pretty quickly to comply with the 1st January, 2020, 0.5% low sulfur cap.

Next year's IMO MEPC and MSC meetings are going to prove pivotal in laying down the guidelines needed to the various industry segments involved.

One of these segments is the bunker supply sector. There is no doubt that bunker suppliers could be caught out by different blended fuels, taken from different refinery runs.

But this has been a problem before, illustrated by the 100 or so vessels hit by bad bunker stems in Houston and elsewhere earlier this year.

Both BIMCO and the P&I clubs are suggesting new clauses in charterparties to cover any liability problems coming to light.

It basically depends on who is operating the vessel at the time of a bunker stem. Normally it is down to the owner or manager on a voyage charter and the charterer who is responsible for bunkering the vessel.

BIMCO's new timecharter clause states that charterers (operators) are obliged to provide fuel that complies with MARPOL requirements, grades and specifications set out in the charterparty, and it is a general compliance clause.

It also states that charterers must use suppliers and bunker barge operators who comply with MARPOL and that shipowners will remain responsible for the fuel management.

Another clause focuses on co-operation between owners and charterers to minimise quantities of non-compliant fuel on board by 31st December, 2019.

It states that any remaining non-compliant fuel on board after 1st January, 2020 has to be removed no later than re-delivery or 1st March, 2020 – whichever comes first. It also says that removal of non-compliant fuel must be done at the charterers' cost, while tank cleaning must be done at the shipowners' cost.

The 1st March, 2020 date is significant as from that day ships will not be allowed to have non-compliant fuel on board unless fitted with a scrubber.

Although still relatively small, scrubber orders have accelerated recently and we have even seen Frontline and TORM invest in scrubber manufacturers to guarantee availability of equipment for their vessels.

Fraud question

It is not just bad stems that are affecting the bunker supply market. Fraud seems to be another problem, especially dealing with the large sums involved in a bunker stem.

In November, 2014, at the time the world's largest bunker supplier, OW Bunker became insolvent, resulting in some shipowners paying twice for their stems, due to not being diligent over who they had made a contract with. This led to a hasty revision of bunker supply clauses to state clearly who the parties involved are.

The insolvency was due to an executive of OW's Singapore subsidiary allowing a large amount of credit to an alleged dubious bunker supplier.

A couple of months ago, Aegean nearly suffered the same fate, due to alleged misappropriation of funds to the tune of about $300 mill.

However, the company already had a 'white knight' willing to invest in the company, which was accepted by the US Bankruptcy Court in which Aegean had filed for protection under Chapter 11.

The significance of this is that Aegean claims to be the world's largest independent bunker supplier and has operations worldwide, so the knock-on affect of the company ceasing trading would have been substantial.

Of course, bunker suppliers are subject to the vagaries of oil price volatility and as yet, nobody has said with any clarity, what the cost of IFO, LNG or other blended types of fuel will be come 1st January, 2020.

This appears to be what the scrubber supporters are gambling on - the price of HFO and its continued availability. If there is a wide price difference between HFO, distillates and LNG, the scrubber manufacturers claim that the payback time could be as little as 12 months.

Another argument being banded about is that period charterers will opt for vessels, especially large tankers, fitted with scrubbers, as the fuel could be considerably cheaper.

IBIA has pointed out that IMO member states that are parties to MARPOL Annex VI are supposed to tell the organisation of the availability of compliant fuel oils in their ports.

There is an established mechanism to do so and now it is hoped this can be used to help shipping companies prepare for 2020 with detailed information about where and when compliant fuels will be available.

It follows a proposal by Liberia put to MEPC 73 to 'issue a resolution urging states to report the availability of compliant fuel oil well in advance of 1st January, 2020 to enable shipowners and operators to gain experience on the carriage and use of the new fuels on their ships and with proposed ship implementation plans to enhance a smooth and effective transition to the new regulatory requirements, IBIA said.

TO

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Owners should take heed of downward oil output revisions

Oil prices had been on an upward trajectory since July last year.

Brent values briefly climbed above $85 per barrel in early October. However, more recently prices have moved down to just over $70 per barrel.

Nonetheless, thus far in 2018, Brent has averaged some 34% higher than it did back in 2017, which is starting to make an impact on global consumption levels, Gibson said in a recent report.

The IEA has revised its figures for growth in oil demand for this year, down by 110,000 barrels per day to 1.3 mill barrels per day, most notably in non-OECD Asia. Vitol has made an even more dramatic revision, with estimates down by 400,000 barrels per day.

Concerns are also mounting that we could see slower growth in demand next year, partly due to a step-up in prices, and the US/China trade war. The IEA outlook for 2019 has been revised down by 100,000 barrels per day, while Vitol figures are twice that much.

Growth in oil demand is a valuable forward indicator for tanker trades. Should owners be alarmed by these downward revisions?

The crude tanker market appears unaffected at present, with other factors at play. A major rebound in VLCC spot earnings over the past month was driven by the combination of rising Middle East spot cargoes aimed to support a surge in Chinese demand and an ongoing robust long-haul trade out of the Americas.

More demand for tanker owners has come at a time of marginal growth in the trading fleet, restricted by robust demolition, while weather disruptions have also affected vessel schedules.

Suezmaxes and Aframaxes have benefited from the rebound in West African and Libyan crude exports, while much higher VLCC rates have also made smaller tonnage more attractive on certain routes, Gibson said.

Going forward, tonne/mile demand is expected to continue to increase, led by further gains in long haul trades, mainly out of the US. However, another round in OPEC-led cuts cannot be ruled out next year if robust growth in non-OPEC crude production leads to an overhang in oil supply.

In contrast, the product tanker market is more sensitive to changes in underlying consumption levels, as higher petrol prices at the pump threaten to limit demand in key product importing countries.

Slowing growth could also translate into a build-up in product inventories, a factor with potential negative implications for arbitrage movements.

Subsidies

However, a new trend is starting to emerge. Many economies which used the last oil price collapse as an excuse to phase out subsidies, have started reintroducing them again.

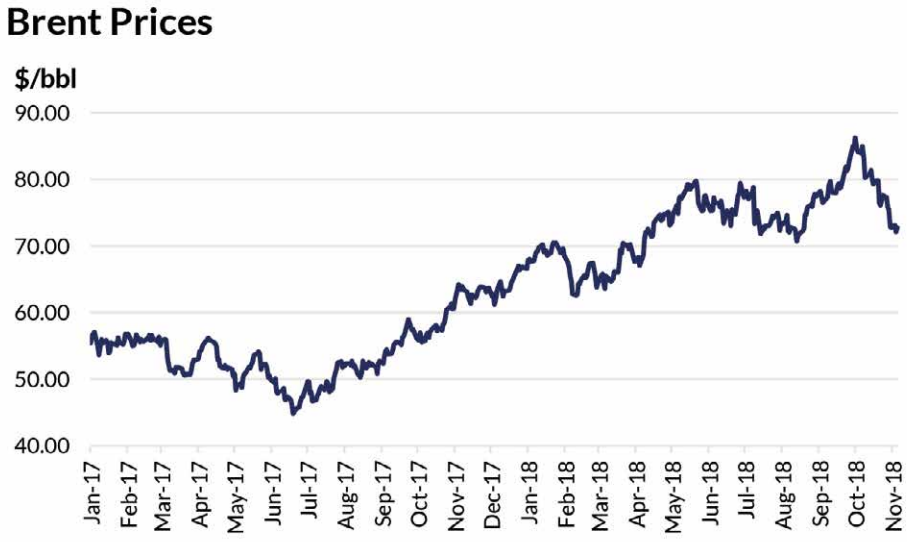
For example, in Asia, India has cut taxes for retail gasoline and diesel; Malaysia has reintroduced petrol subsidies and the Philippines government intends to suspend planned fuel tax increases next year. Indonesia has also announced a freeze in prices for subsidised transport fuels, while Thailand is considering similar measures. Finally, South Korea is evaluating plans to temporarily reduce taxes on retail gasoline.

The role of subsidies may become an even more important factor for protecting consumer demand over the coming years if oil prices continue to rise.

Last but not the least is the fact that crude and product tankers alike are likely to benefit next year with the IMO 2020 low sulfur cap.

As preparations get under way in the second half of 2019, we could see more barrels being traded, irrespective of potentially slower demand growth across the barrel.

Charterers are likely to take advantage of cheaper, HSFO-based freight rates ahead of the switch to 0.5% sulfur bunkers, while refiners race to produce as much compliant fuel as possible and move it into position ahead of 2020, Gibson concluded.



Source: Gibson Shipbrokers

OSM sees new dawn for tanker technical management

Norwegian based shipmanagement concern, OSM has plans to utilise a new breed of digital technology to increase transparency, efficiency and performance for the tanker segment.

CEO, Geir Sekkesaeter, explained; "At the end of the day all shipmanagement companies do pretty much the same thing. We provide a range of services that help shipowners operate their assets and meet commitments to customers. The price may be different, the relationships may be different and the standard of service may be different, but the proposition is often the same.

"Ultimately it can be the vessel superintendents, and the level of their competency, that can elevate one vessel above another in terms of overall management performance. That is something that we at OSM are working to change," he stressed.

Given his position at the head of a global organisation of around 30 offices, with about 11,000 seafarers and 500 managed vessels, one may expect a level of wariness, of caution. Instead, he prefers to tell it like it is.

Tankers have been pummelled, he said, by "challenging years" but he sees commercial opportunity ahead. Rate developments appear largely positive for many of the vessels OSM manages – around 100 of the company's 500 ships are tankers, including product tankers, VLCCs, Afromaxs, and others – while certain specialist segments are seeing increasing interest - shuttle tankers in particular.

"Shuttle tankers are complex vessels… which we like," he said. "Increased complexity means increased demands for management companies – you need specialist skills and proven expertise. We have that, whereas a lot of our competition does not. That puts us in a very strong position."

OSM CEO Geir Sekkesaeter

OSM manages shuttle tankers for AET and Ugland, which operate in the North Sea and plans to build a future presence in Brazil. The group's dedicated base in Manila is the epicentre for the obligatory DP2 training required, with local training resources used whenever necessary.

Sekkesaeter expected this business to grow, with the "new oil reality" making shuttle tankers a versatile, cost effective solution for smaller oil fields worldwide.

"It's a niche, but an important one," he argued. "As such its good for our business to have the specialist competency on hand."

In a market defined by ever increasing competition, the OSM head was keen to stress how his company can differentiate itself and deliver business advantage for its customers. In other words, how they can provide an alternative to the aforementioned "pretty much the same thing."

The answer, it seems, lies in a revolutionary, digitally enabled operations centre. This, Sekkesaeter said, will build a platform for enhanced decision-making across the organisation, taking the onus off of individuals and delivering previously unimaginable insights.

Suddenly, it won't just be the tanker superintendent elevating vessel performance; it'll be an entire joined-up digital ecosystem. "We've constructed a new operations centre in Singapore that will be the main hub of OSM's technical management offer. Built on a tailor-made cloud solution it allows us to connect, aggregate and analyse data, captured from all vessels, in real time.

"We can essentially 'join up' our global operations to give full transparency, both financially and operationally, of all our activity. This allows us to identify trends, predict issues, address under-performing vessels, and generally harness the power of big data analytics to deliver on-going cost, safety and efficiency benefits for all our stakeholders," he explained.

Improvement culture

According to Sekkesaeter, the system will allow tanker responsible teams to access intelligence through a suite of applications – available on any device, anywhere in the world – and make optimal real-time decisions.

Crews and land-based facilities will work from the same platform, increasing shared understanding, while detailed reporting, modelling and machine learning will enable continual long-term benefits.

"This sets a new benchmark for the industry," he said. "Suddenly, it's not just about focusing on effective individual vessel management and operations, it's about creating an environment of learning, intelligence and innovation, where we utilise data to enhance services today and create new solutions for tomorrow.

"It's a genuinely exciting development for OSM and, we believe, the industry as a whole," he said.

Alongside 24/7 access to vessel data and insight, the centre will also provide round the clock assistance, with Master Mariners, Chief Engineers and logistics personnel on hand to, for example, to address system faults or answer spare part enquiries.

"We believe it marks the dawn of a new age of 24/7 vessel, fleet and business support and improvement. In the dynamic tanker sector it will deliver added planning capacity, predictability and performance, while our crews provide the specialist competency shipowners and energy majors demand.

"That overall proposition is certainly not 'the same thing' as the rest of the industry provides," he concluded.

OSM's Singapore operations centre is now fully functional. A test fleet is now operating within the new ecosystem to explore and document its full functionality.

Opportunities in Aframax segment

Norwegian shipowner Bergshav Management employs only 20 staff, and either owns or co-owns 13 tankers, writes Charlie Bartlett.

But private ownership, a small asset footprint and a large pot of ready capital affords the company a nimble and cautious approach to shipping investments. In general, it shies away from speculative purchases, and particularly newbuildings, focusing instead on the acquisition of capable, existing tonnage, CEO, Atle Bergshaven explained.

"Generally we never build unless there is already a long-term charter agreement in place," he said. "There is already a surplus of vessels and we will never add to that by ordering speculative tonnage. We are in the most speculative industry you can think of – why bet your company? It's more important for us to survive in the long run than make a quick short-term return."

Bergshaven highlights the rising costs in the newbuilding segment, including steel and labour, which compares with a proportional decrease in the cost of secondhand vessels, making buying, rather than building, the more attractive option. "We can sit tight and wait things out," explained CFO, Andreas Hannevik. "The advantage of that is that when market opportunities come along we're in a position to act. We have very healthy finances despite a very weak market over the last few years."

Fortunately, it may be that just such an opportunity has arisen. Despite low rates and overcapacity, the company believes that instability in global trades around the world, as well as vast increases in non-OPEC oil production – anticipated by the International Energy Agency (IEA) to increase to 63.3 mill barrels per day in the next five years – make now an attractive time to invest in the tanker market.

"We're at a low point now, rates are truly depressed. But we believe the market will turn and we are looking for good timing here," said Hannevik. "We invested in a new aframax in the summer… we think it's an attractive entry point."

Part of the stimulus comes from the US, which has taken over from Russia as the world's biggest oil producer. Since the oil price has made a recovery in recent months, dormant wells in the US have returned to production, vastly increasing output over 2014 levels. According to the US Energy Information Administration (EIA), production is likely to outpace both Russia and Saudi Arabia, at least until the end of 2019.

"We benefit from the trading patterns changing," Hannevik said. "More oil coming out of the US brings a lot more demand to our segments.

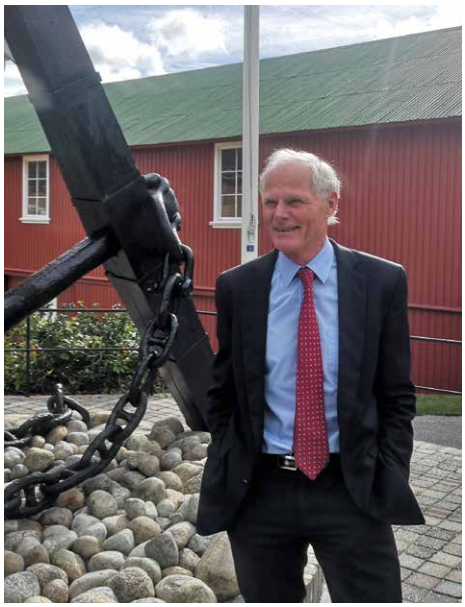
"They're producing in excess of 10 mill barrels per day, and they are the largest oil producer in the world, and they have opened up for export. The largest vessels, the VLCCs, cannot access the American ports, and they need Aframaxes for shuttling it. Both import and export to the US is good for Aframaxes. We have three of our four Aframaxes operating in the US - the new one is in Asia but will soon be redeployed to the US as well.

"We have two dedicated lightering ships – 'Bergina' and 'Bergitta' – we had them built as lightering ships," explained Bergshaven. "Now they're reverse-lightering – taking cargo from shore to the bigger ships."

Complex landscape

And this is likely to increase, as well, thanks to the current complexity of the geopolitical landscape, including embargoes on Iran and Venezuela. "Trade patterns will be affected this year because we are not allowed to trade with Iran," said Bergshaven, pointing to potential price increases thanks to an increase in the demand for floating storage, amongst other factors. "That would be a disruption in the market, of course the more disruption we see the better it is for us."

Hannevik pointed to increasing scrapping rates, and expects that the IMO's 2020 0.5% cap on sulfur will increase the proportion of scrapped tonnage. "One likely scenario is that there will be slow-steaming, which will limit supply, and improve the supply-demand balance.



Bergshav CEO Atle Bergshaven

"Everyone in shipping would like to buy low and sell high. But the advantage of being a family owned business with a conservative profile is that we don't have a lot of loans, we have a lot of cash reserves, we're not restricted by a board and investors telling us we have to put our capital to use," he said.

With a large proportion of tonnage operating within the North American ECA, Bergshav is already complying with domestic 0.1% sulfur restrictions there by running its vessels on low sulfur fuel oil. Bergshaven was sceptical of the future scrubber technology. "We just read that the Chinese will not allow [open-loop scrubbers]," he says. "That forces owners to return to marine diesel.

"There will be new marine diesel, and new marine distillates, and we hope that there will be sufficient supply that we can utilise, and the price difference will be lower," he added. "But we've seen that 80% of scrubbers are open-loop, and if that is not allowed in the ECA areas, it will only be able to be utilised in part of the world. There are just so many different factors at play," he concluded.

Anchorage turnaround efficiency key to Gibraltar's success

Business is brisk in Gibraltar's main Western Anchorage where 14 slots are available mainly for bunkering purposes.

To gain greater efficiency in vessel turnarounds, the Gibraltar Port Authority (GPA) has limited each vessel's stay to around six to eight hours. Longer periods at the anchorage slots can be arranged, depending on the circumstances.

Around 10-15% of the fuel bunkered is low sulfur fuel, as many vessels bunker before sailing on to northern Europe. The IMO is studying the adoption of the Mediterranean region as an emissions control area (ECA), although this may take a little while to become mandatory.

The recently appointed CEO and Captain of the Port, Manuel Tirado told *Tanker Operator* that the GPA had almost completed the legal framework for LNG bunkering operations, however, the uptake of this operation will be dictated by demand.

Fuel oil is stored either on an Aframax berthed on the detached mole, or in Algeciras at either Vopak's or Cepsa's tank farm or across the strait at Tangier.

To effect a crew change or to carry out husbandry or repair/service work, in addition to bunkering, the vessel's Master must satisfy the GPA that the vessel has the adequate manning levels to conduct a multiple operation by demonstrating a risk assessment and method statement showing that the vessel may conduct other simultaneous operations.

Failing this, a vessel will normally need to move to the Eastern Anchorage if the ship's crew cannot handle the tasks simultaneously. Some of the local agents have complained that this manoeuvre makes their services that bit more expensive. However, Capt Tirado explained that ancillary services can be carried out in the Eastern Anchorage for the first 48 hours with a 75% discount rate applied.

In October, the GPA's purpose built headquarters was officially opened

One advantage of carrying out crew changes at Gibraltar is that a crew member does not need a visa to fly from the UK, as long as they are being met by a local agent. If arriving in Spain, possibly having been diverted from Gibraltar due to bad weather, they will, however, need the correct immigration paperwork, otherwise the crew member will be sent back to the UK.

New ops centre

GPA's port main operations was recently re-housed in Windmill Hill Road having been down by the port area for many years. The operations centre is housed in a purpose-built building, which also contains the new Kongsberg Norcontrol vessel traffic service (VTS) system, which commands the whole of the Straits, as well as monitoring vessel movements in Gibraltar Bay, vastly improving the Port Authority's monitoring capability of British Gibraltar Territorial Waters (BGTW).

Due to its location, a visual watch can also be maintained in conjunction with the radar watch. The control room's desks are ergonomically designed and everything is recorded, including the thermal infra-red CCTV imagery, AIS tracking, telephone, and VHF for possible use in near miss and incident investigations, as well as for training purposes.

The vessel traffic management system (VMS) also allows vessels and their agents to gain greater efficiency when entering the

Bay, as vessel information can be input by the agent before its arrival. A traffic light system is then applied whereby red signifies the start of approach operations, amber refers to all the documentation being in place and green means the vessel is cleared to enter the Bay.

Within the building there is an incident command room where any issues can be fed into directly from the VTS station above and displayed on screens. This room is also used for lectures and for training.

VTS watchkeepers are employed in two shifts of 12 hours each, while the launch crew in the port area are employed using a three shift system.

Capt Tirado explained that bunker operations are strictly regulated by two designated bunkering superintendents, as are the ship-to-ship transfer operations in the Bay. There are, on average, six STS operations carried out per month based on 2018 figures to date and meetings will be held beforehand with the Mooring Masters and the 'person in overall advisory control' (POAC).

There are no STS operations allowed 'off port limits' and a 90 tonne bollard pull tug must be in attendance during the operation if one of the vessels involved is over 100,000 dwt. If a transfer involves a vessel of up to 80,000 dwt, a 55 tonne bollard pull tug will be needed.

Other STS operations are carried out off Ceuta across the Straits.

As previously mentioned, the GPA still maintains a presence in the downtown port area and at the launch base. Separately, there are currently seven pilots available.

As for the local tug services, they are now carried out by Resolve Marine Services (Gibraltar), part of the Florida-based Resolve Group, which purchased the local tug company in 2015.

Resolve Marine has four harbour tugs at its disposal, with a new tug the 'Resolve Hercules', a 55 tonne bollard pull tug having being commissioned earlier this year and which will replace one of the older tugs.

Shiprepair

Another major service offered by Gibraltar is shiprepair.

The old UK Royal Navy dockyard in Gibraltar is now run privately by Gibdock, and is experiencing a busy period.

Gibdock is currently handling OSVs, ferries, superyachts and other vessel types in its three drydocks of up to Panamax in size, as well as making good use of its afloat facilities of 1,000 m in length, plus berthing across the three drydock entrances.

In addition, several bunkering vessels were recently docked operated by Peninsula Petroleum. These include the chartered, Clearwater managed, 2011-built 10,303 dwt 'Ovit', the 2010-built 7,203 dwt 'Panama 100' and the 2008-built 3,537 dwt 'Hercules 100'.

Other tanker handled were the Chilean-managed 2013-built, 46,589 dwt built 'Meridian Express; the Anglo-Eastern managed 2015-built 30,711 dwt 'Store Bay'; Christiania Shipping's 2004-built 3,418 dwt 'Sofie Theresa' and ABC Maritime's 2011-built 'Adfines Sky' for both afloat and docking repairs.

Typical of the docking work was the 'Adfines Sky', which underwent topsides hose down and touch up, antifouling coating down to the waterline level, main engine and turbocharger repairs, tank work and other repairs.

The local Resolve tug fleet is also docked periodically.

Gibdock is marketing its facilities for both ballast water treatment (BWTS) systems and exhaust gas cleaning systems (scrubber) installations, making use of its PAD 1 pre-assembly area. Recently, the 34,500 dwt John T Essberger managed bulker' Zambesi' underwent what was described as a complex BWTS retrofit.

The yard's own technicians carried out the necessary pipework and preparations on board before assembling and installing the owner supplied UV-type BWTS. The yard worked closely with UAE-based Aries Marine on the project, which is a BWTS engineering retrofit specialist.

As well as having a BWTS installed, Gibdock carried out 2,500 sq m of blasting and painting on the bulker's topsides and underwater hull areas, the removal and retrofitting the ship's propeller, overhauling the main engine and carrying out steel repairs in the ballast water tank area.

Gibdock also recently completed scrubber installations on five Norbulk tankers using its pre-assembly facility PAD 1 where the funnel casings and support systems were put together.

The yard can handle all shipyard work using its in-house workforce, including steelwork, pipework, mechanical/machining work, painting, blasting, tank cleaning, etc.

Electrical work is sub-contracted using a specialist electrical company, which has worked alongside Gibdock for many years.

John Taylor, Gibdock's operations director explained that the yard preferred to bring a vessel alongside to carry out repairs when not requiring a drydocking rather than use a flat top barge in the Bay.

The reason being the short deviation time from Gibraltar Bay to Gibdock of roughly 45 mins, thus providing a client with all the necessary facilities at hand and providing a quicker repair turnaround.

He said that although the yard was not the cheapest, it could deliver quality repairs and retrofits and redeliver a vessel on time and on budget.

To keep the yard up to speed, Gibdock is currently refurbishing two of its large dock cranes and had recently completed work on its tower cranes.

LNG conversion

Although not a tanker, an example of the yard's capability was the recent award of an LNG conversion project for a Balearia ropax.

The 'Napoles' was due in the yard on 15th November for a three-month conversion project to dual-fuel propulsion. Gibdock will be fully involved in all the work necessary, including steelwork, pipework, electrical work, insulation work, the lifting of a 200-tonne LNG tank on board the vessel and assistance with the MAN main engine modifications.

Wärtsilä will be supplying the LNG package for the vessel.

In addition, 'Napoles' will be undergoing routine drydocking maintenance work, including the extensive modification to her saloon area.

Her sistership - Sicilia' - is due to undergo conversion next year. TO

Gibdock's facilities can clearly be seen

Service companies take advantage of ship calls

Covering the Mediterranean and its approaches, Wilhelmsen Ships Service (WSS) has added Malta and Las Palmas to its hub operations.

The two extra ports have joined Gibraltar, Algeciras and Ceuta to expand WSS coverage under the Strait Of Gibraltar concept 'Your Strait Solution'.

This allows WSS to offer unique lump-sum fees for any bunker calls within its bunkering footprint. As a result, customers can pre-plan their voyages better and have total flexibility.

WSS has also centralised its husbandry business, including spares and crew changes, for the region in Lisbon to increase efficiency by having just a one point of contact, which takes pressure off the local agents operating out of the ports, such as Gibraltar, Nicholai Bado, Ships Agency Manager, Gibraltar told *Tanker Operator*.

The company has also introduced a Bunker Service Agreement, which is aimed at reducing time spent on communications, improving cash flow and reducing the number of financial transactions, plus minimising the time spent on administration, such as disbursement accounts and settlements.

As well as looking after the day-to-day agency side of the business, Bado is also the Bunker Service Agreement Regional Ambassador – Europe.

Key hubs

The service is controlled from key hubs worldwide and WSS now claims to be the world's largest global bunker agent.

Gibraltar is one of the world's largest bunkering ports and by signing up to the agreement, a vessel operator will benefit from

- Pre-arrival formalities and ISPS requirements completed 24 hours prior arrival.
- Vessel always confirmed in port Vessel Management System prior to arrival.
- Bunker suppliers, surveyors, port authorities and pilots always given ETA updates.
- A service boat is always ready for bunkering surveyor to attend upon arrival.
- Bunkering progress is always followed and the service boat is ready for the surveyor upon completion.
- Any deviation from the original plan will be appropriately communicated to the principal.

At Gibraltar, the information is provided from the recently opened vessel traffic management facility, in which the agents have an input to help control traffic entering the Bay.

Bado claimed that WSS's Gibraltar operation had reached second place in agency business behind Blands.

Being trialled at present is a Bunker Quality Survey (BQS), which is to be launched at the beginning of next year. BQS will be operated as a one-stop-shop and WSS will use one surveying company for the whole service, thus

avoiding sub-contracting.

Bado explained that these new initiatives were adding value to WSS's port operations by offering a single point of contact. "We have to keep adapting," he said.

The company is also trialling the use of drones in Singapore to move spares and stores parcels to ships at anchor. Gibraltar is monitoring their use having two large anchorages available.

This service is scheduled to be launched from Singapore's Marina South Pier this month. WSS in co-operation with Airbus, will be piloting the delivery of maritime essentials via Airbus' Skyways unmanned aircraft system (UAS) to vessels at anchorage.

Initially, the two week pilot trial targeted OSVs and bulk carriers from shore at Singapore's Eastern Working and Eastern Holding anchorages. If there is strong interest from other vessel segments, these options will be explored, WSS said.

Unmanned aircraft technology has proved its ability to speed up deliveries, slashing lead times traditionally seen with last mile deliveries. With a quicker response rate and turnaround time of up to six times, it has the potential to lower shore – to – ship delivery costs by up to 90% in some ports.

By replacing launch boat deliveries with unmanned autonomous deliveries, the risks of personnel accidents to board vessel are also significantly reduced.

Arrival of the SCAMP workboat 'Palencia II' at its Gibraltar Berth after attending to a full cleaning of a 285 m commercial vessel (see page 11)

Merger completed

At the end of 2016, Survitec completed the merger with Wilhelmsen Maritime Services safety business.

The transaction included the transfer of all Wilhelmsen Maritime Services (WMS)' safety related systems, products, services and competence to Survitec.

WMS holds a 20% stake in the Survitec Group.

Previously, WMS had controlled the safety side of the business for the region from Gibraltar and Algeciras and had a liferaft exchange operation on the Spanish side of the Bay, which was handed over to Survitec as part of the deal.

Bado also said that the Unitor chemical and cylinder supply operation was still an important segment of the business in Gibraltar.

Locally based ships electronics installer and service provider Sandvik Marine Services, has introduced an end of the month report for its shore-based maintenance (SBM) fleet agreements.

This lists any problems being experienced with a vessel's bridge electronics systems thus enabling a specialist to fix the problem before it becomes problematic.

The report is sent to all those involved with the ship and lists the key electronic components on board, including radars, ECDIS, etc.

John King, Sandvik's World Service Manager told *Tanker Operator* that this service was part of the problem solving process enabling equipment to be fixed or replaced much faster than before.

For the monthly report, King said all vessels are in contact with Sandvik via email or call the 24 hr support line. If anything urgent is notified, it can be fixed quickly with the company's worldwide service network or if critical, technicians can fly out with spare parts within 24 hrs.

The report includes the following points - battery expiry dates for GMDSS, which is important to be able to see if any are going to expire within the next six months.

King explained that most batteries are now lithium based and a problem to ship, so the more lead time the company has the better, as it maybe possible to link up in a port where stock is held.

Also on the monthly report are the software versions, as there is a need to ensure the software is up to date, especially on the ECDIS, as many vetting inspectors ask for this info.

Sandvik keeps this information in the database, and again if a new software is seen to be available, an upgrade is only suggested after it is seen to be stable. As long as the vessel has a compliant software version everything will be fine.

Also important is to keep track of the TX

hours of radar magnetrons to ensure the the best performance from the radars is being attained. The same applies to sensitive elements in Gyros. Sandvik is able to pick up on this and suggest to the owners/managers to budget for a spare before it fails. As for radio/VDR surveys, the company keeps an eye on the window and if if it is due and the vessel is in an ideal port to conduct a service, then it is a good idea to conduct it, King explained.

Also, through the report, Sandvik has a complete service history of the navigation and bridge equipment, so if equipment is costing a lot of time and money, the company can advise the owner/manager to change it.

As it is now critical for vessels to have two working ECDIS, Sandvik has a designated email manned by specialist technicians 24/7, enabling problems to be resolved remotely if needed with Team Viewer. King said that 70% of the time the problem is fixed remotely.

He explained that around 80% of the business is SBM fleet contracts and among the companies Sandvik works closely with are BW in Singapore and Norway, Transpetro, Viken and Westfal-Larsen who recently signed up to an SBM contract. .

King said that since new regulations have come in, he has seen a big demand for surveying, servicing and supplying fire safety radios and that more ships are being added to Sandvik's portfolio.

Sandvik has recently opened an office in Panama to service the vessels waiting at the anchorages at both ends of the canal.

He said he had found good people to work with worldwide from mainly small service companies who could be flexible when being called upon to conduct a service or survey at short notice.

The company has recently recruited two more service engineers. TO

HullWiper, in partnership with ship fuel conservation and underwater services provider SCAMP, is now offering a hull cleaning solution for vessels transiting the Strait of Gibraltar.

The agreement marks the latest expansion under HullWiper's global leasing programme, introduced in 2017, to work with partners worldwide to offer shipowners and operators a cost-efficient, brush- and diver-free alternative to traditional hull cleaning methods that is friendly both to the environment and the bottom line, the company said.

HullWiper's remotely operated vehicle (ROV) is now in place to support Gibraltar's initiative to comply with IMO guidelines, whilst offering owners and operators the benefits of a foul-free hull, including improved vessel performance, fuel savings and lower GHG emissions.

"Our partnership with the important global player SCAMP is a positive step in our expansion plans," said Simon Doran, HullWiper's Manager Director. "Gibraltar is our first stop together. With an estimated 71,000 vessels transiting the Strait of Gibraltar every year, it is one of the few ports that can provide any type of service to vessels of all sizes and types. HullWiper is a good fit."

HullWiper's patented underwater hull cleaning system uses adjustable seawater jets under variable pressure to dislodge waste materials and remove fouling and invasive alien species (IAS), without the scrubbing, harsh chemicals or abrasives used for traditional methods.

HullWiper leaves expensive antifouling surfaces intact and does not harm the delicate marine environment. No divers are used, so there is no risk to human life and cleaning can be conducted day or night, in most weather conditions, and whilst cargo operations are underway.

Removed residues are collected by an on board filter and deposited into dedicated drums onshore for locally-approved environmental disposal.

Freddie Pitto, SCAMP's global general manager shipping services, said: "The SCAMP worldwide network supports the IMO initiatives for greener and cleaner practises in the industry. Working with HullWiper will enhance our environmental method capabilities and ensure we meet future requirements relating to hull maintenance."

Stop wasting money on navigational data

GNS has unveiled Voyager FLEET INSIGHT (VFI), the latest milestone in its long term programme to improve how shipowners buy and use navigation and vessel data for operations and compliance.

In a shipping market where claims of game-changing functionality occur only too frequently, GNS said that owners can finally stop wasting money on unused navigation data and take real control of vessel performance and compliance.

VFI users report savings of between 30% and 70% on navigation data outlay, improved vessel visibility and simplified compliance, GNS claimed.

The software is the culmination of four years of data collection and analysis that is now available to give shipowners, operators and managers the ability to see for the first time exactly what navigation data they are buying, how much they should be paying, where they are wasting their money and where the gaps exist.

"This is data that owners and managers say they want at their fingertips but its volume and complexity make it difficult to draw together in a single application to provide effective fleet management tools," explained GNS CEO, Paul Stanley. "At GNS, we have been using this data in customer workshops for the last two years to take buyers through the detail of what they are spending and where they can save money - the results are startling."

VFI's navigation management functionality has been designed to revolutionise how navigational products are bought, managed and used, the company claimed. The service gives shipping companies complete transparency in terms of the ENCs, paper charts and nautical publications their vessels need, how much they should be paying for them and - for the first time - how much money they may be wasting by buying products they don't need.

"The levels of unneeded expenditure on navigation data we see is very significant and the gaps that our data identifies provide a real opportunity to improve index compliance," Stanley added. "Too often shipping companies lack real-time access to all the navigation, position and voyage data they need in an easy to use format."

VFI provides multiple levels of vessel operational functionality. Owners can use it for vessel tracking, monitoring sailing times to estimate more accurate operating costs,

GNS's Hayley van Leeuwen

build in Port State Control (PSC) data into KPI monitoring, or track progress against charterparty terms by overlaying the approved route on the vessel track.

The service maintains up-to-date lists of the technical library publications required by each vessel's flag state, SIRE vetting and other key stakeholders, and enables marine and HSQE managers to take action to close any gaps in vessel inventories. It also provides global PSC inspection histories for all vessels to make it easier to monitor and measure actual compliance against KPI performance.

Its tracking feature enables users to view historical data going back to 2015, which provides both a record of trading, as well as being a tool for shore-side incident management. Vessel port call history, anchorage times and sea hours data all have relevance for operational planning, forecasting and budget management.

"When users need to compile yearly operating costs for a vessel, Voyager FLEET INSIGHT's sea hours and port call data enable variable cost elements, such as port fees, bunkers and lubricants to be more accurately calculated," Stanley said. "Being able to easily see how much time a vessel has spent steaming and at anchor helps marine managers to identify and plan maintenance in a timely way."

Shipping companies do not have to be GNS customers to benefit from VFI, as the service is available to all operators globally, the company stressed.

It is claimed to be competitively priced and ideal for all companies looking to get a grip on big data and analytics, reduce navigational costs and enhance compliance management without the need to invest in the development of costly in-house systems, GNS said.

Talking with *Tanker Operator*, Hayley van Leeuwen, GNS Head of Product, explained that this software joins ship to shore and creates a simple and very efficient way to share information between the two teams to improve visibility, transparency and situational awareness. For example, VFI shore-based users can view planned routes and monitor them against actual fleet positions.

The status of the vessels' chart and publication inventory on board can be seen – what is up to date and what is out of date and what is missing ahead of any vetting inspection or port call (including PSC inspection). They can see their entire fleet's PSC record on one screen and view that data by vessel as well as by port.

They can even see how secure the on board PC is and where the on board system is vulnerable to cyber risks so that they can take action to protect the vessel, she said.

She claimed it had a very simple pricing model. A GNS customer receives a bunch of free tools to help manage the relationship with the company, as simply and efficiently as possible.

A Navigation Management package is available, which is claimed to be very affordably-priced that everyone can have access to (whether they are a GNS customer or not) that enables shipping companies to see how much of the navigation products they are buying, are being wasted.

This enables them to actively take steps to reduce that waste, as well as providing important operational data such as nautical miles, sea hours sailed and port call data to help improve budgeting, estimating, forecasting, cost management generally, as well as other services, such as KPI management.

"Our aim is to make navigation completely transparent and to give shipping companies as much information as we can to help them manage their fleets as efficiently and safely as possible.

"Since 2015 we have captured over two

billion data points. We originally started capturing this data to enable us to accurately predict how much navigational data vessels used and provide extremely accurate fixed prices to our customers for their navigation supplies.

"With VFI, we are now setting that data free and putting it into our customers hands. Because we collect data about the world fleet (not just vessels we supply) that data is also facilitating the development very effective (and sophisticated) KPI management and benchmarking tools to help monitor and improve fleet performance further," she explained.

"Today, VFI is providing ship companies with an easy way to track nautical miles travelled, sea hours sailed and port turnaround times. Customers are already using this data to help them to manage ship operations more efficiently – for example to more accurately estimate operational budgets, identify overspending and schedule maintenance. Going forward, as we add more data and more tools, it will increasingly help with performance analytics," she added.

She also stressed the problem of costs by saying that as GNS sees it, these costs relate to charts and publications and how vessels are buying navigational data.

"What we can see from our data is that vessels are routinely buying significantly more digital charts and publications than they really need to buy and then not sailing through the areas those products cover before they expire.

"For example, we see vessels sailing exclusively between Australia and China and buying vast numbers of ENCs charts of the Southern Atlantic. The wastage can be anything between 20% and 50% of the products actually being bought. That equates to many thousands of dollars of untapped savings," she concluded.

In addition, GNS and SIRM have announced a strategic partnership to deliver an expanded range of cost-effective cloud-based services for shipmanagers.

The new partnership will combine GNS's expertise in data intelligence, back of bridge software and navigation with SIRM's cloud-based services and telecommunications capability to deliver new ship-shore technology solutions and enhance office-based situational awareness.

The first focus area of the new partnership is the integration of SIRM's patented FleetOnCloud and GNS's VFI solutions to enable owners and managers to track vessel movements, monitor performance and support incident management from ashore.

FleetOnCloud is a flexible, secure and scalable way to connect ship company logistics, engineering and navigation departments directly with the data and information produced by the fleet, SIRM said.

The software works by capturing data from around the ship, including real time ECDIS and radar videos and key data captured from on board sensors to meet the noon report, EU-MRV and other reporting requirements.

System combination

Combining the two solutions will provide shipping companies worldwide with unprecedented levels of understanding and awareness of day-to-day operations and vessel performance, the companies claimed.

Two modules are offered to enable shipmanagers to gain significant operational and commercial benefits, SIRM said:

- FleetOnCloud's DataInsight module provides the opportunity to achieve new levels of automation that will reduce reliance on error-prone manual processes and make reporting and analysis of key performance indicators (KPIs) more efficient.
- FleetOnCloud's BridgeView module enables video of bridge systems, such as ECDIS and radar to be retrieved at any time and used to view the exact status on the bridge at the time of an incident to support insurance claims, as well as for crew training purposes.

FleetOnCloud uses dedicated 'Readybox' on board hardware to capture and store data making it faster and easier to access, view and interrogate critical operational information.

The development of FleetOnCloud has benefited from collaboration with a leading shipping company, which has made a key contribution to both the functionality and the operational validation of services on its fleet of over 400 ships.

"We are on the cusp of a technology revolution in the marine industry. With data volumes increasing and real-time intelligent response a necessity of doing business, companies are becoming more dependent on technology," said Luca Cesare, CEO, SIRM. "Working with GNS to bring together our communications expertise and GNS's maritime solutions excellence, we are well-equipped to help companies solve the tough technology challenges, improve operational efficiency and enhance safety."

"We are very pleased to be working with SIRM on this exciting initiative. By combining GNS's expertise in maritime solutions, with SIRM's vision for ship-shore data exchange, we can achieve exciting new digitally-led efficiencies and safety improvements," said Stanley. "Together GNS and SIRM are developing new and exciting innovations ashore and on board that address user challenges and help shipping companies achieve the efficiencies and improvements promised by digital navigation."

The GNS and SIRM solution uses a cloud-based architecture, which is easily scalable and has high security standards for data protection, enabling data to be retrieved, loaded and displayed faster. FleetOnCloud services can be accessed via an app, and is also optimised for tablets and smartphones. TO

Record-low hijackings reported

Some 156 incidents of piracy and armed robbery against ships were reported to the ICC International Maritime Bureau's (IMB) Piracy Reporting Centre (PRC) in the first nine months of 2018.

This compares to 121 incidents reported for the same period in 2017.

This year's figure includes 107 vessels boarded, 32 attempted attacks, 13 vessels fired upon and four vessels hijacked. No vessels were reported as hijacked in the third quarter of 2018, which was first time since 1994 when no vessel hijackings were reported in two consecutive quarters.

Nevertheless, incidents of this crime still persist, the IMB warned with the number of crew members held hostage increasing in comparison to the same period in 2017—from 80 incidents to 112 by 3Q18.

By ship type, the total included 56 tankers, 51 bulk carriers, 13 containerships and 36 other vessel types.

Pottengal Mukundan, IMB director, said: "While the record low number of hijackings in the second and third quarters of 2018 is of course to be celebrated, incidents of maritime piracy and armed robbery remain common. ICC urges governments to leverage the timely data available from the IMB PRC to concentrate resources in these hotspots."

Statistically, the Gulf of Guinea accounted for 57 of the 156 reported incidents. While most of these incidents were reported in and around Nigeria (41), the Nigerian Navy has actively responded and dispatched patrol boats when incidents have been reported promptly.

There was also a noticeable increase in the number of vessels boarded at the Takoradi anchorage, in Ghana.

Gulf of Guinea

It was noted that 37 of the 39 crew kidnappings for ransom globally have occurred in the Gulf of Guinea region, in seven separate incidents. A total of 29 crew members were kidnapped in four separate incidents off Nigeria—including a 12-crew kidnapping from a bulk carrier off Bonny Island, Nigeria in September, 2018.

In other world regions, incidents of piracy and armed robbery are comparatively seldom. No new incidents have been reported off the coast of Somalia in 3Q18, while two fishermen were reported kidnapped off Semporna, Malaysia in September, 2018.

Incidents in the remaining regions, including some Latin America countries, border on low-level opportunistic theft. Nevertheless, the IMB continued to encourage Masters and crew members to be aware of these risks and report all incidents to the 24-hour manned PRC.

As for the piracy and sea robbery situation in Asia for October, 2018, ReCAAP reported six incidents of armed robbery against ships during October, up by one from September's reported five.

All the incidents were verified and reported to ReCAAP ISC by ReCAAP focal points, contact point and regional authorities.

However, no piracy incident was reported nor any report of crew abduction in the Sulu-Celebes Seas and no hijacking of ships to steal oil cargoes.

Despite this, ReCAAP said that the abduction of crew for ransom in the Sulu-Celebes Seas and waters off Eastern Sabah remained a serious concern.

ReCAAP ISC issued a Warning on 30th October, 2018 alerting the shipping industry regarding a group of around 10 Abu Sayyaf Group (ASG) members planning kidnapping activities at any opportune time in undisclosed areas in Sabah, targeting businessmen or foreign vessels' crew passing through the area.

The organisation received information from the Philippine Focal Point (Philippine Coast Guard) that the ASG group armed with pistol, rifles and a grenade launcher was planning raids. They are using unmarked coloured blue and white motorbanca locally known as jungkong.

Of the six incidents reported in October, five incidents occurred on board ships at anchor/berth and one incident while a ship was underway - one was a CAT 2 incident, two were CAT 3 incidents and three were CAT 4 incidents

For the first nine months of this year, 70 incidents comprising of 56 actual incidents and 14 attempted incidents were verified and reported to ReCAAP ISC during the January/October period.

Of these, 67 were armed robbery against ships and three were piracy incidents.

Compared to January/October, 2017, this was a 5% decrease from the 74 incidents reported.

Yemen problems

The entrance to the Red Sea off war torn Yemen is still a cause for concern.

For example, On 3rd November, Stena Bulk's IMOIIIMAX 'Stena Imperial' reported a suspected pirate approach whilst on northbound passage through the Red Sea west of Yemen while sailing from the Far East to Rotterdam.

According to Stena Bulk's report, two suspicious skiffs were seen approaching 'Stena Imperial' from the port side at a distance of 1.5 nautical miles. The alarm was raised and the Master and the on board security team mustered on the bridge. Hand flares were fired towards the skiffs as they continued their approach.

The Master broadcasted a security message and also contacted a nearby warship. Both skiffs passed by the stern. One of the skiffs again tried to approach the vessel and again hand flares were fired. The skiff then slowed down and moved towards another vessel.

"On the whole the pirate situation in the Gulf of Aden has calmed down and there have not been any hijackings for a long time. But when we sail off the coast of Yemen we choose to use guards, due to the lawless state prevailing in the country at the moment.

"This has created the same kind of desperation in the population as we saw in Somalia a number of years ago. But we are monitoring the situation closely via our security department, which also keeps an eye on the situation in general on the global level.

"For us it is extremely important to take the measures that are required so that the crew feel safe, and that we at the same time follow the local regulations," Erik Hånell, CEO Stena Bulk explained.

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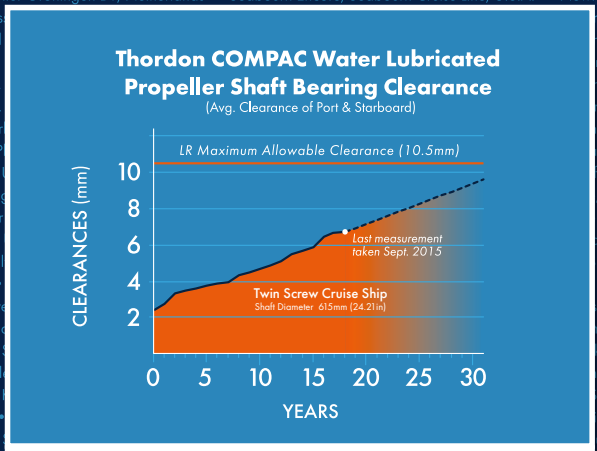

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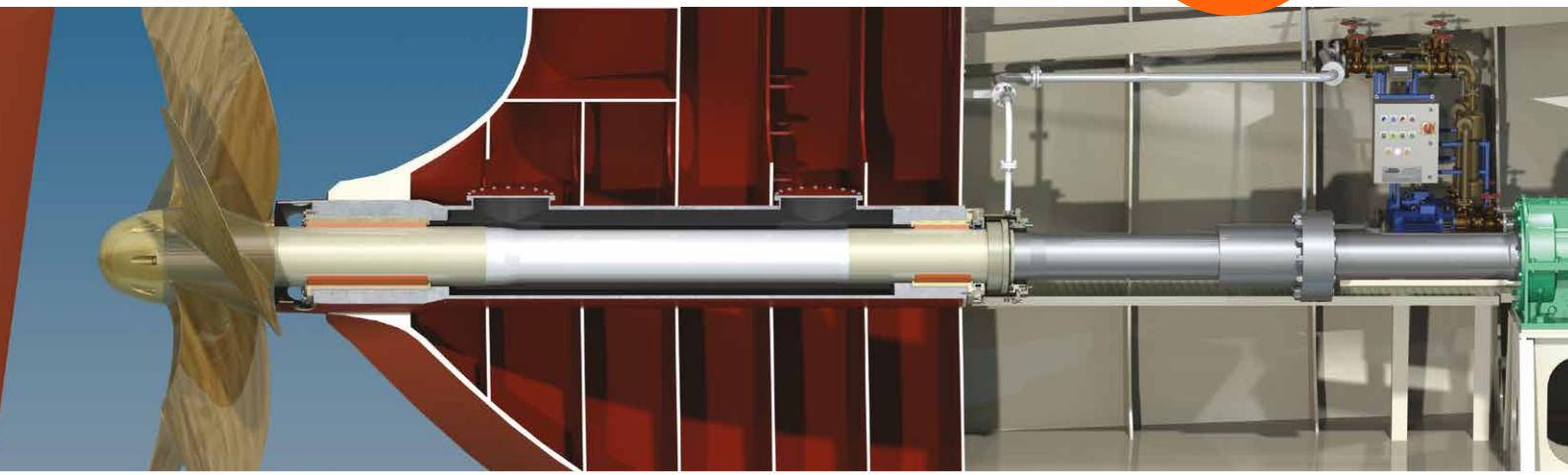

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Ship supply changing beyond all recognition

In 2014, former ShipServ manager Freddy Ingemann decided to put new ideas on the future of ship supply into practice.

As a result, he founded Moscord in 2016 - a company he calls the 'Maritime Amazon'. The e-Marketplace went live in August last year.

His idea was to basically transforms ship supply data into a standard format, which is then transferred into a platform before entering the market place. The aim was to produce the largest sales and distribution network in the ship supply sector to allow direct transactions between buyers, manufacturers, wholesalers and brand owners.

Data from around 100,000 suppliers are available on the platform amounting to 55 mill unique products. For example, the complete IMPA protocol can be accessed and consolidated via the internet data crowd sourcing platform.

Shipowners can enter the platform to trade and suppliers are invited onto the platform if not already joined. CEO and founder Freddy Ingemann told *Tanker Operator* that the company has worked on providing data on a lot of consumables and the idea was to reduce procurement resources. If there are three or four steps in the procurement chain, at least one could go wrong, he explained.

He claimed that 30-40% of a chandler's costs are involved with quotes, which goes back to the customer. "If a ship's engineer can see a catalogue, less resources are needed," Ingemann explained. That way a ship can receive the exact equipment or supply requisition ordered rather than receiving something that does not fit the bill.

For example, Sandvik Marine Services recently told *Tanker Operator*, that a very high percentage of equipment ordered is sent back, being the wrong size or type from that ordered.

Ingemann said that often suppliers don't know what exactly they are dealing with as they have to go through third parties. He also explained that brand owners often liked to know who is using their supplies or spares and by using the Moscord platform, the transaction is completely transparent, enabling data to be compiled in any context, but specifically for a vessel.

By using Moscord's system, owners can create sub-catalogues specifically for each ship and integrate Moscord's data into their own systems. This was described as a 'vessel data warehouse' whereby historical purchasing data can be cleaned up thus showing the demand per ship.

Pre-priced purchasing catalogues can be accessed, either vessel or port-based, both online and offline for shore and shipboard use. Vessels owned product data can be linked to the catalogue data and integrated with any system.

Deliveries are consolidated around hub ports. The company has signed a global contract with GAC to co-ordinate the deliveries. Thus far, Moscord has concentrated on Rotterdam, Hamburg, Bremerhaven and Shanghai with Houston to come soon.

At present, the company is incorporated in Singapore and has an office in Copenhagen with an operations centre in Manila.

Ingemann claimed to have received considerable interest from suppliers and was co-operating with ship chandlers. He said his company was different from ShipServ in that the latter is a transaction platform.

ShipServ research

As for ShipServ, the company recently has recently published the findings from its latest research whitepaper- 'e-procurement in Maritime; 2021 and Beyond'.

This research project analysed the current and future state of e-procurement within the maritime industry based on feedback from chief purchasing officers and managers (CPOs/CPMs).

It showed that while maritime e-procurement is currently at an embryonic level in terms of its evolution – scoring 'two out of 10' – one third of those surveyed believed the market will change beyond all recognition in the next five years, driven by developments in advanced technology and applications.

Former ShipServ manager Freddy Ingemann

Some 50% of CPOs and CPMs surveyed said that they still use their e-procurement systems for purely transactional – and not strategic – purposes. This is based on a number of key issues within the current market. For example, there is significant fragmentation with suppliers and buyers using different systems, many of which are archaic and not integrated nor have the functionality to interact or 'talk' with each other. They are also labour intensive to operate.

Despite this, 70% of those surveyed said that they realised more than 20% in time savings, as well as other OPEX benefits from their e-procurement system. They also reported the benefits of transparency, as well as the ability to track historical data. This demonstrates an understanding of, and appetite for, what a more sophisticated, digitalised e-procurement strategy can deliver, the company said.

A number of critical areas where maritime e-procurement will rapidly evolve was highlighted, to create a more

strategic approach to purchasing, which plays an important role in meeting one of the industry's biggest challenges; vessel optimisation and maximising the value of the asset for shipowners, operators and managers.

This includes a significant increase in functionality where there will be full transparency in relation to spend, improvements in automation and real-time, fleet-wide inventories. This will align purchasing power with tangible data, and importantly gives procurement teams sight of what is being bought and its value on a vessel-by-vessel basis across an entire fleet.

Intelligence

The ability to harness and unlock the true value of meaningful data will also create another step change; providing procurement professionals with actionable intelligence to consolidate and optimise their supplier base and moving more spend under contract, as well as embracing category management in order to take a more strategic approach to how procurement resources and processes are organised, concentrating on specific areas of spend.

Research also highlighted a number of core areas of technology development that has evolved in other more advanced markets outside of maritime, which will drive the necessary change in e-procurement in maritime over the next few years.

This includes a move from ERP-based systems to cloud computing systems that enable safe and secure application-based interfaces and central analytics that make automation easier and more cost effective. They also allow purchasing departments to share data directly with their supply chain, eradicating the problem of sharing data with suppliers who use different systems.

Blockchain will also be embedded into future systems, which will solve the challenge of siloed data, distributing data to known and identified members within an agreed network, and increasing efficiencies, because it uses a central, shared, secure record for storing data.

In conjunction with this, artificial intelligence (AI) and machine learning – tools, which ShipServ is already using – will also solve the problem of the current lack of standardisation where product descriptors are different from one buyer to another, by analysing and intuitively recognising specific products.

Kim Skaarup, CEO, ShipServ said: "While maritime e-procurement is at its early stage of evolution, our whitepaper clearly shows that the ideals for enhanced digitalisation, which will drive a more advanced and strategic model for

ShipServe's Kim Skaarup

e-procurement, are in easy reach. Speaking to procurement professionals, they know the opportunities that are out there and can see that they are close to unlocking the door to a universe of untapped savings, efficiency and value, which will redefine the nature of their jobs from largely administration to strategy, as well as transforming the whole supply chain. Critically, this will further drive e-procurement's fundamental role in the ecosystem for vessel optimisation." TO

Benefits of seawater-lubricated shaft bearings highlighted

Thordon Bearings recently published a study highlighting the commercial and environmental benefits of seawater-lubricated propeller shaft bearing arrangements.

This study indicated that shipowners can make substantial operational savings by switching from an oil lubricated shaft.

The study, presented at SMM 2018, was carried out in response to the increase in oil and oil-based environmentally acceptable lubricant (EAL) lubricated stern tube bearing failures, which are placing an additional and unnecessary financial burden on shipowners.

Despite the introduction of legislation to reduce shipping's impact on the oceans, together with shipowners' ever-present need to reduce opex, the majority of commercial deepsea vessels continue to use a system that is increasing risk and is costly to operate, Thordon said.

"It is quite staggering that over 95% of all new commercial ships continue to be built with oil lubricated propeller shafts – a system that is not only operationally expensive but environmentally questionable," said Craig Carter, Thordon Bearing's director of marketing and customer service.

"'Our Future, Our Ocean' paper presents the case for water lubrication to shipowners and shipbuilders as a commercially and technically viable way of increasing profits while achieving corporate sustainability goals," he added.

The 14-page report explains that while the low capex of an oil-lubricated system is an obvious attraction, any financial advantage is completely lost once the vessel enters the water. This is due to the costs associated with purchasing lubricating oils, regular maintenance and unscheduled drydockings required to repair or replace faulty shaft seals, Thordon claimed.

While emergency seal repairs alone can cost between $150,000 to $300,000, excluding drydocking costs, the paper pointed out that the constant topping up of an oil lubricated system, combined with the regularity of aft seal failure, can cost shipowners in excess of $6.5 bill over a 25-year period.

Thordon GSS shaft alignment services

In another move, Thordon Bearings is offering its COMPAC seawater lubricated propeller shaft bearing system with a lifetime bearing wear life guarantee, instead of the original 15-year wear life guarantee.

Performance data

This extended warranty is based on an extensive study of the performance data of the 550-plus COMPAC shaft bearings in operation on commercial vessels, dating back more than 25 years.

When the bearing operates in conjunction with Thordon's water quality package (that removes abrasives), ThorShield anti-corrosion shaft coating, shaft liners and SeaThigor forward seal, bearing wear is negligible, providing optimum through life performance, the company claimed.

Thordon's Global Service & Support (GSS) division has also added propeller shaft alignment services to its global technical support portfolio.

This new service completes the company's offering, providing shipowners with a one-stop-shop maintenance, installation and commissioning solution for Thordon's entire product portfolio.

For vessels experiencing vibration problems or other alignment issues, Thordon's GSS teams can be deployed to provide onsite shaft line investigation and measurement services to determine the load on the bearings. This includes in depth modelling of the shaft line, analysis of the stresses placed on the bearings and a complete review of the bearing height using strain gauges in order to optimise load distribution.

Several representative marketing agreements have also been signed recently, including coverage in Spain and the Baltic and Caspian seas. TO

New reactor introduced for PureBallast 3

With a new UV reactor of 1,500 cu m per hour, Alfa Laval has increased the installation flexibility of its ballast water treatment system (BWTS) PureBallast 3.

The new reactor, which handles 50% more volume, is claimed to be good news for tankers and other vessels with large ballast water flows. By enabling streamlined and cost-effective configurations, it will make UV treatment an even stronger competitor to electrochorination. Alfa Laval said.

The larger reactor joins an existing PureBallast 3 range that comprises 170, 300, 600 and 1,000 cu m per hour reactor sizes. Alone or in combination, the reactors enable BWTS system flows of 32–3,000 cu m per hour, with multiple systems handling even larger capacities.

This may strengthen a trend already seen in the tanker segment, where electrochlorination is giving way to UV ballast water treatment.

"Many shipowners are reconsidering what they've been told about ballast water treatment for large flows," said Anders Lindmark, Head of Alfa Laval PureBallast. "Heating needs, tanks for high-salinity water and the management of chemicals add size, complexity and cost for electrochlorination systems. PureBallast 3 is already highly competitive for large flows – and will be even more so with the 1,500 cu m per hour reactor."

PureBallast's large reactor

The preconception that electrochlorination is better suited to large flows than UV treatment is not rooted in the technology itself. UV treatment is chemical-free, poses no risk of corrosion and has lower operating costs. However, the setup offered by UV suppliers has not always been optimised for large flows. Even today, there are suppliers whose systems require four or more reactors to meet a tanker's needs.

"UV ballast water treatment systems can be both smaller and more cost-effective to install than electrochlorination systems, even for large flows," said Lindmark. "With the existing reactor portfolio for PureBallast 3, Alfa Laval has been in a strong competitive position and has received many orders for large-flow systems. But the new 1,500 cu m per hour reactor will provide an even better fit, right at the optimal intersection of biological effect, system size and power requirements."

Less reactors

Most importantly, the large reactor will mean a reduction in the already small number of reactors used by PureBallast 3 for large flows. A 3,000 cu m per hour system will be achieved with just two reactors, while a 1,500 cu m per hour system will go from two reactors to just one.

"The fewer the reactors involved, the lower the complexity and cost of installing the BWTS," Lindmark claimed. "For a system flow of 1,500 cu m per hour, for example, we've previously had to install reactor capacity for 2,000 cu m per hour. Now one reactor will do the full job, without over-dimensioning and with a considerable reduction in installation costs."

Costs relate not only to the reactor itself, but also to the connected piping, which may be as much as 600 mm in diameter. "There is a big difference in connecting pipes to one or two reactors instead of two or three, especially if the pipes are not straight," Lindmark explained. "When bending pipes or connecting them to a manifold, there is an additional radius to account for."

Lindmark also estimated that the total time for installation could be as much as 20% less, depending on the system and vessel configuration.

The new reactor will mean not only a reduction in footprint, but also improved OPEX through a substantial reduction in power consumption. When updating the range of PureBallast 3 configurations, however, Alfa Laval has also kept lifecycle cost in focus. Although it could be constructed with the larger reactor, a 1,200 cu m per hour system will be more energy efficient with two 600 cu m per hour reactors, thus ensuring the lowest costs over time.

"With five reactor sizes, we can fine-tune PureBallast 3 systems for any flow range," said Lindmark, who claimed that UV operating costs are already lower than those for electrochlorination systems. "When it comes to ballast water treatment for large flows, the 1,500 cu m per hour reactor doesn't just strengthen our offering. It truly changes the equation for UV."

Although reductions in cost and complexity are the key benefits of the larger reactor, they have not been the only factors focused on during its development.

"Scaling up to a new capacity is not a proportional exercise where all ratios remain the same," Lindmark explained. "Subtle changes may be needed to ensure the reactor retains its water turbulence and biological disinfection performance with a larger flow. And since the reactor is a pressure vessel, it must withstand corrosion and the forces placed upon it. The latter is one of the reasons we rely on super austenitic steel." TO

BEMA - Speaking with one voice

Talking with Coldharbour Marine's Andrew Marshall, who is also the secretary of the Ballast Water Equipment Manufacturers' Association (BEMA) at SMM, he explained that the association had grown to around 30 members.

BEMA was formed in April of this year to address ballast water treatment (BWTS) issues with a unified voice and bring clarity to the sector going forward, he said.

One of the associations' goals is to become a non-governmental organisation (NGO) at the IMO and also to provide cogent, sensible advice to the shipping industry.

He highlighted the fact that the US Coast Guard's (USCG) goalposts were changing. The manufacturers would rather see a time frame for change rather than just changing the rules.

Marshall claimed that within the membership, BEMA now has an excellent geographic and technical spread with members from across the US, Europe, Asia and the UK, plus other stakeholders.

"We've got to clean it up," he said, adding that the IMO's revised D-2 standards and the USCG initiatives were a step in the right direction.

BEMA President, Hyde Marine's Mark Riggio, explained; "We want to remind you that the compliance dates are rapidly approaching. Not simply the compliance dates for those vessels that trade in US waters, but also the dates for vessels flying the flags of any of the 76 countries signatory to the Convention, or any vessel trading in one of those countries.

"And while the USCG has historically been generous in issuing extensions to their compliance dates, that leniency is coming to an end. Perhaps more importantly, there is no mechanism in place for extensions to be issued for the Convention.

"Compliance dates have been set for one year from now. Under the Convention, each ship to which it applies, must meet the ballast water discharge standard (D-2) at their first IOPP renewal after 8th September, 2019. If vessels choose to do that survey earlier, they need to comply at that earlier date. There is no room for leniency, there is no room for extension," he stressed in an open letter on BEMA's website.

Using the SMM exhibition to gauge the market's views, Riggio said that while BWMS manufacturers in attendance reported strong interest, "firm orders are still very hard to come by."

There is also a fundamental misunderstanding among owners seeking compliance date extensions in an attempt to take advantage of BWMS that promise dual compliance with both IMO and stricter USCG regulations.

"Some owners are operating under the mistaken belief that they have more time to make decisions and that a USCG type-approval certificate is evidence that a system is suitable for all types of vessels, under all operating circumstances. The reality is that neither is the case. The IMO convention is in force now, and owners must start their selection process if they are to ensure compliance with international regulations," he said.

In the letter, Marshall confirmed."Detailed engineering, ship surveys, class approvals and many other factors extend the timeline for a retrofit to more than a year in typical cases."

Surveys maybe apart

Another problem is that an IOPP renewal survey might not coincide with a drydocking survey. This may mean that in order to install a BWMS during a scheduled drydocking, it will need to be installed before the actual compliance date. The benefit here is that there will be time to ensure that the equipment is working properly before the regulatory compliance date.

Riggio said that there had been issues with the early BWMS designs and some can be difficult to operate, and the equipment will affect a vessel's normal, pre-ballast water treatment operations. He thought that these questions had led many shipowners to delay the decision to install a system until the last possible minute in order to optimise the best chance for success.

Coldharbour Marine's Andrew Marshall

"If you have not installed a system on one of your ships, you absolutely need to now so you can learn how the system really works, how the (BWMS) company really performs, and what your crew needs to know before compliance is mandatory. There is a time to learn, but that time is not when ballast water is treated with the same stigma as oily bilge water," he warned.

Marshall thought that numbers of installations will ramp up late next year and beyond 2024, some equipment already installed will need retrofitting. "Not everything will work in all conditions," he said. "Uniquely, a BWMS could ruin and owner's day by failing a Port State Control inspection - for example, broken filters. Buy the right kit."

As for Coldharbour, testing of its unique in-tank, in-voyage inert gas-based UK MCA approved BWTS technology on board the 2013 TMS managed Suezmax 'Bordeira' has been completed. Land- based tests are due late next year.

TO

Is your system USCG type approved?

DNV GL has published a technical news piece, which discusses the ballast water treatment system (BWTS) specifications needed when a vessel is operating in US waters.

There are currently 65 BWTS models that are accepted as an AMS (Alternate Management System) by the US Coast Guard. This is a temporary acknowledgement of a flag state (IMO) type approval by the USCG. An installed AMS certificated BWTS can be used in US waters without a USCG type approval for a limited period.

When a BWTS manufacturer applies for an AMS, the company also commits to proceed with the type approval testing per the USCG requirements.

Currently, there are 13 USCG type approved BWTS as at the middle of November. By the end of 2018, this number will probably rise to 17. DNV GL has been involved (appointed as an Independent Laboratory by the USCG) in 10 of these systems.

As a general observation, the class society said its experience is that for most systems going through the USCG type approval testing, changes are made to the BWTS (or its operating procedures), compared to the model originally tested under the requirements of the BWM Convention.

This does not mean that the BWTS was poorly tested and certified by the flag state (IMO), but changes were made to also comply with the USCG requirements, DNV GL stressed.

Examples of changes are:

- The dose for treatment (eg amount of active substance [TRO] or UV-intensity).
- Automatic flow regulation to handle turbid (low UV-transmittance) water.
- Electric components to comply with environmental requirements (ship's working environment, eg vibrations).
- Software updates, for instance regarding control and monitoring, dosing philosophy or details for the treatment records.
- Use of alternative components, where 'equivalence' needs to be justified.
- Revised OMSM (operation, maintenance and safety manual).

The question then becomes, how this will affect a BWTS that was installed on a specific vessel before the system's USCG type approval was completed. To answer this, it is assumed that the vessel is operating in US waters and uses the BWTS (under an AMS).

Does the USCG type approval apply to this vessel's installation the same day the type approval is granted by the USCG? The general

answer is - no.

It is understood that a vessel has time until the AMS expires for an installation, which is five years after the vessel's compliance date or extended compliance date. Before the compliance date, the vessel shall be provided with a copy of the USCG type approval certificate and an updated nameplate on the BWTS.

Before the BWTS nameplate is changed, it is of paramount importance that the BWTS model installed is identical to the one that was type approved, the class society stressed.

There is a great share of responsibility resting on the shoulders of the BWTS manufacturer to ensure that components, software, operating procedures and documentation are in accordance with the USCG type approval certificate.

In most cases, an upgrading kit is needed. What has been undertaken should be documented on board, during an upgrading, before the USCG type approval certificate and nameplate are awarded.

No installation/initial survey of the BWTS is required by the USCG and compliance, to DNV GL's understanding, will be verified within the USCG vessel inspection scheme.

There are today more than 5,000 systems installed and many of them will eventually need the USCG type approval certificate to undertake discharge operations in US waters.

DNV GL recommended that all shipowners request a statement from the BWTS manufacturer to confirm that a system, already installed on a vessel and given a new nameplate referring to the USCG type approval, is 'identical' to the model that was USCG type approved.

USCG stance

At September's Ballast Water Management and Technology North America conference, USCG staff from the Office of Operating and Environmental Standards and the Marine Safety Centre (MSC) gave an update on the USCG's ballast water programme.

Regina Bergner, an environmental scientist, gave an overview of the Office of Operating and Environmental Standards (OES) organisational changes as one way to improve the communication flow within the programme.

She also briefly discussed the final rule, published recently, which eliminates the annual reporting requirement for vessels operating exclusively in one Captain of the Port zone.

Bergner then explained that after completing extensive feedback from industry stakeholder groups, the USCG had moved from implementation to compliance because of the availability of type approved systems.

Alfa Laval's PureBallast family was the second to gain a USCG type approval certificate after Optimarin

"We view invasive species and ballast water control technologies the same as we do any other pollution prevention equipment and take a similar enforcement stance," she said. Shipowners and operators should identify and plan for contingencies in the vessel's ballast water management plan; the plan should outline procedures to be followed when the preferred ballast water management method is not available.

"If you have a problem and contact the Captain of the Port, the first thing they're going to want to know is what's in your ballast water management plan," Bergner said. "If there are safety or operational issues, the nearest Captain of the Port can help you sort those out, but understand cargo operations may be delayed or the voyage deviated in order to achieve compliance."

Matthew Reudelhuber of the US Office of Operating and Environmental Standards discussed several key aspects of the compliance extension programme, which allows the USCG to extend a vessel's compliance date.

The extension programme was established to assist shipowners and operators in complying with US regulations; such as the alternate management system (AMS) programme. It was also established as a bridge to provide support for those vessels needing to install a BWMS when no US type approved systems were available.

In addition, no extensions will be granted to install an AMS, nor will one be granted for vessels already equipped with an AMS. Vessels can comply with the regulations by operating the AMS for up to five years after the original or extended compliance date.

Reudelhuber said the USCG has about 12,500 active extensions, two-thirds of which were granted in 2016 when no type approved systems were available. Most of these extensions will expire between 2021 and 2024, which aligns with the end of the IMO experience-building phase. He said most of the global fleet will likely be in compliance within the next five years.

"It's harder to justify extensions because more compliance options are available," Reudelhuber said. The USCG stressed that delay is not an acceptable compliance strategy. Only in those cases where compliance is not possible, are extensions granted. In each of these cases, the vessel's representative is required to show that all possible steps are being taken toward compliance.

Type approval programme

Lt Jacob Baldassini, MSC engineer, gave an overview of the USCG's type approval programme, including its resources, the timeline for type approval, and programme goals.

The type approval timeline begins once MSC receives a complete application, according to the requirements set in the regulations. Once the application is deemed complete, there are eight areas MSC must consider during the type approval application process: design and construction; engineering; the operation, maintenance and safety manual; the independent lab test report; land-based testing; shipboard testing; component testing; and scaling.

Baldassini said MSC's goal is to provide the applicant with initial comments for each of the eight areas within 30 days of receiving the application.

"Not all foreign vessels are subject to the same US inspection standards [as domestic vessels], so systems that have not demonstrated compliance with those sub-chapters may still receive type approval," Baldassini said. "Those systems' certificates will state that the BWMS is not intended for installation on US vessels."

Baldassini also dispelled the myth that BWM systems can be a 'plug and play' system by stressing that it is imperative for BWMS owners/operators to understand the system and be intimately familiar with the parameters found in the operational and maintenance safety manual.

TO

Trends, trials and tribulations in ballast water market

The enforcement deadline for the Ballast Water Management Convention (BWMC) is beginning to draw near, warned Dr Stelios Kyriacou, General Manager of BALPURE BWMS at De Nora.

The expected 2021-22 peak installation period for ballast water treatment systems (BWTS) is looming particularly given the potential 18-month project lead time for installation. Owners need to be securing their partnerships now to enable a simple transition towards compliance.

When it comes to cementing these partnerships, there are some emerging obstacles that impact both sides. The significant practical, management and financial challenges that owners face must also be addressed by BWTS manufacturers.

The biggest trend we're witnessing is the emergence of a price war between manufacturers, driven by the demands of CAPEX-sensitive owners. The reality is that although the message from manufacturers and suppliers is all about finding the right system, the incoming questions aren't about applicability or maintenance requirements – they are about price and owner benefits. Questions about supplier managed turnkey installation comes in at a close second.

The pressure from owners to receive a low-cost, high-quality solution is causing significant ructions in what is still a nascent market. Suppliers, who only recently had their sales, growth and scalability projections stretched by two years following industry lobbying at the IMO, are now being asked not only to fully manage ship retrofit projects from end to end, but also to do it at scale for multiple owners while driving the price as low as possible.

This is a complex equation even for established companies like De Nora, who can draw upon the expertise, scale and manufacturing capacity of other business areas and our 90-year history. However, for emerging specialist and still scaling BWTS manufacturers, despite the fact that they may offer the best solutions for some ship types and operating profiles, these expectations could bar them from consideration, which is not in the best interests of the shipping industry.

In order for shipowners to make informed decisions, the sector needs to nurture a more open and honest, informative environment. This is where the Ballastwater Equipment Manufacturers' Association (BEMA) could have a significant impact. Sharing applied knowledge to ensure a fuller comprehension of the technologies available will educationally bolster the industrial segment. BEMA aims to act as the industry's source of technology information and share its experience and expertise with shipowners and regulators alike to work towards a smooth implementation of the BWMC.

Owners and operators might think that this is great for them as manufacturers compete with each other to offer whatever solution they can at the lowest possible price. However, the reality is that this could cripple suppliers in the medium- to long-term. A low pricing strategy is a mechanism of stimulating demand and gaining market share and does not assure the long-term solvency of suppliers especially those single product companies.

Life cycle costs

In a retrofit scenario, if owners are investing in BWTS, it's clear they're expecting a further 10 plus years of operation for those ships. However, it's critical that they stop thinking about what they will pay for the installation alone and give due consideration to life cycle costing. A low-cost BWTS with meagre operational availability would be a poor decision compared to a system that is a good fit to the ship's operational profile, with enhanced availability and reliability, but requiring a higher upfront cost.

Manufacturers developing the lowest priced specification to engage in a price war with competitors means compromise – either on

De Nora's BALPURE BWTS

durability, efficiency or, in some cases, both. That means more spend on maintenance and spare parts, greater energy expenditure and higher fuel costs for owners in the long-run. Manufacturers can also charge owners less by offering less after care and fewer support services, and there's a risk that increased commoditisation will encourage a 'fit and forget' mentality amongst suppliers. This would be a disaster for owners and operators.

Shipowners have noted a lack of equipment choice at the shipyards, but they are not willing to pay the price difference or accept some logistical challenges for their first choice equipment. A notable trend is that shipyards in the Far East promote their own or locally sourced BWTS. It is very rare that any makers from the rest of the world are included in the makers lists.

They have repeatedly reported that they have been forced to accept shipyard choices, due to the very severe price penalties applied by shipyards for design changes. Logic would suggest that when choosing a piece of equipment that dictates the long-term regulatory compliance and operations of your ship, owners should more readily accommodate price or installation timescales than optimal effectiveness and reliability. TO

Plan an installation properly

At a recent round table in London, Anna Ziou, the UK Chamber of Shipping's (CoS) policy director of safety & environment advised that BWTS installation work should be based on quality, as well as the cost and time involved.

She said that when considering an installation, owners should be aware of the quality issues. For example, chemicals might be difficult to source worldwide, a lack of training could be a problem and contingency plans should be drawn up.

In the UK, for instance, if a system fails, a vessel will not be allowed to discharge ballast water. In a recent survey, the UK CoS found that 57% of its members had already installed a BWTS in at least one vessel.

DNV GL's environmental technical advisor Per Holmvang said for a vessel of 18-20 years age, it was not economically viable to retrofit a system on board.

He agreed that competence coming from training was underestimated, due to concerns over complex chemical process plants being installed.

Holmvang described class focus as ensuring the safe installation on board, the pressure vessels, piping, electrical installation, control systems, marine equipment standard, environmental testing and HSE issues.

Willem Visscher, Goltens manager engineering and business development said that the engineering company had fitted 430 BWTS thus far. He confirmed that an installation should be planned properly, from start to finish.

The initial planning should include a 3D scan of the area where the BWTS will be installed and all stakeholders should be involved in the planning process.

Optimarin's CEO Tore Andersen

Optimarin's CEO Tore Andersen said that roughly 50% of the BWTS problems concerned the equipment and the other 50% the crew. "Owners were not training their crew," he said. Optimarin has BWTS training facilities in Mumbai and Manila in co-operation with Anglo-Eastern.

Feedback is requested from owners thus enabling KPIs to be established.

He said that an installation roughly takes six months from concept to operation but the company can supply a system in six to eight weeks if the suppliers can forward the equipment in what it calls a 'Fast Track' operation. Optimarin buys everything in and sends an installation forecast to the suppliers every two months. The company usually has at least two suppliers for each component.

However, today engineering is a problem causing a bottleneck, which can result in nine months lead times. Andersen advised owners to clean the ballast tanks at the same time as installing a BWTS.

The company can produce installation and operations manuals tailor made for each vessel, as even sisterships will often have a different machinery layout, including piping.

Through the company's Optilink system, an engineer sitting in Stavanger can look into the system and advise the crew on how to set the alarms, etc. He said the electronics set up is difficult so tends to be the most important part of the system.

Optimarin hopes to introduce computer-based training (CBT) by the end of this year to train technicians. He advised owners with a fleet of 30 or more vessels to have at least two experienced engineers able to go on board and train the crew.

He said that around a total of 6,000 systems had been installed thus far worldwide.

Recently, Optimarin secured one of its largest orders to date to supply 36 systems to Ardmore Shipping. The units will be fitted on 18 chemical and product tankers, with deliveries due to commence in February next year.

Ardmore will fit two Ex proof units in each vessel.

The OBS units, the first systems in the market to achieve full USCG approval, will be fitted on a rolling basis across selected partner shipyards with whom Ardmore has existing relationships. TO

MSC issues 13th BWTS Approval certificate

Since the table on Page 25 was compiled, the USCG Marine Safety Centre has issued another BWTS Type Approval certificate.

The 13th certificate was issued to JFE Engineering Corp after a detailed review of the manufacturer's type approval application determined the system met the requirements of 46 CFR 162.060.

The treatment principle of the BallastAce BWMS consists of filtration with chemical injection during uptake and neutralisation during discharge.

This approval covers models with maximum treatment rated capacities of between 500 and 3,500 cu m per hour.

As mentioned, there could be more announced by the time this issue is published.

TO

USCG Marine Safety Centre BWMS Type Approval status

Approved

Application Received	Manufacturer (Country)	Model	Independent Laboratory	System Type	Capacity	Certificate Issued* (Amended)
20 Sep 2016	Optimarin (Norway)	OBS/OBS Ex	DNV GL	Filtration + Ultraviolet	167 – 3,000 m3/h	02 Dec 2016 (03 Nov 2017)
21 Sep 2016	Alfa Laval (Sweden)	PureBallast 3	DNV GL	Filtration + Ultraviolet	150 – 3,000 m3/h	23 Dec 2016 (21 Dec 2017)
23 Sep 2016	TeamTec OceanSaver AS (Norway)	OceanSaver MK II	DNV GL	Filtration + Electrodialysis	200 – 7,200 m3/h	23 Dec 2016 (18 Oct 2017)
24 Jan 2017	Sunrui (China)	BalClor	DNV GL	Filtration + Electrolysis	50 – 8,500 m3/h	06 Jun 2017 (05 Jan 2018)
31 Mar 2017	Ecochlor, Inc. (USA)	Ecochlor BWTS	DNV GL	Filtration + Chemical Injection	500 – 16,200 m3/h	10 Aug 2017 (26 Apr 2018)
02 May 2017	ERMA FIRST (Greece)	Erma First FIT	Lloyd's Register	Filtration + Electrolysis	100 – 3,740 m3/h	18 Oct 2017 (25 Sep 2018)
31 Oct 2017	Techcross, Inc. (Republic of Korea)	Electro-Cleen	Korean Register	Electrolysis	150 – 12,000 m3/h	05 Jun 2018
28 Sep 2017	Samsung Heavy Industries Co., Ltd (Republic of Korea)	Purimar	Korean Register	Filtration + Electrolysis	250 – 10,000 m3/h	15 Jun 2018 (20 Jul 2018)
12 Mar 2018	BIO-UV Group (France)	BIO-SEA B	DNV GL	Filtration + Ultraviolet	55 – 1,400 m3/h	20 Jun 2018
09 Apr 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius EC	DNV GL	Filtration + Electrolysis	250 – 4,000 m3/h	30 Aug 2018
31 May 2018	Hyundai Heavy Industries Co., Ltd. (Republic of Korea)	HiBallast	DNV GL	Filtration + Electrolysis	75 – 10,000 m3/h	26 Oct 2018
09 May 2018	Headway Technology Co., Ltd. (People's Republic of China)	OceanGuard	DNV GL	Filtration + Electrolysis	65 – 5,200 m3/h	06 Nov 2018

Under Review

Application Received	Manufacturer (Country)	Model	Independent Laboratory	System Type	Capacity	Certificate Issued* (Amended)
03 Mar 2018	De Nora (USA)	BALPURE	Lloyd's Register	Filtration + Electrolysis	400 – 7,500 m3/h	Pending
16 Mar 2018	Alfa Laval (Sweden)	PureBallast 3	DNV GL	Filtration + Ultraviolet	150 – 3,000 m3/h	23 Dec 2016 (21 Dec 2017)
22 Mar 2018	Optimarin (Norway)	OBS/OBS Ex	DNV GL	Filtration + Ultraviolet	167 – 3,000 m3/h	02 Dec 2016 (03 Nov 2017)
29 Mar 2018	JFE Engineering Corporation (Japan)	BallastAce	Control Union	Filtration + Chemical Dosing	500 – 3,500 m3/h	Pending
30 Mar 2018	Panasia Co., Ltd. (Republic of Korea)	GloEn-Patrol	DNV GL	Filtration + Ultraviolet	50 – 6,000 m3/h	Pending
20 Jul 2018	Envirocleanse, LLC (USA)	inTank	DNV GL	Electrolysis + Chemical Injection	Up to 200,000 m3	Pending
30 Aug 2018	NK BMS Co., Ltd. (Republic of Korea)	NK-O3 BlueBallast II	Lloyd's Register	Ozone	200 – 8,000 m3/h	Pending
27 Sep 2018	NK BMS Co., Ltd. (Republic of Korea)	NK-O3 Blue-Ballast II Plus	Lloyd's Register	Ozone	200 – 8,000 m3/h	Pending
18 Oct 2018	DESMI Ocean Guard A/S	CompactClean	Lloyd's Register	Filtration + Ultraviolet	135 – 3,000 m3/h	Pending
19 Oct 2018	Wärtsilä Water Systems, Ltd. (UK)	Aquarius UV	DNV GL	Filtration + Ultraviolet	50 – 1,000 m3/h	Pending
19 Oct 2018	Cathelco Ltd. (UK)	Evolution	Lloyd's Register	Filtration + Ultraviolet	34 – 1,500 m3/h	Pending
23 Oct 2018	Techcross, Inc. (Republic of Korea)	Electro-Cleen	Korean Register	Electrolysis	150 – 12,000 m3/h	05 Jun 2018 (Pending)

*Some manufacturers have requested multiple amendments to their Type Approval Certificates. The first date is the date when the original certificate was issued, and the date in parentheses is the date of the current amendment. *Source: USCG MSC*

Planning for an EGCS fitting

In a recent meeting, attended by *Tanker Operator*, DNV GL said that as of 1st November, there were 2,137 vessels, which either had an exhaust gas cleaning system (scrubber) fitted or had ordered a system, up to 2023.

IMO has decreed that the carriage of non-compliant fuels will be banned as from 1st March, 2020, unless the vessel is fitted with a scrubber. Hence a vessel could still burn HFO, despite the low sulfur cap.

DNV GL said of these, 204 were crude carriers and 321 described as oil/chemical vessels. The open loop type was the most popular with 1,642 vessels opting for this solution, despite murmurings about wash water and efficiency, etc.

However, this type is deemed to be the most practical and economic solution and the majority of open loop installations are closed loop ready, allowing them to be converted into a closed system at a later stage.

Retrofits were more popular than newbuildings and somewhat surprisingly, we have seen at least two tanker companies investing in scrubber suppliers to cover their needs.

There are more than 20 different scrubber suppliers with confirmed projects. The three largest suppliers - Wartsila (478), Alfa Laval (321) and Yara Marine (251) - hold over 50% of the market share, according to DNV GL's figures.

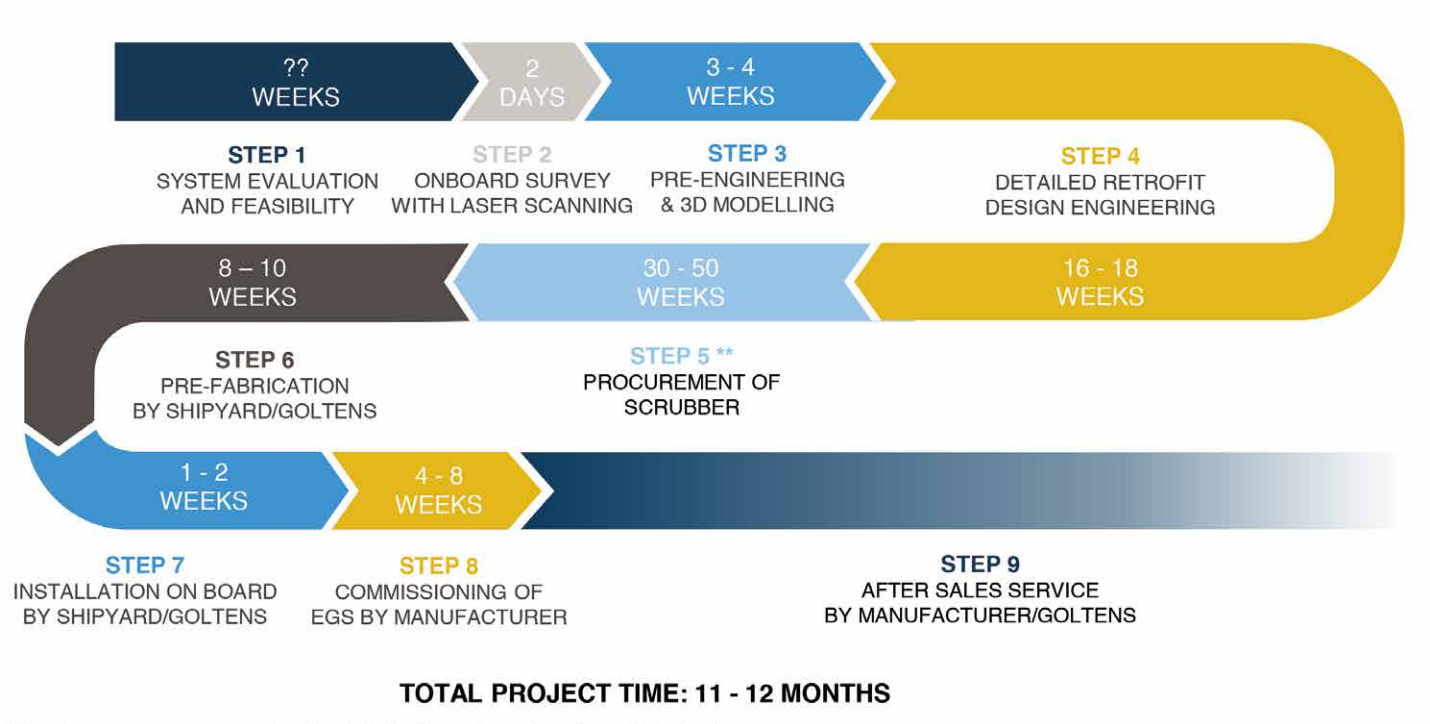
As mentioned, there are looming problems, as Connecticut, Belgium, and some ports in Germany have banned wash water discharge and Sweden, Norwegian Heritage Fjords and some other regions are also considering a ban. Furthermore, California and Antarctica have banned the use of high sulfur fuel.

But, one thing is certain, DNV GL said. Scrubbers can significantly mitigate the cost impact from the 2020 sulfur cap when compared to the switch to other available solutions, including low sulfur fuel and LNG, which are much more expensive.

Depending on the price differential with other types of fuel, a scrubber system could have a payback time of around 12 months, manufacturers claim.

The class society has published a shipowner´s checklist when considering the installation of scrubbers:

- Perform a thorough financial assessment to evaluate if the installation of scrubber is a feasible option. The outcome of the assessment particularly depends on the price differential between compliant fuel and high sulfur fuel oil (HSFO) and the future availability of HSFO. However, also the trade pattern, cost of increased power consumption, maintenance and repair costs, costs for alkali and sludge disposal, and possible market rewards should be considered.
- Perform a thorough technical study to assess if the installation of scrubbers is feasible. Items to be considered include - space for the installation and foundations, additional power consumption, routing of pipes, possible alternations of the fire integrity, and impact on stability (weight). When performing the technical study, local legislation for the operation of scrubbers should also be considered, as the usage



Typical time chart scrubber installation. Source: Goltens

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of the selected scrubber type might be restricted in certain ports, as mentioned above.

- Select scrubber supplier. Due to the recent boom in scrubber ordering , the dominant market players might not be in the position to offer a suitable slot for an installation. If a not-so-prominent supplier is chosen, ensure the supplier meets quality standards and provides in-service support globally.
- Select a Continuous Emission Monitoring System (CEMS) supplier. When selecting the scrubber supplier, also carefully select the CEMS supplier, which in practice is paramount to prove that the EGCS is running in compliance, for instance for port state control. Malfunctioning CEMS (eg wrong recordings) will result in non-compliance and possibly high fines.
- Select a dockyard. Likewise, the selection of a suitable slot at a potential dockyard might be challenging today. In almost all cases, the installation of scrubbers requires modification of the sea chest, thus a drydocking of the vessel. To minimise the offhire time, the drydocking could be considered during a class renewal as a suitable time to install the scrubber.
- Plan the commission test. A well-planned commission test with all parties involved (scrubber supplier, CEMS supplier, docking yard, class society) is paramount for the successful survey and testing of the scrubber to demonstrate compliance with the requirements stipulated by IMO. It is recommended to call for another meeting before testing than to try to sort things out after the sea trials.

The integration with other shipboard system should also be taken into account. Project management and planning is of vital importance.

The installation's approval depends on the quality of the drawings and the related design, which again is reflected in the understanding of the rules, both statutory and class.

Requirements

DNV GL has developed a list of required documents (a DocReq) for the different types of EGCS and affected systems. This lists a minimum of drawings that should be submitted for approval. The document will be sent upon request when applying for approval. The approval process should be initiated at least three months before scheduled installation to account for any comments to be handled.

The scrubber is subject to a function and safety test after installation on board. In addition to the required function and safety tests (eg pumps, piping, bypass, control and monitoring system, alarms) as per class society rules, the EGCS shall also be surveyed and tested in accordance with the requirements of IMO Res. MEPC.259(68).

After a successful on board survey and testing, the ship's International Air Pollution Prevention (IAPP) certificate will be amended with the scrubber.

At the meeting, Goltens Willem Visscher said that the planning and installation could take anywhere between 30 and 50 weeks to commissioning (see page 26).

He advised companies to arrange a 3D laser scan of the area where the EGCS is to be fitted possibly up to a year in advance and warned that sister vessels could have a different machinery layout so it was advisable to conduct a scan on each vessel. The equipment could weigh up to 25-30 tonnes including water, he said.

Visscher also said that the installation could be undertaken using a riding crew while the vessel is afloat but that this needed careful planning.

He called for a lot more communication between all those involved, including with the installation engineers from the office.

If considering a ballast water system and a scrubber installation at the same time, avoid mixing the different pipe work, he said.

To cope with BWTS and EGCS retrofits and newbuilding work in particular, Goltens has increased its capacity by up to a factor of four and Visscher admitted that more engineering expertise was needed. TO

How to comply with the low sulfur cap

As 1st January, 2020 draws ever closer, there is no clear favourite emerging from the three or four methods of attaining the IMO's low sulfur emissions level.

There has been plenty of advice emanating from several camps and lobby grpups have been formed in favour of exhaust gas cleaning systems (scrubbers), LNG as a fuel and others.

A few weeks ago, DNV GL issued a white paper assessing a range of alternative fuels and technologies. Entitled 'Alternative fuels and technologies for greener shipping', the paper examined the cost, availability, regulatory challenges and environmental benefits of alternative fuels and technologies.

The IMO's decision to limit the sulfur content of ships fuel from 1st January, 2020 to 0.5% worldwide, and the recently adopted resolution to reduce greenhouse gas (GHG) emissions by 50% by 2050, will change the future mix of ship fuels dramatically.

The combined amount of heavy fuel oil (HFO) and marine gas oil (MGO) consumed by ships accounts for no more than 25% of total global diesel fuel and petrol production (2016 figures).

This is roughly equivalent to the amount of energy consumed using liquefied natural gas (LNG), which stands at 24%; however, LNG represents only a small portion (about 10%) of the overall gas market.

Assuming an installed base of about 4,000 scrubbers in 2020, no more than 11% of ship fuel usage will be high-sulfur fuel, DNV GL calculated. Latest estimates assume that no more than 2,000 scrubber installations will be carried out between now and 2020.

This raises the question whether high-sulfur fuel will even be available outside the largest bunkering ports if only 4,000 or even fewer ships will be able to use it. The next question is what the price differential between HFO and compliant fuels will be.

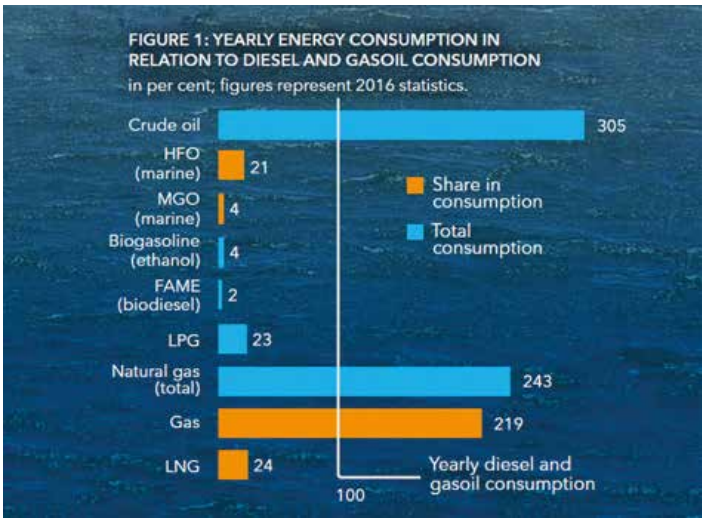
Among the proposed alternative fuels for shipping, DNV GL identified LNG, LPG, methanol, biofuel and hydrogen as the most promising solutions. Among new technologies, the class society believed battery systems, fuel cells and wind-assisted propulsion to offer potential for ship applications.

Fuel cell systems for ships are under development but will take time to reach a level of maturity sufficient for substituting main engines. Battery systems are finding their way into shipping; however, on most seagoing ships their role is limited to enhancing efficiency and flexibility. Wind-assisted propulsion, while not a new technology, will require some development work to make a meaningful difference for modern vessels.

When it comes to CO2 emissions, LNG is the fossil fuel, which produces the lowest amounts. However, the release of unburned methane (methane slip) could reduce the benefit over HFO and MGO in certain engine types. Methane (CH4) has 25 to 30 times the greenhouse gas effect of CO2.

Nevertheless, engine manufacturers claim that the tank-to-propeller (TTP) CO2-equivalent emissions of Otto-cycle dual-fuel (DF) and pure gas engines are lower than those of oil-fuelled engines.

If produced from renewable energy or



Yearly energy consumption relation to diesel and gasoil consumption (2016 figures). Source: DNV GL

biomass, the carbon footprints of methanol and hydrogen can be significantly lower than those of HFO and MGO.

The cleanest fuel, hydrogen, produced using renewable energy and liquefied hydrogen could be used in future shipping applications. However, because of its very low energy density it requires large storage volumes, which may prevent it from being used directly in international deepsea shipping.

In a sustainable energy world, where the entire energy demand is covered by renewable, CO2-free sources, hydrogen and CO2 will be the basic ingredients for fuel production, most likely in the form of methane or diesel-like fuels produced in a Sabatier/Fischer-Tropsch process.

The Sabatier process is a reaction between hydrogen and carbon dioxide at elevated temperatures – optimally 300 to 400 deg C – and pressures in the presence of a nickel catalyst to produce methane and water. An alternative, the Fischer-Tropsch process converts a mixture of carbon monoxide and hydrogen into liquid hydrocarbons in a series of chemical reactions.

Looking ahead, LNG has already overcome the hurdles of international legislation, and methanol and biofuels will follow suit very soon. It could be a while before LPG and hydrogen are also covered by appropriate new regulations within the IMO IGF Code.

The existing and upcoming environmental restrictions can be met by all alternative fuels using existing technology. However, the IMO target of reducing GHG emissions by 50% by 2050 is ambitious and will likely require widespread uptake of zero-carbon fuels and further energy efficiency enhancements. Fuel cells can use all available alternative fuels and achieve efficiencies comparable to, or better than, those of current propulsion systems.

However, fuel cell technology for ships is still in its infancy. Promising and advanced projects are, eg, those running under the umbrella of the e4ships lighthouse project in Germany, with Meyer Werft and ThyssenKrupp Marine Systems heading the projects for seagoing ships.

Wind-assisted propulsion could potentially reduce fuel consumption, especially when used for slow ships, but the business case remains difficult. Batteries as a means of storing energy can be considered as an alternative fuel source in the widest sense. Especially on ships operating on short, regular voyages, they have major potential as a means to boost the efficiency of the propulsion system. In deepsea shipping, batteries alone are not an adequate substitute for combustible energy sources.

With low-sulfur and alternative fuels becoming more widely available, the well-known combined-cycle gas and steam turbine technology as used in the PERFECt Ship project represents a viable alternative for high-power ship propulsion systems, DNV GL said.

DNV GL's environmental technical advisor, Per Holmvang warned at a meeting in London recently that a revamped ISO 1827 standard would not be ready until 2022. An ISO working group is currently looking at fuel stability and instability, among other potential problems and hopes to prepare advice by May of next year.

"Fuel batches from different geographical areas pose a big question mark," he said. There is a danger of mixing fuel from say Rotterdam, Singapore and elsewhere and getting sludge.

The ideal answer is segregated fuel tanks for different stems but of course the average ship is not fitted with several tanks.

At the meeting, the UK Chamber of Shipping's Anna Ziou explained that the IMO is drafting guidelines on enforcement by Port State Control officers in an attempt to get a level playing field.

Included in guidelines will be a fuel oil non-availability report (FONAR) template. However will it cover safety issues, she asked. She expressed concern about the safety of new fuels coming onto the market and also said that it would take around six months to train crew properly in handling new fuels.

She said that the UK had already adopted a bunker supply licensing scheme and the CoS was trying to persuade IMO members to adopt a similar scheme "…to promote higher standards in the supply chain," she explained.

An SCF Aframax recently bunkered LNG in Rotterdam

Condition monitoring

In preparation for 2020, Wilhelmsen Ships Service (WSS) recommended that owners and operators address the stability and compatibility issues associated with new low sulfur, hybrid, and blended fuels head-on.

To meet demand after 1st January, 2020, in addition to low sulfur distillates, the bunker market will also include a number of new hybrid and blended fuels.

Being new to the market, it will become essential to understand just how these fuels will impact fuel systems and engines. Typical challenges associated with such hybrid and blended fuels revolve around stability, compatibility, catalytic fines, lowered lubricity, or sludge build up, WSS warned.

Ranging from a persistent inconvenience in the engine room to a major situation, fuel issues can cause excessive wear and tear to engines, reduce combustion, and in the worst cases, even cause loss of power.

Jonas Östlund, WSS product marketing manager, oil solutions, believed that regular fuel testing allows crews to gain a better understanding of the fuel quality, and a clear picture of the severity of the fuel issues they face.

He said, "Analysing fuels and understanding fuel performance through condition monitoring is critical and is quite simply the best way to avoid costly damages and engine failures."

When the global fleet is regularly operating on 0.5% sulfur heavy oil, and its lighter or blended grades, after 2020, Östlund said that stability and compatibility will be the biggest risk factor.

"Instability in fuel, if unrecognised and unchecked, can cause severe problems, such as sludging of the fuel tanks, filter blockages and excessive sludging of the purifier," he explained in an industry note.

WSS claimed that its stability test kit was specifically designed to resolve these problems. Crews can quickly test the fuel for stability on board and then immediately treat the problem areas with the right additive, to ensure that fuels remain stable throughout storage.

Östlund added, "Regular testing is key to reducing the risks inherent with such fuels, as it allows the crew on board to understand the changing stability of the fuel whilst in storage on board the ship."

Part of WSS tailor-made low sulfur fuel treatment range, the Unitor Fuel Oil Stability

Test Kit provides a stability number in accordance with ASTM D7160. It is a simplified version of the ASTM test, but in just 10 mins will provide a quick indication of the fuel stability, showing how easily or quickly the fuel falls apart and the likelihood it will produce large amounts of sludge, the company claimed.

Switchover process

Ensuring compliance with the low sulfur cap isn't just about fuel selection; the actual switchover process from heavy fuel oil (HFO) to new, low-sulfur alternatives needs careful management, ExxonMobil has warned.

First, operators will need to ensure that their fuel tanks do not contain high-sulfur HFO by the IMO deadline. Fuel tanks will probably retain sediment from previous bunkers, which is likely to contain high levels of sulfur. If this is not removed, there is the risk that it will contaminate compliant fuel, pushing its sulfur content above the 0.5% limit.

ExxonMobil said that it expected that many compliant fuels entering the market will have sulfur content very close to the 0.5% cap, so even very low levels of residual sulfur left in a fuel tank could tip a vessel over the IMO's limit.

An LNGC being bunkered with heavy fuel oil in Gibraltar

To minimise this risk, ExxonMobil recommended that vessel operators flush fuel tanks with a distillate-based product to help remove sludge deposits. This process may need to be repeated, depending on the amount of residue present. In some instances, tank bottoms may have to be manually cleaned.

Vessel operators must factor in how long these processes could take and keep in mind that any sludge removed from the tanks will need to be disposed of properly.

Both ExxonMobil and Shell said that they are ready to supply low sulfur fuels, among others.

For example, ExxonMobil confirmed that all its IMO compliant, 0.5% sulfur fuels developed to date are residual grades. The fuel and lube supplier has also announced specification details and confirmed that the formulations are all compatible with each other, provided that bunkering, storage and handling best practice guidance is followed.

Fuels have all undergone rigorous fit-for-use assessments, ExxonMobil said. The specifications will range from RMD 80 to RMG 380, with a density of between 900 and 970 at 15 deg C. Catalytic fine content will meet the level set out in ISO 8217:2017.

The combination of these characteristics will help ensure that vessel operators can continue to operate their main engines, auxiliary engines and boilers safely and efficiently when they switch over to low sulphur fuels, the company said.

New lubricants may be required by the vessel operator depending on the chosen compliant fuel. In order to meet the needs of a truly multi-fuel future, ExxonMobil will also provide a complementary range of cylinder and engine oils.

Meanwhile on 3rd October, Shell global marine fuels network launched the fuel availability plan for key ports in 2020 at SIBCON, Singapore.

The availability for Shell's new 0.5% very low sulphur marine fuel oil (VLSFO) was included as part of the rollout. Trials for the new fuel were ongoing with customers in Rotterdam, Singapore, and New Orleans.

Changing liability

Liability is also a key issue going forward with P&I clubs in particular taking a keen interest.

To help alleviate this, BIMCO has developed two 2020 bunker clauses that deal with general compliance and the transitional period.

The clauses were due to be released in early December.

Despite problems, Aegean looks to have secured its future. The company has a major presence in Gibraltar

The 'Global Marine Fuel Sulphur Clause for Time Charter Parties' was approved by the Documentary Committee at its meeting in Copenhagen on 13th November.

"It is very important that the new sulfur clauses are ready well in advance to allow the parties to prepare ahead of 1st January, 2020," said Peter Eckhardt, chairperson of the drafting committee and head of chartering and operations at Reederei F Laeisz.

"The 'Global Marine Fuel Sulphur Clause for Time Charter Parties' will help them do exactly that, as it sets out the obligations and responsibilities of owners and charterers to comply with MARPOL Annex VI sulfur content requirements." Eckhardt added.

The clause states that charterers are obliged to provide fuel that complies with MARPOL requirements, grades and specifications set out in the charterparty, and it is a general compliance clause. It also says that charterers must use suppliers and bunker barge operators who comply with MARPOL and that shipowners will remain responsible for the fuel management.

A second clause discussed at the Copenhagen meeting deals with the transitional period from the end of 2019 to the beginning of 2020. The two clauses will be published as one package.

This clause focuses on co-operation between owners and charterers to minimise quantities of non-compliant fuel on board by 31st December, 2019.

It states that any remaining non-compliant fuel on board after 1st January, 2020 has to be removed no later than re-delivery or 1st March, 2020 – whichever comes first. It also says that removal of non-compliant fuel must be done at the charterers' cost, while tank cleaning must be done at the shipowners cost. TO

Bad bunker stems resurface

There are still periodic cases of bad bunker stems even today.

One of the latest to have a worldwide impact were bunkers taken on at Houston and elsewhere earlier this year.

No clear reason was found for the spate of bunker-fuel related engine failures on ships earlier this year, the International Council on Combustion Engines (CIMAC) said.

CIMAC said no single chemical could be blamed for the engine failures caused by off-specification fuel, an episode which has had a significant impact on bunker markets since the beginning of 2018.

The compound many suspect has caused the damage to more than 100 vessels worldwide this year is 4-cumyl-phenol, a chemical compound typically associated with the manufacture of epoxy resins.

Its adhesive and binding qualities appear to have caused plungers and pumps to stick, leading to engine failure in some cases.

This outbreak of engine failures was not a new one, industry sources said at the recent IBIA Annual Convention 2018 in Copenhagen, as instances occur every two to three years.

Around 100 ships, about 2% to 3% of the bunker deliveries in the Houston area alone, reported problems. These had burnt fuel taken on board during a nine-week period starting in March, CIMAC said. The problems spread to other areas, prompting concern at a number of locations.

The problematic fuels at Houston were supplied by around 10 different companies and from a range of barges, CIMAC said in a letter.

Cargo tank cleaning - a continuing hazard

An explosion off Penang, Malaysia, on board an oil/chemical tanker that killed one and injured five other crew members has been attributed to crew carelessness, manifold piping complexity, and dilatory maintenance, reports Brian Warshaw.

Due to the incompatibility of the two grades of cargoes being shipped, the port side and starboard side common manifolds were used for discharging nitric acid and acrylonitrile, respectively, in order to follow the segregation requirement.

On 17th April, 2016, the Hong Kong registered 12,395 dwt tanker, the 'No.3 Heung-A Pioneer', arrived at Port Kelang and discharged about 6,800 tonnes of nitric acid that had been loaded in six tanks, two on each side of the vessel.

Discharge took place through the port common manifold, with the elbow spools connecting the port tanks to the manifold. The spools remained in place after the cargo had been despatched.

The vessel sailed the same day for Penang, and on the next day unloaded one grade cargo of about 2,000 tonnes of acrylonitrile through the starboard common manifold, with elbow spool pieces used to connect the starboard individual manifolds.

During the unloading operation, the crew discovered that the shut-off valve on the port individual manifold from cargo tank No. 8 was leaking, and they reported it to the Chief Officer.

The tanker sailed in a ballast condition, on route for Singapore. Thirty minutes out, the Chief Officer held a 20 minute cargo oil tank cleaning safety meeting with deck crew.

During the preparation for the tank cleaning operation, an elbow spool piece was wrongly fitted from the port common manifold to the port tank No. 8 individual manifold. As a result, the acrylonitrile residue was able to creep through the leaking manifold shut-off valve of tank No. 8 to mix with the nitric acid residue in the port common manifold.

Around eight minutes after cleaning began, a violent explosion occurred at the port side common manifold at main deck level, injuring six crew members on deck. The tanker returned to Penang and the injured crew members were sent ashore for medical treatment. One of them was certified dead in the hospital on the same day.

Investigation

The investigation[1] , conducted by the Marine Accident Investigation and Shipping Security Policy Branch of the Hong Kong Marine Department, reached the conclusion that the ship management company of the vessel should:-

(a) Inform all Masters, officers and crew of the fleet on the findings of this accident investigation;

(b) Issue safety instructions on handling leaking valves of cargo oil pipelines during operation;

(c) Provide on board familiarisation training to crew of the cargo manifold piping arrangement;

(d) Review the on board procedures for handling incompatible cargoes, taking the following aspects into consideration:

- full risk assessment should be conducted for the tank cleaning operation;
- particular caution should be highlighted when using the common manifold. The 'line-up checklist' should include the use of elbow spool pieces to avoid any violation of the segregation requirement;
- procedures should be developed such as using warning signs, chain lock/seal or barrier on the individual manifolds to prevent them from being wrongly connected to the common manifold which may contain incompatible cargo;
- cargo compatibility information should be readily available to all crew members for reference;
- crew members involved in the cargo tank cleaning operation should attend all relevant safety and tool box meetings.

Tanker owners and operators will also be sent a Hong Kong Merchant Shipping Information Notice to promulgate the lessons learnt from the accident.

[1] Report of investigation into the explosion on board oil/chemical tanker 'No.3 Heung-A Pioneer' off Penang, Malaysia on 18th April, 2016. TO

Tank cleaning guidelines and database

At *Tanker Operator*'s Hamburg conference last October, ChemServe's sales manager Capt Axel Kahl gave an insight to the company's MIRACLE software.

It is essentially a tank cleaning guide and database used by several of the major tanker companies.

The database contains all Annex I and II cargoes. Its tank cleaning advice is based on practical experience of a global network of cleaning experts.

MIRACLE also provides the relevant safety quality and compliance data and claims to be the only tank cleaning guide which has adopted INTERTANKO's tank cleaning standards.

Within the package is an integrated cleaning seminar video, which although made as a reference work, can also be used for office and on board training.

Constantly updated, the database contains all Annex I and II cargo (bulk liquid chemicals and petroleum products allowed to be shipped).

There are over 10.000 cargoes listed, but are easy to find by name and synonym.

For each cargo, the following can be found -

- Physical and chemical properties.
- Tank cleaning recipes for cleaning to next cargo.
- Special recipes for CPP trades.
- Selection of alternative cleaners.
- MSDS data, hazards and prevention measures.
- Exposure limits and measurement tubes for toxic vapour cargoes.
- MARPOL requirements.
- IBC Code requirements.
- Tank coating compatibility.
- US Coast Guard compatibility requirements for adjacent cargoes.
- FOSFA, NIOP, EU and CIQ previous cargo acceptance requirements.
- Stowage data (voyage and discharge temp, heating requirements). TO

Changing seafarers' culture and attitude

Tanker Operator's annual Hamburg conference commenced with a presentation given by Martin Shaw, managing director, Marine Operations and Assurance Management Solutions (MOAMS) who highlighted the change in thinking regarding seafarers.

His conclusion was that the industry needed to focus on human contribution not human error. Are people on board only there to make mistakes, or are they the only thing that makes an imperfect ship and management system work? He asked.

We need to focus less on the potential for error and more on actual value, he stressed. "Decisions made at the front line by informed staff will have an immediate impact."

Shaw listed four distinct eras of handling crew. These were - traditional, procedural, human element and the future.

He said that each era brought evolution but eventually succumbed to the law of diminishing returns, or environmental issues. "We need to finish the job on human element," he said.

Rotterdam-based Clearwater Ship Management has developed what it calls a 'Clearvision' way of motivating and incentivising its seafarers and shore staff.

The company's **Capt Martijn Mobach** said that team spirit is just as important as good material in a human sense.

He said that the company puts the seafarers at the centre of management and aligns them with the shipowner's interests. People are central to the company's DNA, he said.

Competency and attitude are more important than nationality, which was not the case several years ago. For example, he explained that Clearwater has many nationalities on board its ships today and everyone knows each other, so there are no problems.

Quoting Frederic Laloux's book 'Reinventing Organisations', he said that worldwide we are entering into a new Conciousness Shift towards meaning, empowerment and self-management. Previous Conciousness Shifts were - renaissance, collectivism to individualism. Clearwater was following this course with a conscious shift towards self-management, he explained.

Although around 80% of incidents are down to human failure, conversely, 80% of a company's success is down to human effort.

In a seafarer's task, there is enough compliance and technical considerations, which he described as a self-feeding monster and explained that Clearwater attempts to bridge the gap by giving people a sense of awareness, a sense of engagement, inspiration and motivation.

"We need to make compliance workable again," he said. "We need to lighten it up to make it workable. Cutting it back to the bone, we need to insert motivation." Little motivations, such as how a company cares for the environment, could be added.

Appraisals should include feedback, as this is the breakfast of champions, he said. Crew are to be given an assignment planning for a year, so they feel appreciated and their families have a future to steer on.

He said that Clearwater crews are now on the same level by way of being motivated, connected and engaged with the company's philosophy, which happened organically. When talking with the owners, it is a matter of - are we on the same page? Are we engaged on our joint mission?

Quoting Simon Sinek's take on engagement, he said that the best starting point is 'why', rather than 'how' or 'what'. Engagement starts with 'why' - mean it and live it, Capt Mobach said.

Engagement should be by communication and to that end, Clearwater has a dedicated closed Facebook group with company and people news included.

"Everyone is equally important in our mission," he said. "Everyone should be on first name terms. If I call, everyone knows me. And if they like your style, they will stay." He also stressed that those who don't engage in the philosophy should not be held on to, as you cannot match with everybody.

Great teams make great performances. "Make your team great – so engage," he said.

Being a third party shipmanagement company, he claimed that Clearwater was open, transparent and 100% engaged with the owners.

Clearwater works an organisational flatness culture, where everyone is tasked with doing the best they can. Being a smaller company, we are lean, adapt easily and are agile in creating solutions that do not break the bank and serve the target.

Clearwater's Capt Martijn Mobach addresses the audience

Maersk Training's Capt Tonny Moeller

"We hire the best people who will buy into our culture, then just all that energy and commitment is directed towards the shipowner's mission. That is a very rewarding process to be part of," he concluded.

Maersk training

Capt Tonny Moeller of Maersk Training addressed how to combine human and technical factors in training.

Basically, he said that the Maersk Training centres use simulation to create a realistic environment for people to optimise their performance through human factors. In addition, the training helps people understand the need for behavioural change.

"We help people get to where they want to go," he said, also commenting that he believed in assessments.

Tests will show if a person wants to change and needs to change. It helps a person to understand who he or she is and what that person's skills are.

He described 'the forever learning' concept as getting shipping companies committed to better training by adaptive learning and virtual reality.

There were three key elements of trainees assessed -

Knowledge- Does the person have the technical knowledge coming from using instruments, tools, and procedures, which are used during a specific operation?

Skills/Abilitiy (competence)- Does the person have cognitive skills to oversee the information coming from the instruments and the ability to use it in an operational context?

Behaviour attitude - Does the person have the behaviour pattern to follow the correct procedures or can he/she be influenced by stress, fatigue or other issues?

Having done something many times, does a person just do it again? They need to be ready to adjust to circumstances. "They can't just read procedures all of the time," he said.

The training usually starts with a test, an interview with a psychologist and then simulation tests to find a weak point.

Non-technical skills used include situational awareness, team work, leadership, communications, performance shaping factors and decision making skills.

Maersk Training offers a four day bridge team enhancement programme which consists of various tests, both technical and human behavioural factor, where the use of psychometric tools, interviews and self-assessment are used to assess the candidate against a predefined profile.

The team competency profile will be measured against the non-technical skills listed above.

As for the technical assessment, this will be carried out by the use of simulators and theoretical tests, such as knowledge of COLREGS, radar and ECDIS.

A personal development plan will then be drawn up based on extensive feedback taking into account what the trainee would like to learn and improve his or her performance. He or she can take the development plan and regularly refer to it throughout their career.

Refresher training is also held every three years, as there is a danger of people acting exactly as they did before.

Maersk has a 'the forever learning' concept, which is is aimed at getting shipping companies committed to better training by adaptive learning through e-learning and virtual reality.

There are some 200 questions, which can be repeated for example every 12 months. He gave an example of week 1-10 containing 40 questions, while week 11-20 will consist of 40 questions plus three and so on for 50 weeks.

Today around 60% of Maersk Training's operation is with companies outside the AP Moller-Maersk group and different programmes are put together depending on those companies needs.

Moeller said that he didn't see differences in the companies themselves but gave an example of different Masters who will communicate in different ways, and who could benefit from bridge team training.

He said simulator training is a powerful tool, allowing the trainee to physically see what is wrong with his or her performance and become aware of mistakes. "There is a structure around it," he said.

Competence

Daniel Duniec, Head Training & Crew Development at Bremen-based Harren and Partner Group (HP) explained the company's development of a Competence Management System (CMS) and how it directly links to people's performance.

Competence does lead to certification but just as important are a person's skills, attitude, knowledge and experience, as the issuing of a certificate to a seafarer doesn't mean he or she is competent.

It is the ability to do a job efficiently and to a high standard, he said and acknowledged there was a gap between certification and the actual skill shown. There are a lot of questions, which should be addressed, such as are you sure the crew is competent and how do they undertake a particular task?

He found that there was no structure behind monitoring performance. A seafarers career in most cases is based on 'pure chance' rather than a formal plan. With no structure, a seafarer on board learning by doing is usually left without any control.

Gaps will widen if the fast track method of recruitment and promotion is implemented, especially if a company expands its fleet quickly.

As for training, there are many different methods used from shipboard, CBT, in-house and external training establishments. He thought that the most important was 'on-the-job' training.

HP's Daniel Duniec

The CMS concept was first introduced three years ago and is still under development. One of the questions was - how to ensure that partners share the same procedures ashore, enabling a follow up with an individual, plus the use of the shore-based competency system, split into critical and non-critical data. Duniec said that follow up was by far the most essential element. A commitment at all levels was also extremely important.

HP aims to split the manning activities, and the training functions to help ensure a crew member is taken on board only when he or she is ready.

CMS training takes in management and crew performance development, and compliance and statutory issues. The key operational parameters of a correct CMS set up will include seafarers briefings, career reviews, monitoring of low and top performers, setting expectations, follow up feedback, etc.

Essentially, CMS is a crew evaluation system, Duniec explained. The information is contained in a database and updated and if a crew member's entry is green, then he or she is ready for promotion.

By sharing the information, he said the company was moving towards a more open system, away from the more traditional confidential style of assessment used in the past.

As for the manning agents' input, briefings and de-briefings were essential, he said, so these should be included in the database.

CMS goal is to continuously track a seafarer's progress from cadet up to Master with procedures in place for promotions, evaluations, feedback, etc.

TANKEROperator

KEY PLAYERS IN THE TANKER INDUSTRY
will be profiled giving their views on current legislation, recommendations and trends. These will include chief executives from all sectors of the industry from equipment manufacturers to the top shipowners

INFORMATION
about meeting oil major requirements
(TMSA / vetting)

DEVELOPMENTS in management/ safety/ environmental best practice

NEW TECHNOLOGIES
and commercial industry developments

COMMERCIAL TANKER OPERATIONS
including shipbroking, legal matters and financing

IN DEPTH INFORMATION
on the latest newbuilds, sale and purchase, freight rates and derivatives markets, using industry known commentators

A STRONG FOCUS
on shipbuilding and repair

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