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Contents

***Front cover** - FindaportCD: Tanker is the latest addition to the expanding portfolio of Shipping Guides , the industry specialist in publishing port, harbour and terminal information.*

It is an annual subscription service that enables clients to access comprehensive port information from their desktops without having to rely on expensive satellite connections.

The new tanker specific version is tailored to the day-to-day tanker information requirements of oil majors. Access is given to specific port information - including mooring diagrams, berthing facilities and cargo handling capabilities.

Owners and operators look set for a prosperous new year

Yet despite the optimism, next year will be even more costly for owners and operators.

Not only do we have the ECAs to deal with but also ballast water treatment systems to think about, if not already done so, plus all the other requirements the regulators throw at us.

Then there will be the general increase in operating costs, which is as inevitable as 'death and taxes', quoting Benjamin Franklin.

One of the main benchmarks on a vessel's daily operating costs is provided annually by Moore Stephens' OpCost survey. This takes into account 12 cost categories and encompasses more than 3,100 vessels of all types, of which tankers make up around 33%.

The one factor that is not taken into account is finance, as this will vary from vessel to vessel, but it proved to be the major factor, which will most influence owner/operator respondents decisions going forward, according to the survey results.

The weighted average of tanker daily opex rose by 1.1% in the latest survey of 2013 costs released towards the end of October this year. Crew costs, mainly wages, went up by the largest percentage of 1.8%, followed by repairs & maintenance, which showed a 1.6% increase. Conversely, stores dropped by 2.1% and insurance by 0.6%.

Next year, Moore Stephens predicted that the various cost factors analysed will continue to rise, so the race to find the most cost effective Eco-tanker will no doubt continue. Indeed, *Tanker Operator* is continuing its series of conferences on this very subject through 2015.

It must be stressed that these are very basic costs and other expenses will have to be factored in on a vessel by vessel basis, but it does provide a good benchmark - after all you have to start somewhere!

Nordic American Tanker's Herbjorn Hansson has claimed that he can run his Suezmax fleet for around $12,000 per day per ship on average, taking everything into consideration.

Slight optimism

While opex proved to be a problem for most owners/operators last year, 2014 has thus far given the sector slight optimism that the worst days are over. Although recent rate levels in most segments have been volatile, the average taken through the third quarter of this year and into the fourth have shown that earnings have been roughly double the daily opex.

With ordering virtually at a standstill and newbuilding deliveries going forward not as bad as first feared, that oft used phrase- cautious optimism- remains. Unfortunately, this issue had to be produced before the results of the 27th November OPEC meeting were known, which could affect the crude trades.

However, there is no stopping the rhetoric coming out about how US exports and world refinery shifts will help the clean tanker market by increasing tonne/miles and allowing more voyage triangulation, thus reducing ballast legs.

There are new sources of cargoes being forecast for both the crude and clean trades, in addition to the more traditional benchmark trades.

Bubbling underneath is the increased interest being seen in coated Panamaxes and Aframaxes, especially for naphtha cargoes to the East. Again this helps to take tonnage out of the market, as the vessels are not competing for crude cargoes.

Obviously, the current (mid-end November) falling bunker prices help operators, owners, as well as charterers. But will the decline in Brent levels impact on future oil exploration and production?

Most pundits think the low levels will last through 2015, but political events might play their part, as unrest in certain oil producing countries looks likely to continue, as does the Russian situation over the Ukraine.

At the time of writing, we are approaching the Northern Hemisphere winter season and we have already seen severe weather hitting upper New York State. The last thing a tanker owner/operator wants is a mild winter, which normally results in reduced demand for heating oil, thus impacting on refinery runs.

One thing that we can forecast with a reasonable amount of certainty is the continuation of consolidation in all segments of the industry.

Daily Operating costs 2013

Tanker type	Daily rate ($)	Year on year change (%)
MR product	8,016	+0.3
Handysize product	7,964	+2.8
Panamax	8,482	+0.3
Aframax	8,272	+1.2
Suezmax	9,378	+1.3
VLCC	10,194	-1.5

Source: Moore Stephens OpCost 2014.

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The year to end on a high?

Charterers demand for VLCCs, ex Middle East Gulf, had eased off by the middle of November but clean tankers boomed.

This came after VLCCs had basked in the glory of a good run, with average spot earnings on the benchmark trade from the Middle East to Japan, reaching $24,500/day (mid-November), the highest level since 2010, leading broking house Gibson said.

A number of factors supported stronger VLCC returns. For example, Middle East OPEC crude production had averaged record levels since the beginning of the year. At the same time, there have been gains in the long haul trades from South America/Caribbean and West Africa to the East.

Despite charterers resistance, owners were bullish for the remainder of 2014, as rates tended to firm in the run up to the holiday period on the back of typical winter related delays/disruptions and the market 'psychology' to fix ahead of the festive period.

New VLCC deliveries are forecast to reach the lowest level since 2006, with just 20 vessels scheduled to enter service giving owners more cause for optimism, Gibson said.

A lot will also depend on whether OPEC decides to maintain, or to cut its crude production at the next meeting. Unfortunately, this article had to be written before the 27th November meetings results were known.

After seeing the clean spot markets firm across the board during the past few weeks, the East lost some momentum towards the mid-end of November, reported Fearnleys, while the West remained firm.

Despite a more mixed sentiment in the spot market, clean tanker owners were still chasing firm numbers for timecharter business.

In the fourth quarter of this year, thus far MRs in the West performed much better with TC2 and TC14 triangulation earnings averaging $16,750 per day in October and $24,500 per day in November (to 21st November).

While falling bunker prices have helped earnings, the prime reason for the rates firming was increasing demand and tighter tonnage lists, Gibson said.

In early November, Venezuela suffered refinery disruptions resulting in increased gasoline and diesel imports from the US and Europe, adding to firm requirements from elsewhere in Latin America.

In October, an arbitrage window for gasoline to the US helped support rates transatlantic.

However, in the clean tanker sector, MRs face the greatest risk of oversupply. By the third week of November, 74 MRs had been delivered with 14 more to come before the end of the year, Gibson said.

While a higher level of scrapping is expected next year, deliveries will remain high into 2015 and 2016 putting downward pressure on earnings potential.

With pressure on European refineries increasing, the signs point to increased imports from the Middle East/India, US and the FSU bloc to Europe. Although trades from the East will favour larger clean tankers, the longer tonne/miles should benefit the MR market as well.

Further ahead, the potential restart of the US Virgin Islands Hovensa refinery with a planned 300,000 barrels per day capacity, could further change product tanker trades dynamics in the Atlantic basin, Gibson said.

China and India will account for about 35% of global oil trade in the next 10-15 years, despite China's commitment to increasing the use of clean power and renewable energy.

Speaking at a recent conference, Harald Lone, chairman and CEO of Newport Shipping Group, said that with imports of crude oil to the US in decline, as the country develops its shale oil and gas reserves, China and India will become "very important" to the crude oil markets.

"There is no doubt that shale oil and gas is changing the oil industry and it will have a major impact on trade flows,"he said.

Commenting on the impact of sulphur emissions legislation on the tanker segment, Lone said: "One major issue that is coming up is the implementation of the ECA [emissions control area] rules in January but very few shipowners are looking at the issue. Maybe, as an industry, we have been hiding our heads in the sand for the past year hoping the issue will go away, but it hasn't."

Anticipating a tough year ahead, Lone warned that there must be more collaboration and co-operation between shipowners. "We have to consolidate. We can't continue to operate in a low freight [rate] environment. My hope is that shipowners will continue to keep their vessels in ship pools and not just in a bear market."

In October, Newport Shipping Group announced a more flexible pooling concept for Handysize drybulk carriers based on a performance-related fee structure. While the revenue sharing agreement is initially geared to the bulk carrier segment, it is likely that the concept will be soon rolled out to the small product tanker segment.

US crude oil exports

Shortly after the US Energy Information Administration (EIA) released a report at the beginning of November on what drives US gasoline prices, the American Petroleum Institute (API) said that its findings were a significant argument in favour of dropping all restrictions on US crude oil exports.

The EIA report "confirms that lifting trade restrictions on U.S. crude oil could benefit US consumers and promote America's economic growth," the oil and gas industry's trade association said in a statement, reported Platts.

The Producers for American Crude Oil Exports (PACE), a lobbying group backed by independent oil companies, including Anadarko Petroleum, ConocoPhillips and Hess, also said the EIA report backed the group's calls for liberalising the crude export restrictions, which have been in place for nearly 40 years.

" (This) report is further evidence that the ban on US crude oil exports is outdated and should be lifted, because doing so will provide enormous benefits to American consumers and workers," said PACE executive director George Baker in a statement.

It seemed that US lawmakers were hesitant to support any change in crude policy, which may be interpreted as impacting gasoline prices, Platts said.

Although it may take a decade, or so for the US to change its stance on US crude exports, the calls appear to be getting louder, which, if heeded, can only help the tanker market in 2020 and beyond.

Anchorage slot numbers increased

The Gibraltar Port Authority (GPA) has embarked upon a number of measures to consolidate its third place in Europe's bunker league table, behind Rotterdam and Antwerp and its first place in the bunker supply table of Mediterranean ports.

Apart from bunker supply, Gibraltar is well known as a maritime service base where the many different companies located on the 'Rock' will join together to promote the area to the world's shipping community.

One enhancement was the increasing of the number of designated anchorage slots in Gibraltar's Western Anchorage by the freeing up of two slots, bringing the total number up to 14, an increase of over 20%.

The two extra slots became available due to the moving of 'mother' product tankers, which stored bunker fuel. The fuel was imported on product tankers using ship-to-ship (STS) transfer operations and then transhipped to the fleet of bunker tankers/barges to fuel the vessels while at the anchorage.

One large storage tanker remains - Vemaoil's Aframax *Vemaspirit, ex Eagle Charlotte* - which is currently lying alongside the detached mole. There are long term plans to develop the mole into a bunker storage facility with more permanent infrastructure. The Gibraltar Government is also considering proposals for land-based storage, but no decision has been made thus far.

Two oil storage concerns have land-based facilities across the Bay at Algeciras, but these facilities were thought to relate to long term storage, rather than for the supply of bunker fuel. Tanker berths have also been constructed connected to the storage facilities by pipeline.

Last May, the GPA abolished the regulation which limited each bunker supplier to four barges/tankers in operation at the slots at any one time. Today, there is no limit as to the number of bunker barges that can operate in the Western Anchorage simultaneously thereby minimising inefficiencies and delays considerably.

These vessels can supply high sulphur fuel oil, low sulphur fuel oil and marine gas oil. The fuel suppliers have to adhere to a strict bunkering code of practice, emulated in other ports and two bunker superintendents are fully employed in the Western Anchorage. The GPA is also an associate member of Oil Spill Response Ltd (OSRL) and has invested in its own oil spill equipment and plans to install oil spill radar equipment shortly.

A couple of the outer slots have been earmarked for large STS transfer operations, which are also controlled by the GPA, but operated by specialist companies, such as SPT. Strict conditions apply, for example, the approaching vessels must manoeuvre in daylight, inspections prior to commencement of operations and the booming of vessels involved in black oil transfers.

Commodore Bob Sanguinetti.

The recently appointed GPA CEO and Captain of the Port - Commodore Bob Sanguinetti -told *Tanker Operator* that the previous problem with congestion at the Western Anchorage bunker slots had all but disappeared, apart from when the area is affected by severe weather and overall, the numbers of vessel calls have remained stable.

As an example, in 2012 (the latest figures available) out of 9,581 calls made in Gibraltar waters, either in the Bay, or in the port, 6,362 were for bunkers, 127 came in for repairs, while other calls involved cruise vessels and those discharging, or loading cargo at the port.

The VLCC *Maran Carina* receives a top up in the Western Anchorage.

Gibraltar's VTS operations room is to move to larger premises.

Some 1,259 vessels called off-limits for various services.

Vessels using the slots are normally bulk carriers and tankers, but all types and size of vessels can be accommodated in the deep but sheltered anchorage, with containerships generally bunkering at their ports of loading/unloading, such as Algeciras and Tangier.

Incentives offered

Various incentives are on offer to vessel owners/operators using the slots, including a 75% discount of bunkers only calls. Last year, Gibraltar joined the growing ranks of ports signing up to the Green Award scheme, which offers service discounts for vessels carrying a Green Award Certificate. In the case of Gibraltar, this took the form of a 5% discount on tonnage dues, which came into force on 1st April, 2013.

Other services recently introduced include a web-based vessel management system, the aim of which is to link all the stakeholders involved in a vessel call. This gives a much more fluid information flow, Commodore Sanguinetti explained, leading to smoother running and safer operations in and around the Bay. In addition, the Vessel Traffic System (VTS) control centre will soon be moved to a more prominent position at the southern end of the 'Rock' at Windy Hill, overlooking the straits and the entrance to the Bay. In addition, the number of VTS operators has recently been increased to 10.

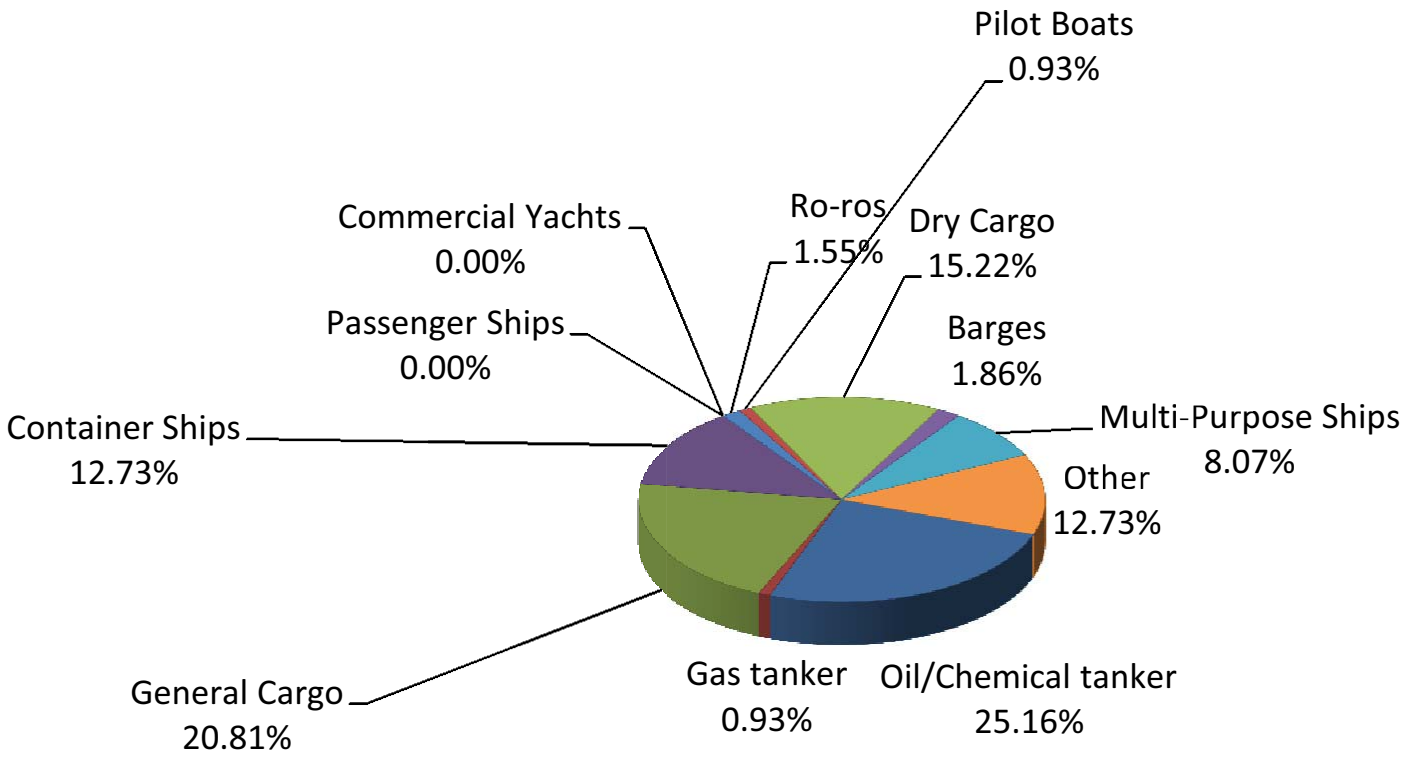
As for the Eastern Anchorage, bunker operations are not permitted in this area, due to the prevailing weather conditions and Mediterranean swells, plus it is designated as an environmentally sensitive area. Also this anchorage is further away from support, should it be needed.

However, other marine services are carried out in the anchorage where a recently introduced 75% discount applies to vessels remaining for up to 48 hours. Commodore Sanguinetti said that there had been dramatic increase seen in the level of activity on the eastern side of the 'Rock' with occupancy rates above 80%.

To promote the services on offer at Gibraltar, the GPA, together with the government, has embarked upon an aggressive marketing campaign. At the time of writing, (mid-October) a trade mission was being planned to Hong Kong in late November.

Commodore Sanguinetti described the broad range of shipping services available from the 'Rock' as a "one-stop-shop" approach. "Everyone (in the shipping business) works very closely together," he explained. "Gibraltar has the infrastructure, office space, international connections through the airport to support shipping related companies wishing to set up shop on the 'Rock'. We have a mixture of local and multi-national companies offering shipping services."

One of the many services offered is crew change. By being outside the European Shengen area, Asian and other seafarers can be fast tracked through Gibraltar via London. Underwater hull and propeller cleaning takes place at the western anchorage and the port also boasts a



Gibraltar Fleet Data - Ship Types. **Source: Gibraltar Maritime Administration.**

modern cruise terminal and a Panamax capacity shiprepair yard-Gibdock- the former UK Royal Navy repair facility.

Flag state

Another major activity on the 'Rock' is vessel registration. In 1997, the Gibraltar Maritime Administration was established in its present format as a registry of ships.

Since then, the registry has obtained 'White List' status under the Paris MOU on Port State Control. It is an EU member states' register, entitling it to EU cabotage, among other privileges.

The registry has seen steady growth during the past 10 years or so, illustrated by the 2013 total of 332 vessels entered of 3.38 mill gt, compared with 170 of 1.04 mill gt entered in 2003. Oil and chemical tankers account for the largest percentage at more than 25% of the latest total of vessels, followed by general cargo vessels with 20%.

Services abound

Gibdock continues to handle a variety of vessels at its repair yard, including tankers.

For example, earlier this year, Piraeus-based Aegean Maritime Petroleum Network (AMPNI) contracted Gibdock to carry out repairs to three of its bunker vessels.

The *Aegean Princess*, *Halki* and *Nisyrus* were all docked within the space of just over a month.

The 1991-built, 7,030 dwt *Aegean Princess* was drydocked on 10th June this year for a 10-day repair project. The most critical element of the repair work was a full overhaul and repairs to the vessel's aft mooring winch. In addition, Gibdock carried out work to the sea valves, engine coolers and anchor cable and carried out a full hull cleaning and paint job.

The sisterships - *Halki* and *Nisyrus* - 6,270 dwt double hull bunker tankers built in 2011 and 2010, respectively, were both docked in July. Halki was drydocked to repair damage to its

bulbous bow and for hull washing, while Gibdock removed a damaged main engine block on *Nisyrus* and replaced it with a new one.

Simultaneously, *Nisyrus* sea valves were overhauled, the anchor cable refurbished and shipboard cranes tested. Finally, the vessel received a full hull blasting, washing and paint job. All three of the vessels operate bunkering vessels in the Bay of Gibraltar.

Andreas Papapostolou, fleet manager for the AMPNI division, Aegean Bunkering Services, said at the time: "It was logical to select Gibdock for the work given its proximity to our business. There were cheaper options available, but we know Gibdock deliver on time and carry out work to the proper standard."

All three projects went smoothly and Papapostolou praised the constructive approach of the Gibdock management team. "Of course there were moments of tension during the course of each project, but they were all quickly resolved thanks to the good working relationship we have developed," he said. "We are happy with the end result and that is why we go back to Gibdock."

AMPNI has a fleet of around 65 vessels, eight of which operate in and around Gibraltar.

Nearly three years ago, Wilhelmsen Ships Service (WSS) set up the Strait Solution, whereby vessels calling at Algeciras, Gibraltar and Ceuta are charged just one agency fee.

According to Nicholai Bado, Strait of Gibraltar (SOG) Ships Agency Service Manager, WSS, "The Strait Solution is now been used by more customers as they see the benefit to the single point of contact within the area. The idea of moving within these three very active ports with no further appointments, or delays is an advantage. Customers now want quick turnaround on their vessels and 'Your Strait Solution' is the answer."

In 2012, one dedicated team co-ordinated WSS services within the three SOG ports of Algeciras, Ceuta and Gibraltar. For example, a vessel needing to take on bunkers at Gibraltar and liferaft exchange services at Algeciras will pay just one agency fee, thus streamlining

Aegean's *Halki* seen bunkering a bulk carrier.

operations.

WSS operates a liferaft exchange (LRE) service in the area and has a warehouse in Algeciras where the liferafts are housed. Bado explained that the LRE service covers all ports around the SOG and not just Algeciras.

"In our region, the liferaft exchange service covers Algeciras and Gibraltar and since its launch, we have carried out a large number of exchanges. Typically, ships will do their exchange off-port limit (OPL) Algeciras and Gibraltar when transiting the Strait, " he explained.

He also said that port calls within the SOG area have seen a healthy trend on a year on year basis. One advantage is that low sulphur fuel oil is being offered on both sides of the Bay by all the suppliers, which gives an extra value to the area. Both sides of the Bay have LSFO storage facilities. Bado also stressed that bunker operations had not been affected by the removal of the 'mother' ships from the Bay.

As for crew exchange, there has been no change to ease of which crew can be transited through Gibraltar, or Malaga airports to and from vessels calling in the Bay. However, he said that WSS was waiting for new air routes to be introduced.

He praised the GPA for introducing the new service to revive the Eastern Anchorage. "This opens new doors for customers to carry out husbandry service at a safe anchorage," he said. "It also gives the availability to act as a holding area and at the same time, ship operators can carry out any other services, which may be required."

An example of other services available in the area is electronics installation and servicing by companies such as Aage Hempel and the Sandvik Marine Group, among others.

Sandvik's local area manager John King told *Tanker Operator* that the company had been "flat out" with ECDIS installations, mainly MARIS, which was recently sold to Navico Holding and will become part of the Simrad brand.

In addition, the company carries out radar, VDR, GMDSS, satcoms, gyro and autopilot installations worldwide.

King also said that Sandvik had more than 120 vessels signed up to the company's shore-based maintenance scheme.

Today, Sandvik has offices in Spain, Gibraltar and Singapore.

Another electronics service concern active in the area is Aage Hempel.

This company recently extended its existing relationship with Pole Star by signing a global distribution agreement. As a result, the company will offer Pole Star's portfolio of products and services, including Fleet Management, Alert Advanced Ship Security Alert System (SSAS), Marine Asset Tracker (MAT), and LRIT conformance testing services.

Aage Hempel Netherlands was the first branch to start offering Pole Star services, with Spain, Gibraltar and Morocco soon to follow, plus other shipping centres..

"We are extremely pleased to extend our relationship with Aage Hempel," commented Duncan Halliday, head of commercial marine sales at Pole Star at the time of the announcement. "Aage Hempel is a well-established company within the maritime market specialising in the service, sales, and installation of a variety of maritime equipment including navigation, communication and safety equipment. They're also a provider of satcom solutions and there is an excellent synergy between our organisations."

Aage Hempel was founded in Denmark in 1933. In 1992, Aage Hempel Spain was opened with a small office in Algeciras. In 2008, it was sold to the present owners - Arbulu Group - a company also involved in the marine electronics industry.

TO

IBIA addresses quality/quantity issues

The International Bunker Industry Association (IBIA) has called on the world's ports to sign up to a port charter scheme to improve bunkering standards.

Signatories to the IBIA Port Charter will be required to demonstrate that they have a licensing scheme for bunker suppliers in their port; that they are able to regulate and enforce their regulations covering bunkering operations; that there are sufficient qualified personnel working in the bunker supply chain and that they have effective testing regimes in place.

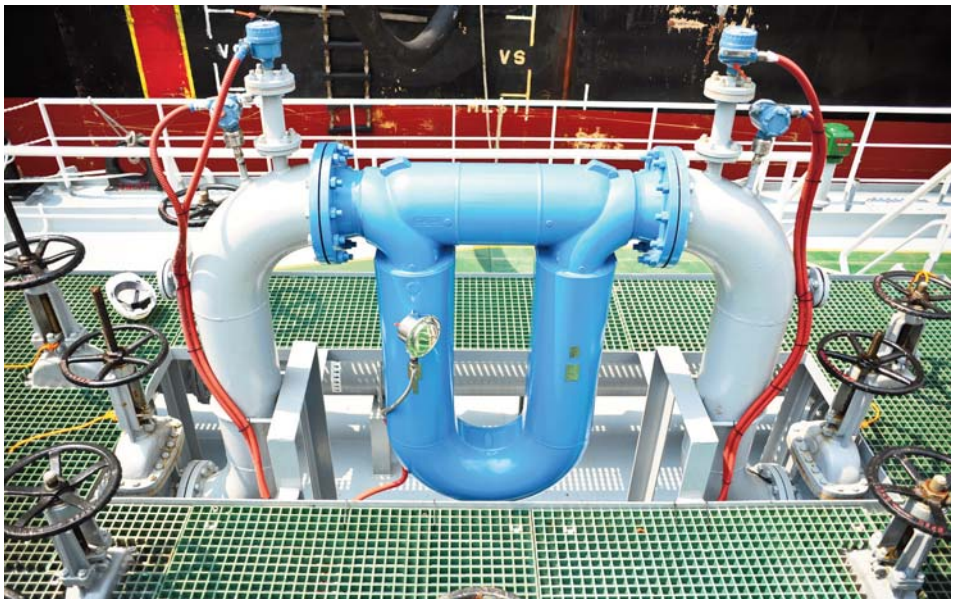
IBIA Chairman Jens Maul Jorgensen said:"IBIA believes that partnerships with ports to deliver 'quality, quantity and transparency' are a key element in delivering a robust fuel supply chain. As changes occur going forward with new fuels and variants designed to meet compliance, we need now more than ever to be vigilant in ensuring quality is maintained. It would be a great day for maritime commerce and the bunker industry if the perception that the quality of bunkers was habitually 'poor', or 'bad' was consigned to history."

The IBIA Port Charter already has the support of the ports of Rotterdam, Gibraltar and Singapore.

The quality of bunkers delivered to ships is under increasing scrutiny. In October, the IMO's MEPC 67 agreed to establish a correspondence group to develop draft guidance for assuring the quality of fuel oil delivered for use on board ships and to consider the adequacy of the current legal framework in MARPOL Annex VI for assuring the quality of bunkers.

This compromise solution was welcomed by IBIA. Submissions by the association addressing sulphur compliance issues and quality control had called for a series of practical measures including a licensing scheme and for the Bunker Delivery Note (BDN) to be a more useful document containing information on the specification of fuel ordered.

IBIA CEO Peter Hall said:"This has been a step forward by IMO. Previous MEPC meetings would not entertain a correspondence group, but taken together with a commitment to improve MARPOL regulations, we believe that the measures will improve the situation.



The MPA is mandating the use of mass flow meters. Photo credit - ExxonMobil Marine Fuels

"The ultimate safety risk to vessels using fuel 'not fit for purpose' is simply unacceptable in this modern day. Any improvements that can be made to the fuel supply chain are welcomed. And it is ultimately down to bunker suppliers to provide compliant fuels.

"However, buyers have a responsibility to specify the quality they require and be willing to pay for it. We believe that the authorities must provide sanctions on continuously under performing suppliers. Without this, the current disquiet in the industry will continue," he said.

Flow meters

In another move, the Maritime & Port Authorityof Singapore (MPA) has accredited IBIA's new Mass Flow Meter training course. The course provides in-depth information about mass flow meters; how to install and use them and looks at legislative, calibration and accuracy issues.

In April of this year, the MPA was the world's first port authority to introduce mandatory mass flow meter system for its bunker suppliers.

Hall said:"This is the latest in our range of professional training courses for the bunkering industry. Ultimately, the use of mass flow meter will result in a smoother bunker transaction landscape with less commercial disputes, shorter delivery times and a simpler custody transfer process."

In a separate move, at IBIAs recent Hamburg convention, Jorgensen saw his one year term as chairman extended by a further year. Hall said:"As a prominent shipowning representative, Jens has been instrumental on focusing IBIA's efforts on improving bunker quality around the world. He is an extremely energetic and dedicated chairman and I am delighted that he will continue to support our drive to raise standards across the industry." TO

Keeping track of bunker transactions and compliance

Cloud software concern Inatech has launched ECA Compliance, a rules based application and reporting tool.

It has been designed to give vessel operators the information and reports needed to show continuous compliance with the forthcoming 2015 ECA regulations.

ECA Compliance, part of Shiptech, Inatech's cloud-based fuel management product suite, allows ship operators to constantly record, track and report on their compliance with ECAs. The application also gives an alert, enabling operators to change fuel when the ship enters, or leaves, an ECA.

The change in regulations will impact price, fuel procurement and fuel quality, Inatech said. The increase in demand for low sulphur fuel can affect the price while the lack of availability of the fuel will force vessel operators to rethink fuel procurement.

This volatility is likely to lead to an increase in low-quality fuel such as off-spec fuel, or fuel pumped with air to increase the volume, known as the 'cappuccino effect'.

Shiptech claimed to be able to address these issues by streamlining fuel procurement, avoiding last minute purchases and supporting negotiations.

Inatech's head of sales, marine, Alok

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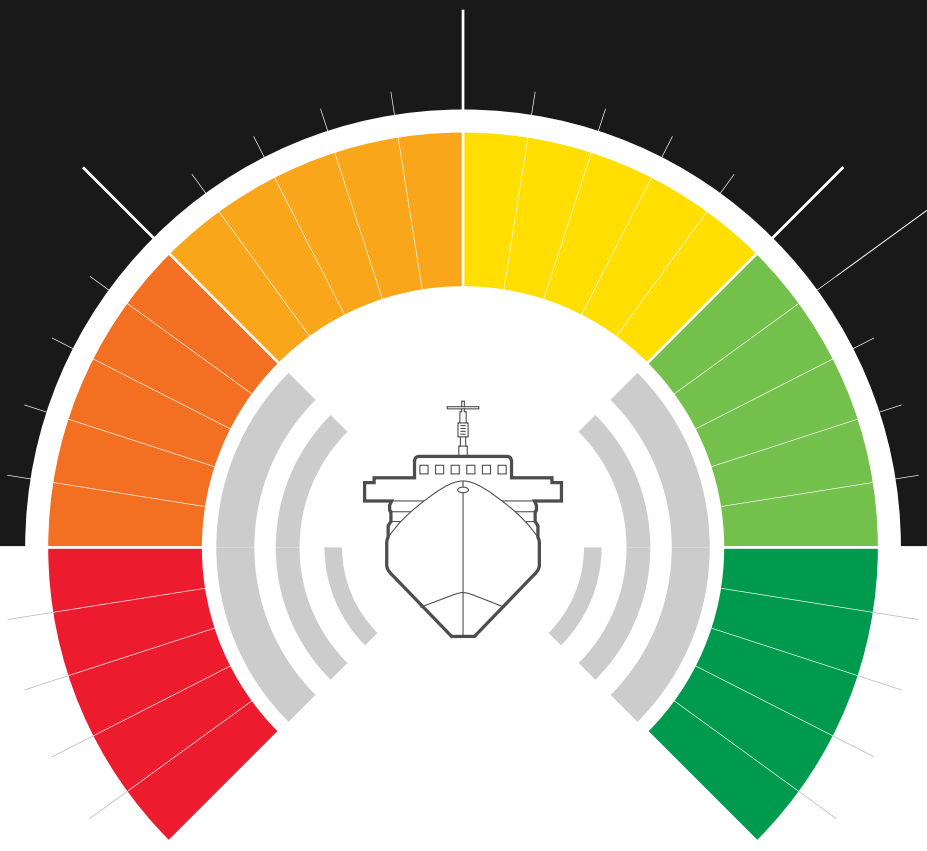

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Sharma told *Tanker Operator* that the question of quantity arises in Singapore and quality in Rotterdam, the latter primarily due to the import of Russian crude.

ECA Compliance records detailed information about fuel procurement allowing the compliance application to produce reports to any level of detail that is required.

Basically, the fuel management system is split into two separate parts - one for bunker consumers and the other for suppliers.

Most of the suppliers are working to thin profit margins and when bunker costs escalate, the margins become even thinner, Sharma told *Tanker Operator*.

The software takes in the three cycles of bunker operations:

- Pre-purchase cycle.
- Undertaking the purchase - quantity and quality issues.
- Post purchase- claims, etc.

The software will give the latest prices from *Bunkerworld* and other sources, plus a complete KPI listing whereby the company's own suppliers can be rated.

When deciding on spot, or contract, arbitrage is important and so the software ensures that the information is channelled in the correct way.

It has been estimated that only about 10% of the time is taken up in vetting the suppliers when considering a purchase, as bunker suppliers have never been viewed as business partners, with an operator's bunker department calling the shots, Sharma said. There should be more pressure put on the bunkering superintendent to deliver the transparency that the buying companies need, he added.

Sharma also thought that the new Singapore regulations concerning mass flow meters was a step in the right direction. "Better enforcement of the rules will get rid of fraud. The bunker sector needs stricter rules and penalties invoked,"he said.

ECA Compliance can be purchased as a standalone software, or as part of the Shiptech package. He described the ECA software as a logical extension to the fuel management software.

The software can deliver three advantages for those operators needing to trade in an ECA zone. These are -

Vessel tracking - vessels approaching ECA boundaries can be highlighted according to company policy to see if they are compliant.

Alerting- when approaching an ECA zone, fuel can be switched well before entering the area by alerting the vessels and management. Individual ships can be identified, or the whole fleet as can trade lanes to see if the vessel is compliant. The operator can then be confident that the rules are being followed.

Control - not burning expensive low sulphur fuel oil outside an ECA.

Shiptech will take a vessel's schedule from its voyage management system, as inventory management software is built into the solution. By using this system, the correct amount of fuel can be kept on board.

By using the cloud technology, a company does not need hardware, IT, etc, just a browser and a plug. Software installation takes around two days on vessels fitted with FleetBroadband and it is automatically updated. TO

Shipping industry challenges

According to Inatech, fuel costs remain a big issue for shipping but nowadays operators also need to deal with:

- Regulations and compliance.
- Issues with marine fuel quality and quantity supplied.
- Claims management.
- Oil price volatility.
- Credit management.

Shiptech is a cloud-based and on-premise bunkering solution, providing real-time analysis;

- Real-time analysis of data improving decision making.
- Real-time guidance on the three key factors of quantity,location and price strategy.
- Real-time market and risk exposure information.

Flexible

- Scalable and integrated to grow with the business.
- Modular and flexible to support existing and future business needs.
- Fully automates all the key processes in bunker procurement, driving operational efficiencies.
- Effectively manage bunker quality/quantity issues.
- Ensure compliance through supplier rating/monitoring.
- Automate and manage claims easily.

Cost effective

- Improves operational efficiency to bring down costs and increase profitability.
- Quick to implement.
- Full co-existence with existing systems.

Key Features

- Bunker Delivery Receipt (Note), which ensures the right quality and quantity information.
- End to end procurement management.
- Claims management.
- Advance analytics and reporting.
- Trade and risk management.
- Optimiser - real-time guidance on the three key factors of quantity, location and price strategy.
- Planning - checks and balances within the system alerting the users to take timely action.

OW Bunker repercussions felt worldwide

The fallout from the bankruptcy of the world's largest fuel supplier, OW Bunker, was still being felt as Tanker Operator went to press (mid-November).

Immediately after the event, which was announced on 7th November, there were fears of possible supply shortages, unpaid bills, bunker tanker arrests and so on.

Although there has been a sharp drop in energy prices since June, OW Bunker blamed losses of more than $125 mill sustained by its Singapore-based subsidiary Dynamic Oil Trading, due to an alleged fraud, which pushed the group's losses to $750 mill, prompting the banks to withdraw their support.

OW Bunker had expanded rapidly in recent years and listed on Nasdaq Copenhagen. TO

Simulator training market still buoyant

***Tanker Operator* asked Transas about the current training simulator market and in particular were academies concentrating more on upgrades, or whether there was still a market for new equipment.**

The company said that with the development of technology, training requirements evolve as well. "If you look at the history of simulator-based training, you will see two tendencies - following the mandatory regulations and the need to meet the industry requirements."

An example of the regulation-driven change is the situation with ECDIS training, while growing demand in the tug, offshore and DP simulators illustrate that the industry understands the benefits of simulation and is willing to invest in it.

There is still much work needed to equip all training institutions with modern training tools meeting the industry demands. In the coming years, training will be the focus for the shipping industry, taking into consideration the increasing requirements for the qualification of the seagoing personnel due to a shortfall of seafarers, Transas said.

The company has found that there is a balance between a demand to provide bridge management courses using full mission bridge simulators and specific training. This depends on the training goal.

For example, recent simulator training at the Lithuanian Maritime Academy was intended for personnel going on board the floating storage and regasification unit *Independence* in Klaipeda. These exercises involved simultaneous training of the FSRUs crew, tug masters and VTS operators. For this specific task, the simulator configuration included six full mission bridges.

In addition, many schools choose classroom configurations along with full mission bridges to meet the demand for ECDIS training as per the STCW Manila amendments.

Many training providers see simulation as an effective training tool and invest in it. Only simulation can provide a tool for emergency response training in a risk-free environment, Transas said.

For example, recently Transas unveiled its ship-to-ship transfer functionality incorporated in the liquid cargo handling simulator LCHS 5000 TechSim LNG. Ship-to-ship transfer is a complex operation, which requires adequate training to minimise the risks of damage to personnel, environment and assets. This functionality enables a complete resource management training involving crews of both mother and daughter vessels.

In the cloud

Addressing software in the cloud issue, the company said: "We see a promising future for the cloud simulators. Both training providers and students will benefit from this technology. It provides increased flexibility in simulation access, inside, or outside, a fixed simulator location, on a variety of Internet devices, using a standard browser, without the need for installation of specific Transas software on the client device.

"The cloud simulation doesn't replace deployed simulators, it simply provides an extension of them for existing Transas customers. It can potentially provide cost benefits by reducing IT infrastructure, support, space, simulator and other investments. Also, it provides a means to reduce the time to deploy new training simulator platforms, or deploy simulators temporarily for limited volume courses," the company said.

The first 'live' cloud simulation roll out will occur in early 2015 with the State University of New York Maritime College (SUNY) for engineering and liquid cargo handling training applications.

It was announced in October that Navsim Services and Transas Americas Team, were awarded contracts for the supply of a combination of full mission, classroom and cloud based Transas Technical simulation (TechSim) solutions for SUNY.

The full mission and classroom systems are being fitted to meet forthcoming new United States Coast Guard (USCG) National Maritime Center (NMC) training requirements. They will include multiple models from the Transas library with the latest functional capabilities of the Transas TechSim platform.

Transas has also recently supplied training equipment to the Wallem Maritime Training Centre in Odessa, Ukraine.

Three training simulators will be installed - bridge simulator (Transas NT-PRO 5000 5.25), engine room simulator (Transas Techsim 5000 8.3) and liquid cargo handling simulator (Transas LCHS 5000). They will be used to simultaneously train deck and engine officers in handling all types of vessels including tankers.

Wallem's fleet personnel director, Fared Khan, explained the simulators are one of the primary means of delivering courses required by the IMO. "Nothing is better than hands on training when evaluating capability for making ships safer for everyone on board."

"The state-of-the-art Transas simulators will assist us to not only refine the officers' skills leading to operational excellence on board, but also to train our sea staff in how best to respond to different non-routine, challenging and critical situations at sea and in port. Integrating previous incidents and lessons learnt will ensure the same mistakes are never repeated in the fleet," Capt Khan said.

Wallem Europe crew manager Wiebke Schuett said, "The Wallem Ship Management's Masters, officers and engineers will benefit from the simulators, receiving training prior to joining their next vessel.

"The Wallem Maritime Training Centre in Odessa trains not only Ukrainian officers, but also officers from other Eastern European countries, including Russia, Romania, Serbia and Croatia. We currently have about 250 officers from the region on board Wallem-managed vessels and a pool of 700 officers," she said.

The training centre in Odessa currently offers 18 courses for Wallem seafarers. Wallem Ship Management has eight training centres located in the group's key seafarer recruitment centres in the Philippines, India, China and Eastern Europe.

Commercial software provider's in-house team training

With a substantial client base in tanker trades (eg, oil and chemical shipping), Veson Nautical has worked upon identifying a product that would help its workforce development in this specialised market.

After research and a review of available training and development options, Veson Nautical selected 'Introduction to Oil Shipping', a web-based course created by The Oxford Princeton Programme, a provider of commercial education and training solutions to the energy industry.

Initially offered as training during the on boarding process, 'Introduction to Oil Shipping' also proved to be a helpful refresher tool for the more experienced employees who were not as familiar with that sector.

'Introduction to Oil Shipping' contains diverse and to the point materials that range from the basic terms used to describe a ship to comprehensive explanations of the vessel chartering process, shipping charter contracts and freight cost calculations.

"Our company's success is rooted in our employee's ability to understand and address the challenges and opportunities of our clients and the shipping industry at large," said Barry Hartunian, Veson Nautical's vice president, Human Resources. "'Introduction to Oil Shipping' provides up-to-date information on maritime compliance and regulations and gives Veson Nautical employees foundational knowledge to build ongoing relationships within the shipping community."

The flexibility of the web-based course complements Veson's blended learning philosophy, which also includes mentoring, as well as a variety of in-house training programmes. With close to 100 employees spread across three global offices, web-based

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Comprehensive testing and
advice for condition monitoring

Sail Safe

ACCREDITED LABORATORY
SAC-SINGLAS
Cert No: IB-2010-022-C

bizSAFE 3

ACCREDITED INSPECTION BODY
SAC
Cert No: IB-2010-020-C

training helps the company provide convenient and uniform training around the world to ensure the skill and knowledge development of its growing team, it said.

Veson has been providing commercial management and trading tools since 1979, which today consists of software development. The company has more than 200 clients.

Efforts to employ nautical-experienced consultants are balanced by the company's willingness to step outside the maritime industry to recruit a talented technology team to support the robust software platforms, hence the search for a solution that would provide its employees with fundamental industry-specific knowledge and training during the critical on boarding process, the company explained.

TO

Kongsberg introduces new bridge simulator

Kongsberg Maritime has unveiled a new ship's bridge simulator, K-Sim Navigation.

The new simulator is claimed to meet the requirements of the most demanding navigation training for most types of vessels.

Designed for future advanced and integrated simulation training, K-Sim Navigation is based on a new technology platform enabling more realistic training scenarios and enhanced user benefits for both instructors and students.

The simulator features a physical engine and hydrodynamic modelling, allowing vessels, objects and equipment to behave and interact as in real situations. To further enhance the realism, a new visual system is included, claiming to bringing vessels and objects in all possible weather conditions to life.

The result of these improvements is, according to Terje Heierstad, global product manager, Kongsberg Maritime Simulation: "A fully immersive and optimum quality simulation experience. It's a step change in maritime simulation. The shipping sector doesn't stand still and neither do we. Using our 40 years of simulation experience, it was our goal to take ship's bridge simulation to the next level."

K-Sim Navigation has been developed with the user experience firmly in mind, the company said. In addition to a realistic environment for students, instructors benefit from a system designed to facilitate ease of use.

It features an intuitive educational tool utilising a modified ECDIS chart as a starting point with drag & drop function for creating exercises. The instructor system also includes automatic recording and an advanced assessment system for ensuring optimal training and feedback standards.

"Instructors are perhaps the key link in the training value chain, so we wanted to give them the ability to create the most advanced training scenarios, with the utmost efficiency and ease," explained Heierstad. "Flexibility is also crucial, giving instructors the capacity to adjust exercise parameters before and during simulations to provide the best quality training for every individual student."

K-Sim Navigation's flexibility also extends to hardware, with a range of options available – from a PC based desktop system, through to a full mission bridge simulator. The system, built on the same technology platform as the K-Sim Offshore simulator, can easily be integrated with other Kongsberg Maritime simulators (including crane, offshore, engine, cargo, ballast and DP) to enable a comprehensive range of training scenarios.

Already approved to DNV GL Class-A standards, the simulator suite allows maritime schools and academies to extend their available portfolio of courses, while in addition, providing them with the controlled environment necessary for undertaking valuable research projects, Kongsberg claimed.

"We believe that the new functionality and realism we have developed for K-Sim Navigation is an essential building block for enhancing sea skills and thus providing safe, secure and reliable vessel handling. Which, at the end of the day, is what maritime simulation is all about," Heierstad concluded.

Answering the question about the training simulator market, Tone-Merete Hansen, global sales manager (simulation), Kongsberg Maritime, told *Tanker Operator*; "We see a trend within the maritime sector where shipowners and operators are looking for training and simulation beyond regulatory requirements, such as defined by STCW and The Nautical Institute.

"This means that the simulators also have to exceed the minimum requirements; hence we find that shipowners and operators are looking for increased realism in hydrodynamic modelling and interaction between objects, the vessel and the environment.

"Simulations are used for training on own procedures and operations, test and pre-simulations of specific operations and even marketing purposes; to prove and validate operations in the simulator for clients. This is one of the driving forces for K-Sim Navigation.

"As the maritime sector is becoming more professional/academic/research based, simulators are increasingly being used as facilitating R & D projects.

"K-Sim Navigation offers the controlled environment required in research projects and all parameters can be exported to various formats, allowing for further analysis.

"Offshore training centres like to train not only on offshore and DP operations, but also navigation and shiphandling. Many clients extend and invest in more simulators because simulator training is proven to be effective, saving time and costs, reducing risk and accidents." he said.

TO

Terminal designs simulated at new facility

The UK's HR Wallingford's UK Ship Simulation Centre and the Fast Flow Facility at Howbery Business Park was officially opened at the end of October.

These new facilities will be used to simulate the conditions in coastal and offshore waters, allowing them to assess and improve the way ports and terminals perform before they are built.

The Fast Flow Facility is the most recent addition to HR Wallingford's physical modelling facilities. The 75 m long, 8 m wide dual-channel flume can hold 1 mill litres of water, generate 1 m high waves and produce fast tidal currents to simulate the way waves, tides, sediments and structures interact.

The UK Ship Simulation Centre houses the latest advanced navigation simulation technology - four real-time ship simulators, including two dedicated tug simulators.

Each simulator is a functioning ship, or tug's bridge, surrounded by a 360 deg simulated environment. The four simulators can be run separately, or together to allow different vessels in the same simulated environment to interact. They can also link with the six simulators located in HR Wallingford's Fremantle Ship Simulation Centre in Australia.

In total, HR Wallingford operates 10 real-time navigation simulators, four in Wallingford and six at Fremantle, Western Australia.

In conversation with *Tanker Operator*, it was explained that the simulators are mainly used for port and terminal design. "We set up site specific simulation models and use them to examine ship navigation and manoeuvring for new port, or terminal designs and modifications to existing ports/terminals.

"They are used to test the requirements for safe approach channel and manoeuvring area layouts and their dimensions (width and depth), identify the limiting environmental conditions (wind, waves, current and tidal levels) for safe manoeuvring operations, and the associated tug requirements (number, size, capacity), along with enabling the design and layout of aids to navigation (buoys, beacons, leading marks) to be evaluated.

"Although we mainly undertake port and terminal design, we also undertake specialist maritime pilot and tug master training, as having configured the simulators to examine a new design layout, it is then straightforward to use the simulators to help familiarise the local pilots and tug masters with the new layout.

"In addition, we carry out other specialist pilot and tug master training, such as escort towage, offshore terminal operations, ship-to-ship manoeuvring techniques and offer continuing professional development courses for a number of ports and terminals worldwide.

"We do not undertake basic training, or standard courses (such as STCW, or BRM courses) as we leave that to the nautical colleges. All of our training is at the specialist, shiphandling end and so we deal with mariners who are already experienced," a spokesperson explained.

Worldwide training

HR Wallingford routinely carries out port design studies and associated training worldwide. For example, the ship simulation centre in Fremantle, Australia, carries out specialist training courses for escort towage, heavy lift and construction vessels, along with CPD courses for a number of Australian ports.

All of the simulators can be linked, enabling ship and tugs to interact within the same simulated environment, along with other

One of the simulators at Wallingford.

ships in passing, or overtaking, scenarios.

The simulators and software are all of HR Wallingford design. As most of the work is port/terminal design related, the simulator operators need to have control over the software so that developments can be carried out to a customer's requirement. Simulator configuration flexibility is also needed so that the port design can be adapted during a simulation session, if the early simulation exercises show that the initial design needs to be modified.

When training, the focus is on hands-on time on the simulators, so courses are often run with more than one simulator so that the participants can maximise their hands-on time. The maximum number of participants per simulator is usually three, as any more would reduce the simulator time per participant to an unacceptable level.

HR Wallingford is not a training centre, but an international research and consultancy organisation in civil engineering and environmental hydraulics that uses simulation as a tool in port and terminal design, and as a tool in the specialist training of pilots and tug masters.

"As we have access to some of the world's leading experts in civil engineering hydraulics, any issues that arise regarding the environment, dredging, shiphandling or the environmental impact when using the simulators to examine ship navigation and manoeuvring, can be answered by our staff," the spokesperson explained.

As for the Fast Flow Facility, this will be used to examine all aspects of sediment movement and scour under the combined action of waves and currents. As such it will be used to test and examine the designs of port structures and so will benefit tanker jetty design and hence its operation, the organisation said. TO

When fact follows fiction

A recent report published by the UK's Maritime Accident Investigation Branch (MAIB) highlighted how fact occasionally follows fiction.

In March 2013, Walport/TRAININGlink released a film entitled 'The Human Element', developed with the UK MCA and other partners.

A little over 18 months later, MAIB released a report in November into the grounding off the UK coast of the LPG carrier *Navigator Scorpio*.

Key similarities:

- A passage in potentially hazardous waters.
- An unchecked passage plan.
- The Masters' ineffective handling of a potentially hazardous passage

The OOW becoming distracted and losing situational and positional awareness.

- Ineffective monitoring of the vessels position.
- An avoidable grounding incident.

The circumstances leading up to the two incidents, fictitious and real, were similar. For example, MAIB found that the *Navigator Scorpio* ran aground in restricted waters after the OOW became distracted and lost positional awareness.

The OOW in 'The Human Element' was similarly distracted by the paperwork for a safety audit he was trying to complete and he too lost situational awareness and failed to accurately confirm his vessel's position. TO

Raytheon Anschütz to fit INS on MRs

Raytheon Anschütz is to deliver its new NX generation Synapsis integrated navigation systems (INS) to two newbuilding chemical tankers, among other vessels.

The INS will be delivered type-approved according to IMO´s new INS performance standards MSC.252(83) and IEC 61924-2.

The Synapsis NX architecture is based on an ultra-compact and powerful small marine computer, which serves as the standard hardware platform for all bridge applications.

Software modules for (chart-) radar, ECDIS, or conning – each the latest software version - can be added to scale the workstation from a stand-alone workplace for radar, or ECDIS, up to a fully integrated multifunctional workstation, with the option for simple upgrades and extensions whenever operational requirements may change. The new NautoPlex data collector completes the core of the new Synapsis NX network infrastructure.

Raytheon Anschütz will supply INS, based on the new architecture, to two new 50,000 dwt chemical/product tankers building for the Spanish shipowner Marflet Marine at the Croatian 3. Maj shipyard.

The scope of supply includes four Synapsis multi-functional workstations, the new NautoScan NX network radar transceivers, the NautoSteer AS steering control system, including NP 5000 autopilot system, as well as a complete sensor system and radio equipment.

In addition , the company has already won 14 INS contracts that include the new Synapsis NX, for different vessel types.

In total, Raytheon Anschütz has contracted more than 100 Synapsis INS since its launch two years ago. The INS provides full integration of sensor data and other information, such as AIS, NAVTEX, charts, radar, centralised alarm management, system status display and reliability indication for important sensors.

A software framework forms part of each workstation, which concentrates all the navigation system's services and tasks.

At SMM, the company officially launched the NautoScan NX network radar transceivers, the centerpiece of their next generation Synapsis Radar system.

The transceivers generate raw radar video, which is distributed via Gigabit LAN. Raw video distribution without any analogue losses enables optimised performance with high-fidelity radar data processing through the individual end-user applications on the bridge.

Dr Axel Schaab, Raytheon Anschütz's product management head, said: "We've listened to the market and heard the demand for newly developed, state-of-the-art navigational radar. Consequently, we leveraged our experience and extensive radar knowledge and started the in-house development of a very competitive and modern radar. The new radar is based on network technology and has undergone a complete redesign electronically and mechanically to combine great performance with high reliability."

An unlimited number of workstations and applications can be linked to the LAN to receive the radar video. A star-based network approach offers highest scalability and flexibility for a wide range of applications and requirements without need for special cabling or conversion hardware.

As part of the complete system redesign, critical parts such as the drive unit have been optimised to provide customers with maintenance-free operation and an extended life. Features such as automatic performance monitoring, or a Magnetron sleep mode for longer maintenance intervals are now integrated in the system.

In addition, installation and maintenance access have been improved through a new pedestal design. Simplified assembly and configuration, as well as use of standard Ethernet, will lower installation efforts; built-in test features are available for advanced service diagnostic and optimised service performance. All electronic and RF components are mounted on an innovative, removable tray to simplify and speed up service.

Besides integrating the new radar transceivers, the new generation Synapsis Radar is built on the new NX system architecture. The radar is part of the Synapsis NX multifunctional workstations, which integrates all navigational data, tasks and services to enable users full data control with a single action.

A typical Raytheon-Anschütz INS layout.

SAM Electronics addresses the human interface

SAM Electronics, an L-3 company, remains one of the major navigation equipment suppliers.

Its mainstay is the supply and installation of the NACOS Platinum series of integrated navigation automation control systems on board all vessel types and sizes, including tankers.

The successor to the earlier NACOS integrated navigation command and control systems, of which over 1,700 are operational worldwide, the latest Platinum series includes new standards of functional integration with the adoption of identical components and a common operating network based on carefully-researched HMI (human machine interface) design principles, SAM claimed.

These principles, which cover essentials, such as displays, menus, switches, controls and audio signals, basically govern simplified and more efficient ways in which users interact with equipment free of unnecessary stress, or distraction.

Typical architecture of an intuitive system, which can extend from a small alarm type, or a stand-alone ECDIS assembly, to more complex configurations found on modern tankers and other vessel types, basically features a number of identical bridge task workstations. Each is capable of carrying out key navigation functions, such as route monitoring, collision avoidance, control of data and alert management.

A SAM Electronics NACOS Platinum navigation automation control assembly embodying functionally integrated human machine interface (HMI) design principles.

All workstations are connected by a redundant network using a common database reflected on most if not all consoles. It should be noted that issues, such as information redundancy and inconsistency and any differing interfaces have been resolved by the use of HMI design methods, SAM explained.

A typical example of this ergonomic approach is the development of a purpose-

designed navigation data display sidebar, which is consistently available for all applications so that users will always find all necessary data at the same place - and in the same arrangement at all times.

Thus a NACOS Platinum assembly is claimed by the supplier to provide true network system architecture with modular components encapsulated in functional entities for highly efficient data distribution around its network. Moreover, once any new component is added to the network, its data is readily available and accessible from any workstation.

This versatility extends equally to increased levels of scalability so that facilities for secondary applications, such as overall machinery control of ship operations, power management, cargo control, emergency shut down and ballast water management can all be added to a basic automated navigation configuration.

Typical assembly

A typical navigation assembly for medium to large-size tankers will generally comprise a number of X and S-band SAM IP radars, which, by way of connection to a vessel's own IP network, enable real-time images to be readily accessible from any subsidiary workstations, or bridge wing monitors.

Conforming to latest IEC 62388 Ed 2 performance standards, in turn the radars will be linked to a selective number of all-purpose Multipilot workstations for combined display of ARPA, radar, ECDIS and conning functions, in addition to those for automatic steering control and voyage planning supported by associated consoles.

Supplementary navigational data is provided by easily-interfaced secondary sensors, such as those for AIS, differential GPS, doppler logs, echo sounders, gyros, rudder steering, wind/weather navaids and not least, a bridge navigational watch alarm system (BNWAS) now demanded by latest IMO carriage requirements; and in readiness for regulations effective next July for inclusion of ECDIS on tankers of 3,000 gt and above, EcdisPilot Platinum, or Basic systems, can also be retrofitted wherever necessary.

A system will also include an integrated voyage data recorder (VDR) unit operating via radar to provide navigation sensor data, as well as digital radar and ECDIS images via an on board Ethernet ring connection link. Similarly, GMDSS and satellite communication facilities can be optionally added to a basic navigational assembly.

With the development of latest NACOS Platinum systems, SAM Electronics has also extended its general support facilities with introduction of optional remote servicing and maintenance of assemblies available 24/7 via any broadband satellite connection.

This can save shipping companies substantial sums of money by eliminating staff downtime while also avoiding costly disaster recovery services in the unlikely event of any critical systems failure, SAM said. With a firewall isolating a vessel from the outside world, requests for specialist assistance can only be securely activated by a Master using an integrated router connected to SAM's Data Service Centre in Hamburg.

A comparable system support option, which also makes full use of standardised open architecture is recent development - Fleetpilot Platinum. This provides shipowners and managers with the ability to monitor key performance aspects of seagoing ship performance and behaviour, either on an individual basis, or across an entire fleet.

Using secure web-based software, the centralised facility has been developed using the versatile user-centred design process, which characterises the entire NACOS Platinum range of systems now being commissioned worldwide in increasing numbers.

GNS introduces a vessel management service

Last year, fledgeling navigation products and service provider, Global Navigation Solutions (GNS) considerably boosted its presence worldwide by acquiring three companies from the Harrison Maritime Group.

This move came a few months after the acquisition of German-based distributor and service provider HanseNautic.

GNS commenced operations in November 2012 with the purchase of Thomas Gunn, a major distributor of UK Hydrographic Office/Admiralty navigational charts and publications and provider of own brand chart management and route planning tools, such as the Voyager brand.

Today, GNS is involved with the distribution of navigational aids, such as charts and publications in eight countries and has around 10,000 vessels on its books.

Not stopping there, at September's SMM, GNS unveiled Vessel Management Service (VMS), which the company claimed was the first integrated management system for total navigation compliance.

The service was introduced to give shore-based shipmanagers more control of navigation compliance, save money on chart purchases and save time on navigation related administration. This new service is offered free of charge to GNS customers.

VMS enables the shore-based management team to better monitor and control navigation compliance across their fleet, the company said. It does this by highlighting whether the ships in the fleet have applied all the relevant chart and publication corrections and where not, it enables them to take any corrective action

GNS offers UKHO's AVCS support for its ECDIS.

necessary to avoid navigation-related issues during port state inspections.

The service also flags up charts and publications, which are due to be withdrawn and where digital permits are about to expire, making it easier for shipmanagers to keep inventories up to date and compliant with SOLAS V regulations.

While chart compliance aides crew safety, it also ensures vessels can meet the increasingly robust approach to compliance, which is being exerted not just by port authorities but also in wider areas. Evidence of this was recently reported, when a record fine was sought from a major shipping company for not carrying up to date charts while navigating an ecologically sensitive passage.

VMS also helps save money on charts and publications costs by enabling shipmanagers to reduce the number of unnecessary charts purchased. Users of the service are able to view the paper and digital charts and publications requested by their ships on a map-based interface overlaid with the vessel's route before authorising the requisition.

A simple web-based tool is provided to access all the navigational information in use across the fleet, on a vessel by vessel basis, which gives instant access to their full purchasing history with GNS, thus saving admin time. Furthermore, as a web based service, VMS is easily accessible on PCs, tablets and smart phones providing shore-based managers with easy access to the information anytime and anywhere.

Commenting on the VMS launch, Mike Robinson, GNS CEO, said: "Use of VMS takes e-Navigation to a new level, by providing shore-based managers with levels of information, which were previously only available on board a vessel. We also believe that shipmanagers using VMS will quickly benefit from better control of purchasing costs and significant time savings.

"With port state authorities like Paris MoU, reporting that deficiencies recorded under the 'Safety of Navigation' category have recently risen to nearly 14%, our new Vessel Management Service couldn't come at a better time for our customers. We are delighted to be able to offer this new service to GNS customers free of charge," he said.

In addition, GNS launched three new services - a new free 'essentials' package, an upgrade to the Voyager planning station dashboard, plus a new bundle purchasing option.

With effect from 1st October, 2014, GNS customers can use Voyager essentials package free of charge. This will enable vessels to benefit from GNS's navigational purchasing and information management tools irrespective of whether they are using chart updating and other added value services on board.

Vessel's using this package can save time by using its route planning and chart inventory management tools, as well as benefiting from easier navigation purchasing and compliance by using its map based product catalogue and simplified order management system.

When used in conjunction with the new VMS service for office personnel, shipmanagers gain better control over navigational costs and reduce time spent on related administration, GNS said.

Also launched was the latest upgrade to its Voyager planning station, which has the added benefits of a new dashboard access point providing customers with a wide range of safety and efficiency enhancing tools, together with the integration of tidal information provided by the ADMIRALTY TotalTide product.

Considerable investment

Voyager's new interface design is the result of significant investment by GNS to create a new standard for navigation software. Working with UX (user experience) specialists, GNS has used first principals to restructure how the software is used. The result is a simpler, more elegant solution that makes Voyager even easier to use and enhances efficiency on board even further, the company claimed.

Voyager is a back of the bridge updating planning station in which, the software has been kept simple to access and use. It can be accessed ashore by using the VMS.

Finally, as part of the transition to digital, GNS has unveiled a new method by which customers are able to purchase its navigation services - a bundle purchasing facility.

This provides an easier, more affordable way for shipmanagers to purchase charts and publications, in both paper and digital format. It also significantly improves the cost and simplicity with which newbuildings can be fitted out with an initial chart and publication inventory to a vessel's the flag state approval, which currently varies from state to state.

The new GNS Bundle includes a complementary quarterly review of the chart and publication holdings on each vessel in the fleet, to ensure the optimum mix of charts and publications is held at all times, either in paper, or digital format.

A monthly payment plan can be agreed, estimated every year, reducing the shipowner/manager's admin on the production of purchase orders and invoicing to just a single purchase order per year.

For ECDIS, GNS offers UKHO's AVCS support but is able to distribute Jeppesen's ENCs if requested to do so, Robinson explained. He was convinced that despite the ECDIS mandate, in five years time there will still be a need for paper charts on board a vessel.

TO

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New software and INS from Transas

Transas Marine introduced new software solutions for voyage planning and fleet management at SMM 2014, plus a new bridge layout.

Transas Navi-Planner 4000 is now available on a touch screen display. This offers a new method of voyage planning on a 46-inch multi-touch display, the company claimed.

Navi-Planner combines ENC's, weather data, digital publications, Notices to Mariners, piracy updates, fuel monitoring and other functions to help optimise port-to-port voyage with just a touch of a finger.

Transas has also enhanced its FleetView Online fleet tracking service, by offering extensive functionality to its users through one interface. The improved service now includes online chart and data management, fuel efficiency monitoring, piracy information overlay, in addition to fleet tracking and ship security functionalities already available.

A route exchange has also been added, whereby the monitored route in ECDIS is sent to and displayed by FleetView Online to fleet managers ashore. In the future more information will be automatically exchanged between ship and shore, giving ship operator the full picture of vessels' performance and how they transit a route, with all information combined in one online portal bridging the gap between ship and shore operations.

New INS

T-Bridge is claimed to be the most advanced integrated navigation system (INS) where professional bridge equipment meets aviation, automation and even tablet technology.

This INS brings together diverse systems into a single bridge environment, where data sources are combined to provide a full and clear picture to support efficient decision-making.

Solid, timely and pertinent access to all crucial information is the key to safe and secure navigation, the company said. Transas claimed that it had designed a bridge solution to add further safety to navigation, to simplify bridge operations and to offer highest flexibility for customised bridge configurations, putting the operator at the heart of the system.

In limited visibility, congested, or shallow waters, at night, or in poor chart coverage areas, Transas Augmented Reality technology provides the ultimate picture - sensor input from the forward looking sonar, chart data or position and route data are integrated with live video of the surroundings.

As the navigator sees a picture of the real surroundings combined with all relevant information on one screen, it becomes easier to make the most informed & optimal decisions, the company said.

Bringing aviation technology on board, Transas has integrated a powerful searchlight with camera and thermal imager into the bridge system allowing easy detection and identification of objects in virtually any visibility conditions.

A new level of wheelhouse automation based on the the company's touch interface will give the crew intuitive and consistent access to all automated information and allow for the control of an interactive Transas Navi-Conning system, which can be customised to suit any bridge configuration.

To complement its bridge solution, Transas has also developed an iPad application, which is directly linked to the navigation system and gives access to the navigational information related to the vessel, including, for example, position data, AIS targets, speed, course, water depth and other information.

Transas has also teamed up with KVH Industries designed to ensure vessels receive affordable, timely updates of mandatory electronic chart data.

The CHARTlink channel of KVH's IP-MobileCast content delivery service will support delivery of chart and other data updates from Transas. This is the first of many steps envisioned by Transas for delivery of value-added data for shipboard use with the IP-MobileCast service, the companies said.

A ship equipped with KVH's TracPhone V-series or V-IP series satellite communications antenna systems, which are designed for the mini-VSAT Broadband network, can subscribe to IP-MobileCast's CHARTlink service and receive chart updates automatically. The Transas ENC updates are designed so that they can be received, unpacked, and deployed without user intervention, a key aspect of compliance with maritime regulations and overall service quality, the company claimed.

KVH and Transas plan to commercially roll out the service before the end of this year, subject to ongoing co-operation and final agreement between the parties.

In another move, Transas has selected Danelec Marine to be one of the company's suppliers of Voyage Data Recorders (VDRs). Under the agreement, Transas became an authorised partner for Danelec, providing VDRs for newbuilds and retrofits through its sales offices and representatives worldwide.

Danelec DM100 is the first VDR type approved and Wheelmarked under the new IMO standard, which came into force 1st July, 2014. Since that date, all new VDR installations, including newbuildings and existing ships, are required to comply with the new standard. TO

Transas' T-Bridge layout.

Remote communications now possible on board

A recently introduced power line communication (PLC) solution has generated a lot of interest among shipowners, according to one of its leading suppliers.

The industrial grade system enables a vessel to become a large IP enabled LAN by injecting a signal into the vessel's copper cabling with the result that all of the power sockets on board become IP network points.

These can be used for operating PCs, Wi-Fi, CCTV, telemedicine, RFID tracking, monitoring and reporting equipment, plus other functions without the need to re-cable the vessel, or add additional cabling.

The solution only takes around three hours to install enabling the vessel to become future-proofed for all and any network dependant applications, or services, as and when required without taking the vessel out of service.

This solution was developed by FDN Marine, for which Setel is a master partner, reselling the system to the marine industry in the UK and in Greece, through Setel Hellas.

Setel's UK-based sales director Sebastian Moore said that the PLC was a very simple solution, which can give access to outside communications on board a vessel wherever there is a power socket fitted.

FDN's headend can be fitted in a vessel's control room on the main distribution board.

Moore told *Tanker Operator* that the PLC can be used on any type or size of vessel, or offshore unit and several companies, including BP Shipping, Maersk, APL and Zodiac have installed the solution on board part, or all, of their fleets. BP has been using the solution for two years, since it entered the market, on 50 vessels without any problems reported, Moore said. The company has now rolled it out across its entire fleet, including the newbuildings.

He claimed that the solution neatly solves all the on board networking/cabling and connectivity problems that can be encountered. Networking has traditionally been a problem at sea outside of the accommodation block but once an FDN headend has been installed in the main distribution board in the engine control room, a digital signal is injected onto the electrical and lighting infrastructure across the whole vessel and then FDN CPE and WAP units can then be deployed in any location. Data, voice and video can be accessed using the plug and play technique.

Networks

Permanent, or temporary networks can be created using the plug and play system. The PLC headend is described as 200 MB high capacity industrial grade technology and it is fully EMC compliant for vessel use, able to operate in temperatures of between - 40 deg C up to + 85 deg C and in humidity of between 10-95%.

FDN Marine's CPE is used to communicate with the headend to provide local connectivity to items, such as wireless access points, PCs, monitoring equipment, or CCTV cameras. The WAP CPE delivers the Wi-Fi network.

One tanker operator has installed 12 CCTV cameras on board vessels mainly as an anti-piracy deterrent. If an incident occurs, the crew can muster in the citadel and still have communications access to the outside world by using the plug and play system providing there is a socket in the citadel. As many cameras, Wi-Fi units and LAN points can be installed as required and connected up to the system.

Another example of its usage is in the event of an accident to a crew member in an area of the vessel that is difficult to access. In this situation, seafarers can use the plug and play via Wi-Fi to get help and connect to a shore-based telemedicine concern should this become necessary.

Since the Maritime Labour Convention has entered into force, crew welfare has come to the fore. Here the plug and play solution can be used by seafarers to keep in contact with friends and family while on board ship via satellite communications from their cabins, or for downloading training material, or give intranet access. The amount of satcoms usage can still be controlled as per the company's policy.

Moore said that the system is virtually future proof as it could work with IT systems that are still some way off being introduced, or even designed. He also said that it was very cost effective to retrofit as re-cabling at shipyards incurs considerable expense due to the copper being an expensive commodity.

Setel operates worldwide in the aviation and land-based sectors, as well as in the marine industry with offices in Singapore and Dubai. Thus far, the PLC is being marketed in the UK and Greece. However, Moore is about to recruit a Norwegian concern to look after Scandinavia and possibly northern Germany, from Hamburg.

FDN Marine started to use this technology some 12 years ago and launched it onto the marine sector about two years ago.

TO

A light is appearing at the end of a long dark tunnel

The meeting basically agreed that the technical standards and approval testing procedures in the guidelines for approval of ballast water management systems (G8) will undergo a comprehensive review. As a result, a correspondence group was established to initiate the review.

MEPC 67 also agreed that the so called 'early movers'- shipowners that have already installed type-approved ballast water management systems prior to the application of the revised guidelines (G8) - should not be penalised and that port states should not apply criminal sanctions, or detain the ship, based on sampling during a trial period (grandfathering).

Other agreements included a plan and terms of reference for a proposed study on implementation of the ballast water performance standard. This includes the water quality for discharge, related to specified maximum concentrations of viable organisms.

This study would include stakeholder surveys and collection of data on similarities and differences in existing practices regarding to type approval and testing of BWM systems and practices relating to analysing their performance after installation on board ships. The final study report is to be submitted to MEPC 69, which is scheduled for early 2016.

BWM Convention's ratification drew nearer with both Japan and Turkey ratifying the convention. By the end of the meeting, some 43 states having control over 32.54% of the world's tonnage had ratified it. Despite the number of states being sufficient, the world's tonnage covered by the member states needs to reach 35%. Once this position is reached, the BWM becomes ratified and will enter force 12 months after the date of final ratification.

At the October IMO MEPC 67 meeting, resolutions were adopted surrounding the type-approval of BWM systems and guidance for Port State Control inspections.

However, it is anticipated that the entry-into-force criteria will be met shortly, as a number of states have indicated to the IMO that they are making arrangements to deposit their instruments of accession very soon.

It is believed that only around 1,000 plus BWTS have been installed thus far and 3,000 ordered out of a possible 60,000-70,000 vessels that will need equipment fitted once the convention is ratified.

USCG position

For those vessels operating in US waters, or intending to sail into US waters, the scenario is slightly different and more costly.

The US Coast Guard's (USCG) ballast water discharge standard applies to vessels equipped with ballast water tanks and operate in waters of the US.

The rule does not apply to non-seagoing vessels, sea-going vessels that do not operate outside the exclusive economic zone and are less than 3,000 gt and vessels that operate exclusively in one port zone.

New vessels, with a keel laying date after 1st December, 2013, are required to comply with the regulations upon delivery. The implementation dates for existing vessels are based upon a vessel's ballast water capacity.

Vessels are required to comply at their first scheduled drydocking after:

- 1st January, 2016 for vessels with ballast water less than 1,500 cu m.
- 1st January, 2014 for vessels with ballast water between 1,500 to 5,000 cu m.
- 1st January, 2016 for vessels with ballast water over 5,000 cu m.

"We are in the implementation phase of the regulation. If you have a vessel that has a ballast water capacity of 1,500-5,000 cu m, your compliance date is the first drydocking after January 2014," Commander Ryan Allain, Chief, Environmental Standards Division, US Coast Guard said at a recent conference. "If you have a drydock coming up, you need to be making plans for how you will comply with regulations. There are several ways you can do that"

Basically the USCG's rules are -

- Do not discharge ballast water within 12 nautical miles of the US.
- Install a USCG approved ballast water management system.
- Discharge to a facility onshore, or to another vessel, for purposes of treatment.
- Use only water from a US public water system.

However, there are temporary compliance options -

- Install an alternate management system (AMS), which is a temporary designation, given to a ballast water treatment system,

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which can be used on a ship for up to five years after the ship's implementation date.
- Receive an extension for the ship's implementation date.

"Coast Guard type approval regulations have little tolerance for interpretation, or compromise. We have to follow the regulations as they're prescribed but there is an option for the Coast Guard to consider alternatives," Cdr Allain explained. "If a specific evaluation, or required test that is indicated in the Coast Guard's type approval regulations is not practicable, or applicable for that ballast water treatment system, the vendor can come to the Coast Guard and request approval of an alternative. The request for an alternative has to demonstrate that it is equal to or exceeds the Coast Guard requirements."

Alfa Laval's PureBallast filtrex filter.

Temporary acceptance

An AMS, mentioned above, is the USCG's temporary acceptance of a treatment system that has been approved by a foreign administration in accordance with the BWMC.

Once AMS acceptance is granted to a system, that system is deemed to be at least as effective as a ballast water exchange.

Cdr Allain said;"We have 45 AMS acceptances out there. The Coast Guard expectation is that if you have an AMS acceptance that you have started your type approval programme. We want to hear details on where you are at in your type approval programme, We want to know where you are at with this. I think it would be very beneficial for all of us."

While going through AMS reviews, the USCG said that it saw a lot of inconsistencies in testing that was done to achieve foreign administration type approval.

"We notice lack of quality assurance and quality control; and use of testing procedures that weren't independently validated," Cdr Allain said. "At this time, the Coast Guard has not received any formal application for type approval. We are aware that there is testing going on but we are not aware of where exactly most vendors are in the process and what their timelines are for completing the testing process and sending a type approval."

In the wake of MEPC 67, most OEMs contacted by *Tanker Operator* believed that a strong and positive signal was given. However, it is now generally accepted that no one BWT technology will fit all types of vessels and all usage profiles, hence some of the OEMs have opted for different capacity sizes. For example, **Alfa Laval** said that the discussions in the working group at MEPC 67 were very constructive, including the committee's acceptance of a resolution addressing most industry concerns related to robustness of G8 protocol and the so called 'grandfathering'.

In parallel with the IMO convention, it is expected that the US Coast Guard (ETV protocol) will have an impact, especially since it is expected that the first type approved systems will be available during 2015. "We already see an increased activity with some customers starting to execute their retrofit plan and others that are just about to get started with early technical discussions underway," the company said.

Alfa Laval saw the USCG's technical demands setting a high standard giving a potential for a more robust G8 protocol. Suppliers will need to satisfy the various requirements to gain certification, leading to an improved outcome for shipowners and operators.

"When it comes to selecting a BWTS system, we see that the customers will be more discerning and will opt for suppliers that are addressing the criteria and are active in the certification process. We believe that many customers will in addition to the technical considerations also evaluate the ballast water manufacturers service, spare parts and support capabilities and the after sales network being offered by the manufacturer. We also see customers viewing the total cost of BWTS ownership programmes, rather than the pure initial investment costs of a system," the company said.

Through its network of sales, service companies and business partners, the company can provide the necessary services for both newbuildings and the retrofit requirements. "We work with trained and authorised

engineering companies that can assist the customer in all aspects of the project, as well as shipyards in the constellation. The main focus is to support the customer before, during and after the installation and this philosophy is extended through to commissioning and operational support into the future,"Alfa Laval said..

Alfa Laval offers systems up to 6,000 cu m per hour, which consists of two systems with a capacity of 3,000 cu m per hour, with the capability to operate in all three salinities and down to a UV-T of 42% at full flow.

"With a product portfolio consisting of three different reactor sizes, 300, 600 and 1,000 cu m per hour, we have the flexibility to provide solutions for a wide range of vessel sizes, types and applications, providing a perfect fit with small footprint and minimised energy consumption," the company said.

At SMM, Alfa Laval unveiled an alternative filter option for PureBallast 3.0. This compact new Filtrex filter allows the system to operate in fresh, brackish and marine waters with a UV transmittance as low as 42%, the company said.

"Alfa Laval PureBallast 3.0, equipped with the Filtrex premium filter, has been tested and approved for use in very challenging water," said Alfa Laval's Peter Sahlén, R&D manager, PureBallast. "The sustem to operate at full flow down to a UV transmittance of 42%, which provides a high margin of security for vessels that operate globally."

UV transmittance in harbours normally varies between 60% and 90%, research has showed. However, UV transmittance as low as 49% has been measured in some cases.

Denmark-based small to large capacity BWTS manufacturer **Bawat** has its equipment type approved by DNV GL and expects to receive the IMO approval at MEPC 68, which is scheduled for 11-15th May next year, CEO Kim Diederichsen told *Tanker Operator*. In addition, USCG AMS approval is expected by the end of this year.

Although the company is marketing for both newbuilds and retrofits, Diederichsen said that all of the current 'request for quotes' received are for retrofits.

Bawat conducts system design and configuration using the company's own in-house engineering expertise and also third party concerns and some of the external sources are in tie-ups with the company. "The shipyard will conduct the installation - we can support with supervision and commissioning expertise," Diederichsen explained.

He also claimed that Bawat BWTS works with all ship sizes and in all types of water - salt water, brackish water and fresh water.

Large capacities

Among the manufacturers to opt for the high capacity market- large tankers, bulkers and LNG/LPG carriers. is UK-based **Coldharbour Marine**, which is currently going through a type approval process with the UK MCA and Lloyd's Register.

Coldharbour told Tanker Operator that it had been studying the market for about 18 months and has identified around 7,500 vessels that could be fitted with the company's system out of which, about 3,000 were described as a perfect fit.

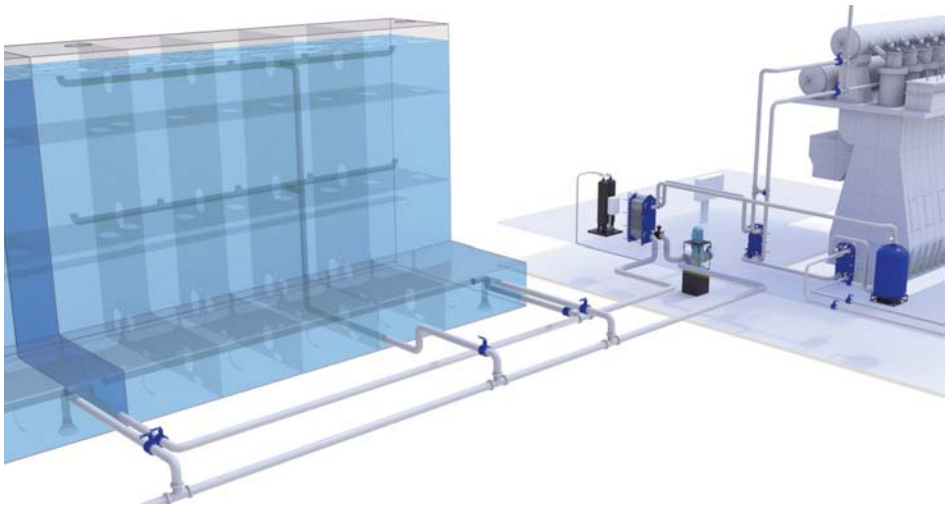
The company claims to have a totally unique approach to the problem in that its BWTS is not an in-line system, nor does it treat the ballast water at the uptake. Therefore, there are no filters and concerns over flow rates, pressure drops and power consumption is irrelevant. Ballasting and de-ballasting can continue as normal.

During its market studies, the company made the following observations - owners and operators are sitting in three distinct camps, as far as the fitting of BWTS is concerned.

Coldharbour dubbed these as - Ostriches, Chickens and Eagles -

Ostriches:

- Have done little, or no research.
- Do not plan to do anything until after ratification.



Bawat's BWTS expects to receive IMO approval at MEPC 68.

- Tend to think it will be a buyers' market, not a sellers' market.
- Tend to think prices will come down.
- Tend to think that enforcement is still a long way off, even post ratification and passing into law a year later (on the basis that monitoring, sampling and enforcement regimes will not be in place).
- Are adopting a wait and see attitude.
- Sticking their heads in the sand like ostriches!
- Ostriches are in for a big shock, they will get 'Hobson's' choice when it comes to system selection, availability and price at the bottleneck.
- Running a high risk of non-compliance.

Chickens:

- Have done all of their research.
- Know the market, vendors and technologies inside out.
- Have been involved in detailed surveys and technical exchanges with vendors and retrofit service providers.
- Have very likely made their choices and decisions as to what they will fit to which vessels, and when.

Trojan Marinex BWT 250 (see page 37)

- Will very likely get the right system, delivered on time.
- However, chickens are not moving ahead with order placement, they are still awaiting ratification.
- Chickens have laid their egg, they are now waiting for it to hatch.

Eagles:

- Eagles are soaring high above the others.
- They have done everything the chickens have done but are actually moving ahead.
- Not waiting for ratification.
- They are placing orders, and have moved even beyond early adoption and pilot installations.
- They have the pick of the crop, will have negotiated bulk prices and will have sowed the seeds of a good co-operation with vendors, to ensure mutual well being.
- The retrofit programme for the fleet is mapped out and in place.
- They are assured of the right system, at the right price, delivered on time.
- They've done the best they can, in good faith, ahead of the game.

As for engineering and installation, Coldharbour said that it aimed to be flexible - offering its own solutions in a full turnkey project, or linking up with retrofit engineering concerns and shipyards. The company acknowledged that the South Korean market will be difficult to break into, as the shipyards tended to dictate the equipment supply.

To cope with the expected ordering boom, Coldharbour will move to new premises by the end of this year giving the company around 24,000 sq ft of space. At the same time, the number of employees will be increased from just under 40 to around 90-100.

Dutch engineering and shipbuilding/repair group **Damen** has partnered with **Trojan Marinex**, **Bio-UV** and **Evoqua Water Technologies**. They all have BWTS that are IMO type approved and USCG AMS accepted.

Based on the vessels characteristics, operational requirements and customers preference, Damen's BWTS engineers will select the most appropriate system for retrofitting. By working with these selected partners, Damen can provide high-quality competitive retrofit packages for all vessel types, the company claimed.

Damen will use 3D scan techniques to create a customised engineering package. BWTS installation can be undertaken at one of the Damen Shiprepair & Conversion shipyards located worldwide. However, systems can also be installed at a customer selected non-Damen yard, or during normal operations, the company said.

Gert-Jan Oude Egberink, Damen manager BWT, told *Tanker Operator* that the Trojan Marinex, and Evoqua BWTS were particularly suited for the tanker sector. He also said that in the past few months, Damen had received more enquiries.

"Some regional operators will wait until it is clear whether they will be able to receive route exemptions, or not. Many may also wait for USCG type approved systems to be available. In the end most will wait for as long as possible before retrofitting. The big rush will start after full ratification," he said. "Our main focus is on providing a global total retrofit solution. But we can also sell our partners systems to newbuilding projects."

"There is a need to co-ordinate and ensure cost effective implementation and life cycle support. With the large number of vessels to be retrofitted, there will be subsequent supply problems for BWT equipment, engineering and class in a booming market. By working with the selected BWM partners we will be able to offer a total cost effective package in a co-ordinated timely way.

"We need to ensure installation is done right first time as the vessels need to be compliant when they leave the dock. This can only be done in close partnerships and by standardising and specialising as much as possible. With the current selection of partners we can cover a very broad range of vessel types and customer. At this moment we expect we will not have to add any more OEMS, " he said.

For servicing, Damen has set up a one-stop-shop approach. "We offer a cost-effective total BWT solution; system selection, survey & 3D scanning, engineering, procurement, installation, commissioning and training. Our services do not stop after installation. We can provide training, system maintenance and deliver spare parts for the retrofitted BWTS," Oude Egberink explained.

Danish-based **DESMI Ocean Guard**'s patented RayClean system recently received IMO and DNV GL type approval.

At the beginning of September, DNV GL issued a type approval certificate, which included approval according to both the IMO BWMC and the DNV programme.

This type approval was claimed to be unique, as it was the first time a BWTS has been tested fully according to both IMO and US Coast Guard requirements. This was revealed on the certificate where it is stated that the RayClean system has undergone 15 land-based tests, five in each salinity, plus five shipboard tests as per USCG test requirements.

The IMO approval process requires 10 land-based tests in two salinities and three shipboard tests. However, RayClean underwent additional testing in order to comply with the USCG test requirements.

During land-based testing, a so-called

'operation & maintenance' test with the treatment of 10,000 tonnes of ballast water was performed and the electrical equipment in the system was put through significantly more demanding vibration tests than required by IMO.

This, combined with the fact that only USCG approved independent laboratory and test facilities were used throughout the testing programme, puts RayClean in pole position for the USCG type approval, which no system has been awarded yet, the company claimed.

"When we started the development and approval of the RayClean system three years ago, it was clear to us that not only should the system be approved to work in all salinity regimes, we also wanted a system that would be able to treat water in compliance with the IMO and USCG discharge requirements everywhere in the world. And this is where the UV- transmission limitation comes into the picture," explained Rasmus Folsø, DESMI Ocean Guard CEO..

Talking to *Tanker Operator*, Folsø said that the RayClean was ideally suited to the tanker sector. He also commented that he didn't think the recent IMO announcement regarding the G8 revision would kick-start an ordering spree.

However, the ratification of the convention is now a lot closer and that will probably make more shipowners prepared to start installing systems. "Especially because everyone knows that when the convention has been ratified, the demand will increase dramatically and that will also impact delivery times and prices. Now is the right time to plan and prepare, obtain good prices and ensure delivery of the systems you prefer," he stressed.

Engineering

Turning to the question of engineering and installation, Folsø said that the company can undertake some of this in-house, but DESMI planned to work extensively with third parties.

With over 50 systems on the market and type approved, he thought that the market is oversubscribed, "There are only a few quality systems on the market, which will be able to get USCG type approval without serious operational limits being imposed, such as sea temperature, salinity or UV transmission of the water," he warned.

A few years ago, **Goltens Green Technologies** set up a range of services for owners looking to install BWTS. These range from an initial consultation on the compatibility of short listed systems for a given vessel to a full turnkey design and installation of a chosen system.

Goltens has worked with many of the OEMs, including **Optimarin, Bio-UV, RWO CleanBallast, Headway Ocean Guard, Severn Trent De Nora BalPure, Alfa Laval, Auramarine Crystal Ballast, NKO3, Hyde Guardian** and others.

Jurrien Baretta, Goltens Green Technologies business development manager explained that the company does not have an official tie-up with any OEMs, but will work with all of them, as the company felt it was important to remain independent.

Similar to other service providers and OEMs opinions, Goltens said that owners are tending to wait for USCG type approvals before committing themselves to ordering systems. Baretta said that the company expected the bottleneck to occur around 2018, as owners will have until the first drydocking schedule to fit a system after the convention enters into force.

DESMI Ocean Guard's Rayclean is ideally suited for the tanker sector.

Baretta also said that the company has had most experience with UV type systems but can also handle EC, or other types. "We have installed two NKO3 systems on large tankers recently," she told *Tanker Operator*.

She explained that Goltens' strength lay in the retrofit market as shipyards will integrate BWTS into a newbuilding design from scratch. The company will also sign long term service agreements with shipowners, sometimes in conjunction with OEM's. "This will allow us to offer a very sharp price since we will get some work load 'horizon' in return. We offer especially interesting package deals for 2015, as this seems to be a rather slow year," she explained. "A calm before the storm."

Hyde Marine, a wholly owned subsidiary of Calgon Carbon Corp has signed a Memorandum of Understanding (MOU) with Singapore-based Keppel Shipyard and SEAQUEST Marine Systems for installation of the chemical free patented Hyde GUARDIAN Gold BWTS in international markets.

Under the MOU, Keppel Shipyard will carry out retrofit installations of Hyde GUARDIAN Gold's BWTS at its Singapore shipyard. Such a partnership will position Hyde Marine for the anticipated increase in the Asian retrofit market, the company said.

"Keppel Shipyard's marine expertise enables Hyde Marine to expand its commitment and focus on providing shipowners with one of the maritime industry's leading ballast water treatment technologies," said John Platz, president, Hyde Marine "Keppel Shipyard, through our agent, SEAQUEST Marine Systems, will help us enhance our ability to install Hyde GUARDIAN Gold BWTS promptly and safely, particularly for retrofit applications and in response to the growing number of shipowners seeking compliance with future regulations."

Hyde GUARDIAN Gold BWTS is claimed to be ideal for retrofits, as it is of a compact size required by a growing number of shipowners and operators, while maintaining the robust construction and technological specifications necessary to meet stringent regulations.

In 2013, Keppel became the first Singapore shipyard to undertake a BWTS retrofit project for a VLCC.

Engineering tie-up

Aiming at the lower to middle end of the market- ie vessels of up to 60,000 dwt/3,000 cu m per hour capacity - **Optimarin** has signed an exclusive partnership with Zeppelin Power Systems for the engineering, supply and after sales service of its Optimarin Ballast System (OBS) technology.

Zeppelin, a provider of drive, propulsion, traction and energy systems, will now become the exclusive dealer of the OBS in Germany, Poland, Russia and all CIS countries, with the exception of Ukraine.

"Ratification is approaching and this will lead to a surge in demand from shipowners looking for flexible, reliable and efficient systems that are simple to install and maintain,"said Optimarin CEO Tore Andersen. "Zeppelin is renowned in the marketplace for providing first class engineering, on time deliveries and comprehensive worldwide after sales service. In that respect they're the perfect partner for serving this crucial market; ensuring that shipowners get Optimarin systems and ensure complete compliance, and reliable operation, for their fleets."

Over 300 system orders have been placed and 180 systems have been installed worldwide in the 80-2,000 cu m per hour capacity range. The OBS utilises filtration and high doses of UV irradiation to inactive marine organisms. It has no moving parts and fewer components than competing technology – and, due to its modular design, is claimed to be easy to retrofit.

In addition it is IMO and USCG AMS approved, with certification through DNV GL, BV, RMRS and CCS.

Zeppelin offers a complete service for shipowners and yards, from the planning, engineering and the customisation of Optimarin's solution, through to the delivery of turnkey solutions and after sales service. All work will be carried out at Zeppelin's engineering facilities in Achim, Germany.

Andersen told *Tanker Operator* that an explosion-proof BWTS version is now being marketed. He said that he saw tremendous potential in the chemical/product tanker sector. He also said that he is continuously evaluating the market for new tie-ups, but none had been signed by the time this issue went to press.

He saw the retrofit peak occurring between 2016 and 2018, but the company had noticed an increase in requests for frame agreements and retrofits during the past few months.

Andersen said; "What I think is important is that the test regime for USCG is much more challenging and we will most probably see many systems that will fail during testing, especially on fresh water. This means that it can take a year before we see the first type approved USCG system and the process can be dragged out if the IMO ratification is not coming very soon."

He said that one of the main problems was the clogging of filters and advised the adoption of 'best management practice' when dealing with BWTS. He also warned that any system not being regularly used would have to be replaced, due to corrosion and other problems. Finally, he said that due to having two suppliers, he was confident that Optimarin could cope with the market upsurge when it occurs.

Major order

Severn Trent De Nora has received an order for its patented BALPURE ballast water management system from STX Offshore & Shipbuilding.

Fourteen IMO type approved and USCG AMS certified BALPURE systems will be installed on crude oil tankers being constructed for BP Shipping by STX in Busan, South Korea.

The order includes 10 BALPURE BP 3000 systems, each with treatment capacities of 3,000 cu m per hour, which will be installed in the 110,000 dwt Aframax newbuildings, and four 4,000 cu m per hour BALPURE BP 4000 systems, which will be installed on the 160,000 dwt Suezmaxes.

The units will be delivered to the STX shipyard for installation between February 2015 and March 2016 and will be managed and delivered from the company's Shanghai hub.

In addition to being IMO type approved and USCG AMS certified, BALPURE has been Bureau Veritas type approved and ABS design assessed.

Another major order for fitting BWTS on board tankers was received by **Trojan Marinex** recently. This involves the fitting of

Trojan's Jim Cosman.

BWTS on Laurin Maritime's 11 tankers.

"Laurin Maritime and Trojan Marinex is an outstanding partnership," said Dr Christian Williamson, vice president, Trojan Technologies. "From global regulatory compliance to treating varying waters of poor quality, Laurin Martime's requirements are directly aligned with our goal of giving customers the confidence that their business of transport goes uninterrupted."

"Our vessels sail in waters in the US and we are convinced that the Trojan Marinex system offers Laurin Maritime the ability to meet emerging regulatory requirements, especially requirements for USCG type approval," explained Capt Pär Brandholm, environmental & nautical manager, Laurin Maritime. "We were impressed with the amount of testing that has been conducted and Trojan's overall approach to develop a system specifically to meet the US requirements.

"Our vessels often visit river ports and the fact that they tested in all water qualities, specifically freshwater and in very poor water qualities were very critical factors in our decision-making process. In addition, not only is their system available as a single integrated unit for high flow rates, it also has explosion-proof certification which was a requirement for our vessels," he said.

According to Trojan's Jim Cosman, Laurin Maritime selected the Trojan Marinex BWT 1000 systems to be installed on each vessel. These systems are designed to treat 1,000 cu m per hour. "Our product suite includes seven systems that are able to treat any flow rate throughout all water qualities. An explosion-proof version of each system is available for vessels where installation in a potentially explosive environment is required," he explained. .

He claimed that Trojan Marinex BWT systems are ideal for tankers for two primary reasons:

1) Explosion-proof certification.
2) Available in high-flow configurations with a small footprint and reduced power compared to traditional UV systems.

Explaining the tie-up with Damen, Cosman said that Damen's strategy is to offer a one-stop shop for ballast water retrofits. They will have access to the entire Trojan Marinex BWT product suite. They will also offer for newbuilds and have already won orders to fit offshore supply vessels with a Marinex system.

Cosman also said: "We have definitely notice an increase in interest throughout the past six months. We attribute it to the enactment of the USCG regulations for some size classes of vessels at the first of the year. The Convention inching closer to ratification is also a factor. The prospect that the Convention will be ratified in 2015 is very real and vessel owners are beginning to make firm plans and conduct serious system evaluations."

USCG AMS acceptance was also recently granted to **Wärtsilä**'s Aquarius EC BWMS. Wärtsilä anticipates having all activities necessary to gain full US type approval completed within the five year interim period, the company claimed.

"With global BWMS regulations now imminent, shipowners must evaluate as a matter of some urgency the ballast water treatment technology best suited to their existing and future vessels. Our technical leadership in this field allows us to provide strong support to our customers in meeting their environmental compliance obligations," said Dr Joe Thomas, Ballast Water Treatment Director, Wärtsilä Ship Power.

Other companies to receive USCG AMS recently include UK-based **Cathelco**."This is an important milestone in achieving full US Coastguard type approval. It means that vessels fitted with our system can go anywhere in the world without restriction," said Peter Smith, Cathelco sales director.

The Cathelco system received IMO type approval earlier this year and is based on a combination of filtration and UV technology.

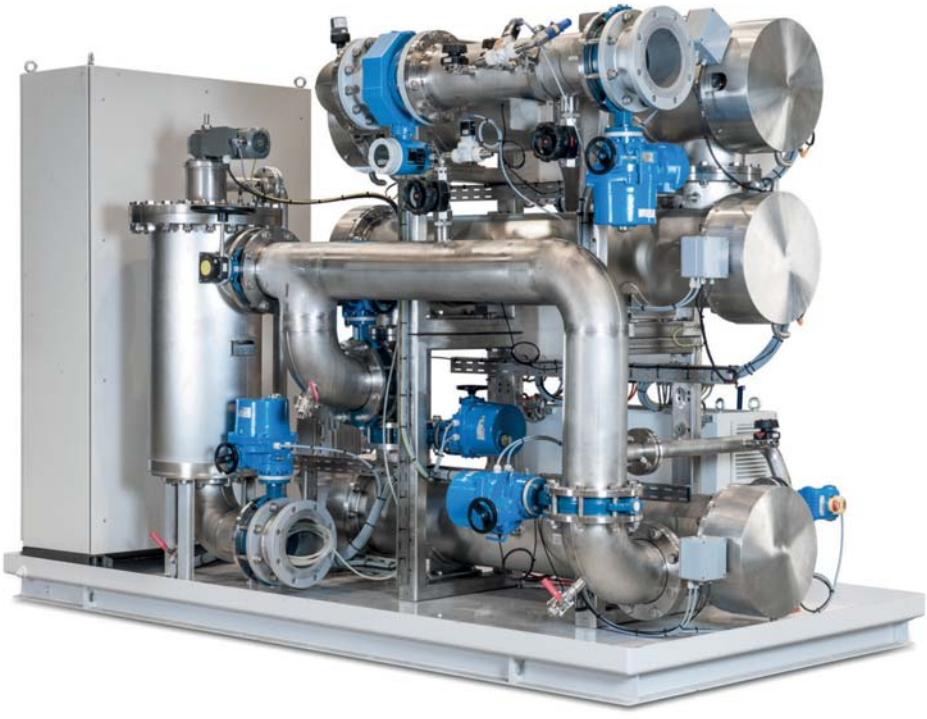
The AMS approval recognises that the system will continue to disinfect heavily silted seawater where UV light transmittance values are as low as 45% (75% being the value for normal seawater) at 190 Joules per sq m.

IMO Type Approval for the system was attained in April from BSH and the German flag administration. It was preceded by land based testing at the NIOZ facility in Holland and shipboard testing on a ro-ro vessel.

Cathelco BWT units are available with capacities from 34 - 2,400 cu m per hour. In order to maintain its effectiveness, the system automatically adjusts to different sea water qualities.

Just prior to SMM, **GEA Westfalia Separator** Group was awarded IMO type approval by BSH for its BallastMaster ultraV 500.

The 500 cu m installation is a scale-up of the 250 cu m variant, which was certified with the IMO type approval in December 2011.



GEA Westfalia was awarded IMO approval for its BallastMaster utraV 500 system.

Does shipping view emission control impossible?

To design what it perceived as a better system to control diesel engine emissions, UK-based Hydrox Solutions turned to hydrogen.*

Hydrox became convinced that the early approved technology, which was being tested by the shipping industry, was on the one hand costly, cumbersome and inefficient and on the other had room for development if the right technology was available.

As a result, the company has developed technology to reduce particulate matter (PM) emissions.

The methods used for particulate reduction in the shipping industry have, for a number of years, focused on costly dual fuel systems and exhaust scrubbing.

Exhaust scrubbing can be effective but only if the apparatus is in very close proximity to the engine exhaust outlet where gas temperatures are at a maximum. Once the exhaust gas has lost its initial high temperature from the combustion chamber, scrubbing, or filtering, methods become less effective.

The problem is that in real time operational conditions, it is impossible to measure levels of pollution and particulate reduction.

In laboratory conditions, with the apparatus close to the engine, good percentages of particulate reduction can be observed. However, scrubbing apparatus is typically installed at some considerable distance from the engine. It then becomes debatable whether the scrubber has any effect at all.

New vessels can be designed around this problem, although the actual scrubbing apparatus is of considerable size, which also makes retrofitting impractical.

What we have developed is a programmable computerised system that deals with particulate emission reduction and can be incorporated, or retrofitted, to improve the effects of filtering and scrubbing of the exhaust. That is to say, we are enhancing the quality of the fuel causing combustion to be more complete, hence burning the particulates in the combustion chamber.

To do this we have engineered the means to control hydrogen on demand.

It has been recognised for years that the introduction of hydrogen into the combustion chamber of any internal combustion engine has a beneficial effect. Unfortunately, hydrogen systems have attracted bad publicity in the past due to false and exaggerated claims, but it is well known and widely accepted that the basic technology is sound however, control has always been the sticking point.

All engine types

The effectiveness of our system is neither governed by the distance it is installed from the engine, nor by its size. The unit can be easily scaled and retrofitted to any engine. Through controlled and fully documented independent tests conducted at the UK government approved facility at Millbrook, our system has reduced carcinogenic particulate emissions from an already efficient euro 5 diesel engine by an additional 22%.

Further developing this system, alongside the work currently being undertaken by engineers and maintenance operatives in the shipping industry, is the next step. We know the benefits of doing so will be huge and we are currently looking for like-minded organisations to make this happen.

So arguably the problem we now face is how to encourage the shipping industry to take the huge moral and ethical step to reduce the levels of pollution being released into the atmosphere.

Tough new pollution control regulations coming in next year, set to reduce emissions, are already deemed to be unfair in some quarters with talk about the difficulty in enforcing these rules, possible corner cutting by some ship operators, rising fuel costs and job losses.

But inevitably, the control of emissions is here to stay and cannot be ignored, which is why we have invested years in developing a cost effective, reliable solution.

**This article was written by Roger Saunders, director Hydox Solutions.*

Hydrox Solutions' Roger Saunders.

DNV GL's ECO Insight explained

Following the launch of DNV GL's vessel performance management tool - ECO Insight (see October issue, page 32), Dubai-based Nikeel Idnani*, business development leader, DNV GL Maritime Advisory, has produced a paper describing the tool.

Each vessel has to compete in the charter market, in which fuel efficient vessels now have a distinct advantage. It is therefore vital to have an insight into the vessel's performance and compare similar vessels in order to improve efficiency and competitiveness.

Consequently, ship performance management is becoming business critical. In addition, soaring fuel costs and new regulations compel ship operators to adopt a structured approach to energy management.

Ship operators face the challenge of not knowing exactly how their fleets perform. They are troubled with questions such as - Where can I find further potential for improvement? Can I trust the quality of the data collected? Is data aggregated effectively and presented in a way that enables sound analysis of ship operation to support the right management decisions?

In frequent conversations with ship operators, DNV GL discovered a lack of a practical method for gathering, sorting and presenting ship operation data.

There are two basic approaches to holistic ship performance supervision.

1) A fully automated system, which may be convenient but requires considerable CAPEX and is often technically challenging to install & maintain.
2) A professional data collection and reporting software product requiring manual data entry and therefore an affordable solution with inbuilt correction and plausibility checks.

Operators of smaller and medium-sized fleets may not have the infrastructure, or the wherewithal for a customised hardware and software solution. Staff constraints to consolidate and analyse information can also be a stumbling block.

Currently, diverse operational data is collected on board ships, including reports and live data recorded by systems. This data is then sent ashore with only superficial analysis. Only in cases of obvious inconsistencies are detailed analyses performed, often too late to take remedial action.

Fuel efficient vessels have an advantage when competing in the charter market.

With minor modifications to this process, DNV GL's ECO Insight enables continuous fleet performance management, allowing transparency of ship operations and identifying significant fuel-saving measures. You can after all, only manage what you measure.

ECO Insight covers all main ship performance areas and is applicable for all ship types. Data is collected in an on board tool and transmitted ashore to be formatted in a structured database. Thereafter - EEOI, speed, DP performance, fuel oil consumption, effect of weather and performance of auxiliary systems can easily be analysed to optimise the overall vessel performance.

All relevant vessel performance parameters are displayed on comprehensive dashboards, available at all times on a web-based portal. This allows technical personnel and management to conveniently view and evaluate relevant data and KPIs. Graphs give a quick insight into actual vessel performance and allow for fleet benchmarking.

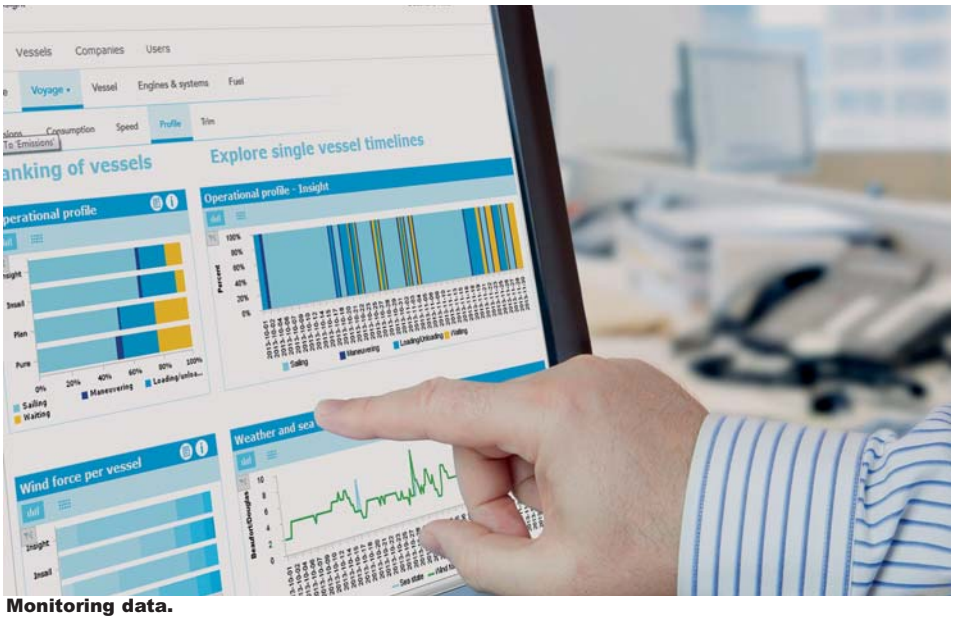
The system also offers analysis of trim, hull and propeller efficiency based on a CFD generated detailed ship-specific model. The hull and propeller are significant parts, which affect a ship's fuel consumption.

Advice and comments given in the ECO Insight by DNV GL experts highlight performance-relevant areas and benchmark the performance with similar ships, which acts as a decision support system.

ECO Insight has superior capabilities in holistic ship performance management, including tracking the compliance of environmental regulations, internal & external benchmarking and evaluation of KPIs, thus giving it a competitive edge.

Once reliable data about the vessel, each voyage, as well as engine and system performance, has been collected in one central location, ECO Insight can be used to aggregate and display the data and perform data analytics. This provides the operator with easy access to comprehensive fleet performance information, which may be sorted and used to compare similar vessels.

The data can be grouped by any category, and various timelines, or operational modes,



Monitoring data.

may be investigated. An owner may draw conclusions about fleet performance based on user-defined KPIs, or use the benchmarking capability to display anonymous performance data provided by other users of the portal in comparable vessel categories for market-wide evaluation.

Ease of installation

Installation of the solution is straightforward both on board and as a web-based solution in the office.

The installation is effortless, non-intrusive and makes crew training superfluous. There is no dedicated hardware and the stand-alone, cost effective solution is suitable for even chartered-in ships, which enables an overview of the entire fleet. Thus, the ship operator can identify the performance of chartered ships enabling better future selection of vessels.

Subscribers to the ECO Insight can assign user rights with hierarchy. The system is flexible and easy to adapt to any fleet size with a user-friendly layout of the performance dashboards.

With online service, subscribers have access to a holistic view of fleet operation data on the ECO Insight portal 24/7. Should a client require further support for drill-down, root cause analysis, DNV GL's technical staff can assist with tailored expert advice for decision support.

There are several filter options available, including selecting specific ships, a time period, operational modes, or the weather, for bespoke analysis. Chartered-in ships can be added to, or removed from the portal with ease.

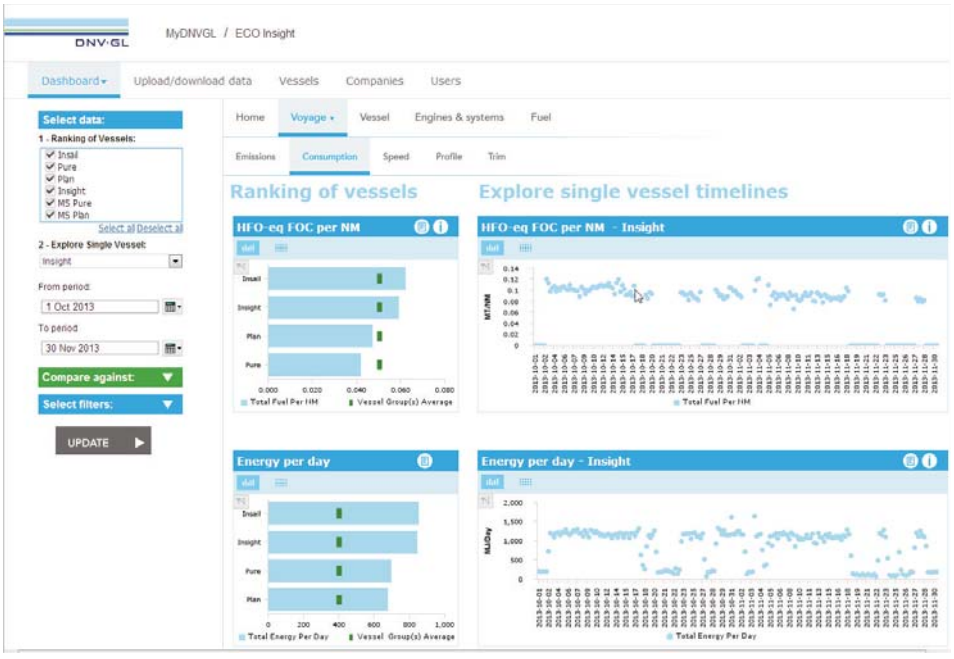
Two types of benchmarking are possible.

A) Intra fleet benchmarking

B) Industry benchmarking against similar vessel type peer groups made possible by integrating AIS and vessel data of the global fleet into the ECO Insight platform.

To provide a feasible solution to customers, DNV GL combined its ship-to-shore reporting software - Navigator Insight - with the web-based performance management portal. ECO Insight is also capable of accepting data from existing systems. Together, these applications allow ship operators to access the collated information presented on user interface via pre-defined dashboards for further analysis.

With inbuilt plausibility checks to reduced recording errors and to yield the best data quality, 80 vessels have installed ECO Insight to optimise ship performance based on the analysis of operational data.



DNV GL dashboard.

The future

Commensurate with DNV GL's performance and conformance quality, the key to the system's competitive success lies in adding valued services, such as - continuously upgrading the product with appropriate new features.

DNV GL will continue to develop this solution, eventually connecting additional data sources to the ECO Insight portal to deliver comprehensive insights across an evolving range of parameters.

One example is the combined input of AIS, vessel specific & weather data enabling the realistic performance benchmarking of a particular ship with similar type & size of ships in the worldwide fleet.

Similarly, all subscribers to the portal will have the facility to benchmark the performance of their particular ship with other ships within the exclusive ECO Insight community fleet, anonymously.

DNV GL currently devotes 5% of revenues (NOK15.234 bill in 2013) to fund contemporary R&D projects. ECO Insight was the result of one such undertaking. TO

**Nikeel Idnani {MBA, Class 1 (Motor)} served for 10 years on board ships , rising to Chief Engineer, prior to settling in Dubai where he is currently resides. From 2003 to 2011, he was employed in various sales, service & marketing roles in the ship design, shiprepair & building, plus sales/service of equipment manufactured by an international OEM.*

In his present function, he promotes DNV GL Maritime Advisory's consultancy and advanced marine engineering services, with a focus on enhancing ship energy efficiency, both in design and operation.

Understanding Resolution MEPC 227(64)

On 1st January, 2016, Resolution MEPC 227(64), adopted by the IMO's MEPC 64 meeting in October 2012, will enter into force.

This is the revised guidelines on the implementation of effluent standards and performance tests for on board sewage treatment. The new regulation could make existing treatment plants incompatible and non-compliant with the new rule, should they fail to pass new type approval processes.

MEPC 227(64) effectively changes the discharge requirements and test protocols adopted by MEPC 159(55) in 2006, with the specific aim of reducing nitrogen and phosphorous from the treated water, preventing the acceleration of nitrification of the seas.

The revision prohibits black (sewage) water discharge into the Baltic Sea special area, with the exception of vessels equipped with a type-approved waste water treatment system that meets effluent discharge requirements of less that 10 mg/l of nitrogen and less than 1 mg/l of phosphorous.

Currently, the Baltic is the only IMO designated special area, but more areas are known to be applying for similar recognition.

According to a survey carried out in 2012, one IMO member state found that a significant number of treatment systems did not meet the existing standards, due to improper use of detergent, a lack of maintenance, or simply because operators failed to follow the plant manufacturer's operating instructions.

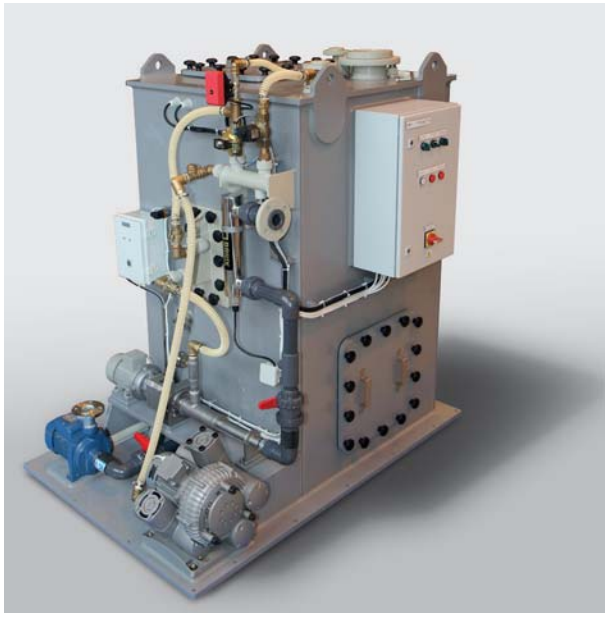
It was also said that few ships' waste water treatment plants satisfied the less stringent demands of the rules adopted in MEPC2 (in 1976), notwithstanding those rubber stamped at MEPC55 and MEPC64 in 2012.

The new guidelines, with the exception of the requirements in section 4.2, will apply to sewage treatment plants installed on, or after 1st January, 2016 on all ships in all areas.

It states that an approved sewage treatment plant should not rely solely on dilution of waste water. And while amounts of dilution are deemed essential to a treatment process, effluent standards have to meet more stringent criteria.

Differing viewpoint

However, Mark Beavis, managing director of waste water treatment systems specialist ACO Marine, had a different view: "Lots of technologies use dilution, but dilution is not a solution to pollution; it is not treating it, it is reshaping it; we can treat it and remove the pollutants," he said, referring to the development of the company's new patented ACO Bio Sword technology, which is at the core of ACO Marine's Clarimar MF and Maripur NF waste water treatment units.



ACO Marine's Clarimar MF.

Both the new treatment plants incorporate patented ACO-MF filtration technology removing the requirement for settling and chlorination stages. Disinfection of the treated effluent is in-line ultra violet lamp and there is no requirement for chemicals in any part of the treatment process. Furthermore, the units are completely unaffected by ship movement, or vibration.

The treated water can be re-used as technical fresh water for toilet flushing, deck washing, or laundry applications. Alternatively, it can be legally discharged overboard.

Beavis, said: "The ACO Clarimar MF has been designed as a cost-effective, robust waste water treatment solution for the commercial marine market, including all types of cargo, offshore and specialist vessels.

"By combining these two unique technologies we have been able to remove the settling and chlorination stages found in more traditional biological waste water treatment systems. Disinfection of the treated effluent is by in-line mounted UV lamp with no requirement for chemicals in any part of the ACO MF process.

"The use of the new Bio-Sword has enabled us to reduce the volume of the activation chamber and overall footprint of the system without impacting the capacity and performance of the unit. It is completely unaffected by ship movement and vibration and requires little maintenance. The only consumable is the filtration sock, which needs changing about every three months," he concluded.

Fully type-approved by Bureau Veritas to meet MEPC 227(64) and EC MED module B, it is a plug and play system with a capacity range to treat up to 37,800 litres of ship generated waste water per day.

TO

Increasing shipboard electrical power from waste heat recovery

US-based Calnetix Technologies has introduced a new system that will produce up to 125 kW of power for the ship's electric load from heat recovered from an engine's jacket water.

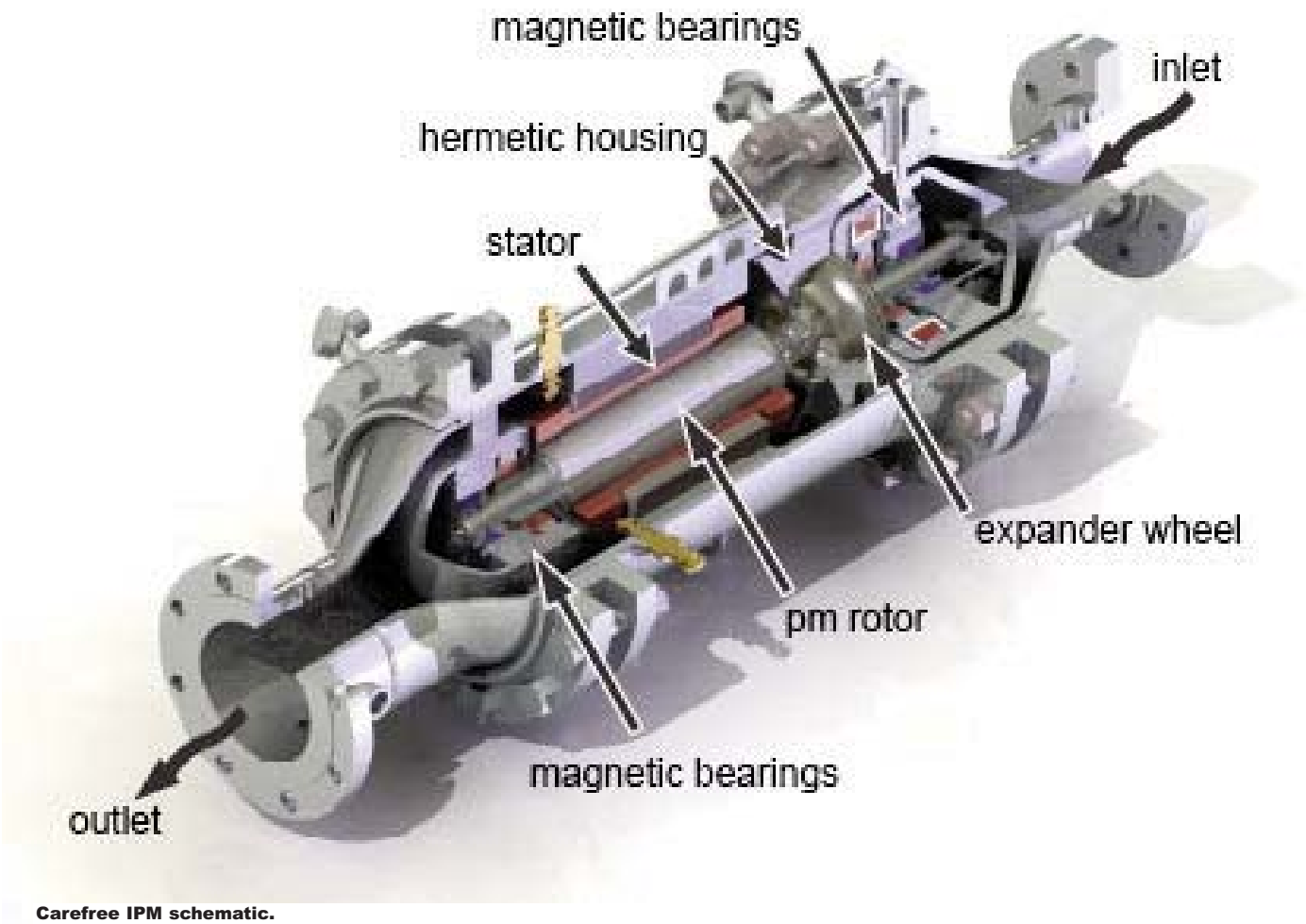
The patented Hydrocurrent system was developed by Calnetix in conjunction with Mitsubishi Heavy Industries Marine Machinery and Engine Company (MHI-MME).

"Hydrocurrent pays for itself in a very short time by reducing the load on the ship's bunker-fuelled generators," said Vatche Artinian, Calnetix chairman and CEO. "This can translate into fuel savings of up to 200 tonnes per year."

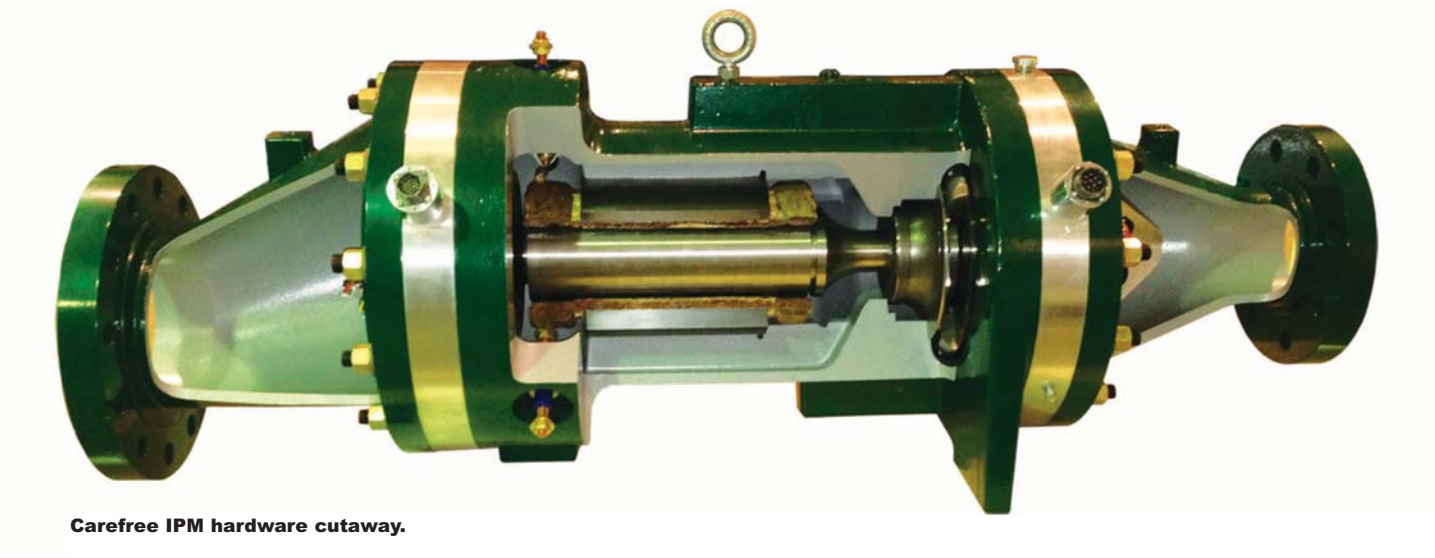
These savings amount to a good payback time, the company claimed, stating that the aim was to give an ROI of two years.

Calnetix' waste-heat recovery technology uses an organic rankine cycle (ORC) heat recovery process with Calnetix's patented Thermapower and Carefree integrated power module (IPM), which converts thermal energy into mechanical power. It is claimed to be unique in that it can pull usable heat from a source with temperatures as low as 80 deg C unlike other heat recovery systems that require much higher temperatures.

The system converts excess waste heat into electric power without affecting engine performance, while still leaving sufficient heat



Carefree IPM schematic.



Carefree IPM hardware cutaway.

in the jacket water for the fresh water maker.

Hydrocurrent's ORC module is a closed-cycle evaporator-condenser phase-change loop, using an organic fluid that has a very low boiling point. The fluid is pumped through an evaporator that pulls heat from the engine's jacket water. The superheated vapour is expanded across the Carefree module, producing electric power, which is connected to the ship's grid. The warm vapour then flows into a seawater-cooled condenser where it turns back into liquid form.

Carefree IPM consists of a high-speed turbine expander and high-efficiency permanent-magnet generator in a single hermetically sealed housing. The friction-free magnetic bearings require no lubrication, or maintenance.

Small footprint

The Hydrocurrent system has a small footprint and can be retrofitted easily in existing ships without making any major modifications to the engines. It is designed specifically for the shipboard environment, requires very little maintenance and is designed to last for 20 years. Operator assistance is minimal; the system turns on and off automatically based on the heat source temperature, the company claimed.

It has been designed and built to ClassNK and Lloyd's Register guidelines and was due to be tested in October/November this year with the first shipboard trials taking place early next year. Once in production in California, Calnetix will sell the system to OEMs as a package, the company explained.

Calnetix has been working closely with MHI-MME since 2005 to develop technologies to improve ships' energy efficiency without impacting vessel operation, or performance through highly efficient and cost-effective pressure and heat recovery systems.

Existing MHI-MME products with integrated Calnetix technologies include the MET hybrid turbocharger and the electric assist MET turbocharger. Calnetix said that it will be adapting the Hydrocurrent technology for marine engine exhaust and engine scavenge air heat recovery.

"The core technologies comprising the Hydrocurrent and Thermapower ORC modules have been used for heat recovery in various (land) applications in the US, Canada, Europe, the Middle East and Asia since 2009 under Calnetix and our distributors and licensees, including GE and Daiichi Jitsugyo," said Artinian. "Together with our partners, we have deployed over 35 MW of capacity in land-based installations."

Front view of Hydrocurrent.

Modular Smit LNG/LPG inert gas systems

LNG and LPG carrier tanks hold both a source of income and a potential source of danger, Alfa Laval claimed.

With increasing demand, tighter delivery schedules, the constant need to optimise on board footprints and numerous other factors, Alfa Laval said that it believed inert gas systems (IGS) should go beyond fire safety.

In anticipation of an increase in demand for LNG/LPG carriers, Alfa Laval has unveiled its next generation of the Smit IGS for both types of gas carriers.

Gas carriers require very dry inert gas, making an IGS installation the most complex. Today, Alfa Laval claimed to be the leading supplier for the low-pressure, low-dew-point inert gas generators typically used on gas carriers.

Smit's LNG/LPG IGS comes in modular form.

Modular construction

Alfa Laval Smit LNG/LPG systems are constructed in a new modular design, comprising four main components - generator, cooler, chiller and dryer units. This design allows tailored deliveries to shipyards to meet individual building design demands.

"With our modular system we have a configurable system, using only the components needed for each particular build," explained Herben Heesen, Alfa Laval's IGS manager marketing and sales. "In other words, you pay only for what you need. Plus, it makes delivery times quicker and installation easier. For example, the dryer can be delivered in two main components (barrels) for easy transport. Both main components are easy to set up in a complete system together.

"Saving space is also an obvious benefit of the modularity. On board, every centimetre makes a difference and the new modular Smit LNG/LPG system offers a considerably smaller footprint," he claimed.

By using water as an intermittent heat transfer medium between chiller and cooler, a stable heat transfer is created under all load conditions. The dryer unit is redundant and provides additional security. The cooler, which has gas contact surfaces of SUS 316 for lifetime service, takes up minimal space due to the low-temperature output of the generator.

The IGS is fitted with Alfa Laval's new 2Touch controller, which makes any aspect of the system available in just two touches of the screen. As well as offering a graphical overview of the system, it provides quick access to functions and data. Using the comprehensive data at its disposal, the touch control ensures thorough system optimisation. It also integrates with other Alfa Laval automation systems and easily connects to the ship's control and communication systems.

At the heart of the system is Alfa Laval's patented Ultramizing combustion system, assuring low-oxygen-level inert gas without any soot formation. Oil is atomised in an ultra-fine dispersion pattern with steam assist, resulting in reduced NOx output. The system utilises a highly efficient, two-stage oil/air mixing technique, which yields inert gas with 1% oxygen content possible and zero soot formation.

Horizontal installation also allows for easy maintenance, although this is seldom required, the company said.

Training can be conducted on board, or at customer-specified locations. In-house operator training is also available in Alfa Laval's facilities in the Netherlands. The company can also supply OEM spare parts and carry out inspections, service, repairs, retrofits and upgrades on all their IGS worldwide.

TO

Supplier consolidation leaves tanker operators stranded

The move by some US suppliers to consolidate manufacturing sites and withdraw slow-selling items from their product range is leaving customers high and dry, warned marine tank gauging specialist PSM.

With a significant number of end-users across the market relying on these firms, their move to reduce production in smaller European factories and relocate to low cost countries is having a serious impact on customer service, delivery and communication.

The problem has been further compounded by the decision to generate more savings by obsoleting older tank gauging products, due to the cost of maintaining hazardous area and marine type approvals.

Without these products, many users are being left without the ability to directly replace, or repair, failed hydrostatic level and pressure transmitters.

UK-based PSM said that it has increasingly been helping those let down by larger suppliers by offering new transmitters that are mechanically and electrically equivalent to the failed, or non-available, OEM items.

"Like all globalisation and offshoring concepts, the decision being made by many suppliers is a good cost saving idea in theory but works badly in practice due to quality, communication and skills problems," said Mark Jones, PSM sales director "For customers this translates to delivery issues and a lack of effective, personal, customer support."

TO

PSM's Mark Jones.

DRY DOCKING

DO YOU FEEL LIKE YOU'RE IN DEEP WATER?

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- TENDERING
- EVALUATION
- YARD ACCEPTANCE
- JOB REPORTS
- OWNERS REPORTING

Marine Project Manager is easy to use and all you need to keep it all under control.

Save time, stress and frustration by streamlining the process of planning and managing your next docking.

Don't sink under the strain of organising your next docking. Our intuitive software helps you plan and manage the job quickly, while keeping costs under control.

Forget about managing vessel dockings the traditional way using paper, Excel spreadsheets and Word templates. Marine Project Manager makes everything so much easier.

Developed for mariners by mariners, and built around superintendents' specific needs, it takes you through every step of the process – quickly pulling all the required information into one place.

Simplicity itself, Marine Project Manager is the easy, effective and affordable way to get everything you want out of your next docking.

It's all you need. So get it sorted.

To arrange a live one-to-one web demo and experience the simplicity of MPJ call **+44 (0) 1304 840009** or email **info@marinesoftware.co.uk**

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