

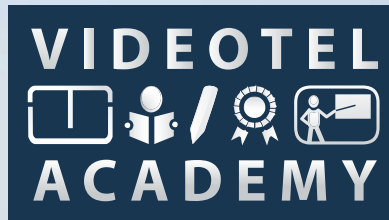
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How to cut costs effectively



Front cover

Chemical Tanker safety comes into sharp focus in a new training course from maritime training provider Videotel Marine International.

The recently-launched Advanced Chemical Tanker Course has been developed in conjunction with the Chemical Distribution Institute (CDI), with the involvement of some of the biggest names in the chemical tanker industry.

It is available online, is live-tutored and is MCA-accredited and is targeted specifically at Masters, Chief Officers, Chief Engineers, Second Engineers and other persons having immediate responsibility for loading, discharging and care in transit of cargo on bulk liquid chemical tankers, including shoreside operational personnel.

VLCCs – just a blip, or something more fundamental?

We make no apology for focusing on VLCCs for the first few pages of this issue, as the extent of the market rise in this sector has surprised most of us.

Gibson Shipbrokers commented that it is normal for a seasonal increase to take place around this time of year, on the back of rising oil demand and the up-coming holiday periods.

For example, the broker said that for each of the past three years, VLCC earnings on the benchmark TD3 AG-Japan route increased by \$13,000-\$18,000 per day between October and November.

On this basis, we could have expected earnings in November of around \$35,000 per day. Instead, with momentum and a strong psychological tailwind, earnings have averaged more than \$45,000 per day and at their peak, hit \$55,000 per day on 20th November.

Over the past three months, VLCC chartering in the AG has been constantly high at around 140 fixtures per month, something we haven't seen in this market since the end of 2011, Gibson said.

At the same time, there has been a continuous high level of VLCC business fixed out of the Atlantic Basin going East, with 44 reported fixtures in August, 45 in September, rising to about 56 in October.

This sustained high level of fixing from both areas has created the fundamental push needed to lift the market; the psychology has since held it there, even against the potential increase in vessel speeds.

Be warned here, as Frontline said in its third quarter 2013 results presentation that a three knot increase in a VLCCs ballast speed equates to around 12.5% of extra supply.

OPEC production looks set to be slightly lower next year and if this is the case, any cutbacks are usually centred on the Middle East region. Given this scenario, together with more Middle East refining capacity coming on stream in 2014, the drop in crude exports from the AG could be more severe.

The one unknown quantity - what will happen when Iran is accepted back into the fold, which seems highly likely?

If there are still some questions as to what will happen in the Middle East, the Atlantic Basin VLCC prospects seem clearer. The fact that VLCCs now regularly ballast to West Africa to pick up eastbound cargoes is clearly supporting the VLCC market and the need to do this has increased in recent times, Gibson said.

This rise in West Africa-East VLCC trade can be put down to the huge success in US fracking. The major increases in US oil production have been seen in very light crude and as a result, removed the US import requirement for light grades from West Africa, which was typically a Suezmax trade.

These crude volumes don't just disappear; they find a new home, which has mostly been the VLCC trade to Asia/Pacific.

This trend is forecast to continue next year and beyond resulting in even more VLCCs trading from the Atlantic going East.

However, Gibson warned that its base forecast is that next year the loss of AG VLCC cargoes will be greater than the gain in the Atlantic Basin. So, based on a further increase in VLCC supply, we would normally expect a weaker VLCC market in 2014. But, as mentioned, the one major uncertainty is still Iran.

As has been seen in the MR sector, on the back of a firming rates comes the ordering of new tonnage. Although there have been a few rumoured VLCC orders and newbuilding resale deals reported, we need to keep the lid on any ordering spree.

Again quoting Frontline, there were still 56 VLCC newbuildings to come as at the end of the third quarter of this year, amounting to 9% of the current fleet. We cannot point to the single hull phase out any more for salvation, as, according to Fearnleys, there is only one single hull VLCC left trading.

Another of John Fredriksen's vehicles, Ship Finance took the market by surprise by announcing the scrapping of two 1998 and 1999-built VLCCs. However, this decision was not market based, as the company did not want to spend the money putting the vessels through their forthcoming special surveys.

Conversion candidates

Normally, large tankers built in the 1990s/early 2000s would find a home as FPSO, or FSO, conversions, of which there are still undoubtedly more to come and not just for the Brazilian market.

Older VLCCs are not easy to upgrade without spending a lot of money on them and doubts have been expressed by Euronav for instance on the merits of Eco-VLCCs. It is almost impossible to radically change a large tanker's hull shape and so improved operational efficiency is the key to saving money here (see page 8).

If the current charter rate hike continues, there is no doubt that private equity firms will also be seen entering the market, as indeed, they have in the MR sector.

It will be interesting to see if 'Peter G' and his GenMar team do finally get their hands on Maersk's 15 VLCCs, having hauled themselves out of near bankruptcy just recently.

Are there more potential VLCC movers and shakers out there ready to pounce?

TO

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VLCCs see a touch of *deja vu*

During the second half of this year, we received a new lesson in shipping market volatility, plus a positive expectation change, at least on the surface.*

First, late in the summer, the Capesize market saw its freight rates skyrocket from below \$10,000 per day to above \$40,000 per day with no fundamental changes in market dynamics. However, by the end of November, rates had settled at about \$15,000 per day.

Second a couple of months later saw the most volatile of the crude tanker markets – VLCCs – have their ‘Cape moment’.

VLCCs have been having a terrible run ever since the US shale oil developments with average earnings ranging around \$15,000 per day since 2011. The first half of this year had been exceptionally bad with average earnings below \$13,000 per day and several examples of fixtures only paying for bunkers.

However, by the end of November, average VLCC earnings had moved above \$50,000 per day. There were no fundamental changes in market dynamics and the recent spike was mostly attributable to transitory factors, such as much of the world fleet being out of position. The consensus of opinion was that the market would fall once these positions had been covered.

Besides the tangible freight rate improvement in VLCCs, there has also been the intangible impact of ‘resetting’ the trade’s forecasting model. For example, shale oil meant declining US crude oil imports with its adverse impact on the crude tanker market, namely VLCCs (MEG- USGC/LOOP) and Suezmaxes (WAF to Philadelphia).

However, lower US crude oil imports implies higher exports from oil producing countries to other buyers located further away from production, namely India and China, which could be a positive development for VLCC fleet utilisation and tonne/mile growth.

Shipping South American and West Africa oil to Asia instead of to the US is more advantageously time consuming for the vessels. They can now ship westbound cargoes from the Persian Gulf to USGC, ballast to South America, or WAF and load for Asia discharge. Here, the laden-to-ballast ratio and the economics become much more favourable.

This new method of thinking is helping to renew interest in VLCCs, but there are still a few unknowns, ie Chinese buyers openly preferring Chinese owned and controlled tankers for their imports.

The change in market momentum is easily reflected in both market activity and asset pricing. While fewer than 20 VLCCs changed hands in either 2011 or 2012, thus far in 2013, 28 vessels have been sold.

Until recently, most of the sales concluded were elderly tonnage built in the 1990’s with the most recent sale of a modern vessel taking place in January 2012 (*Electra Glory* built in 2009 at Daewoo, sold to Sinokor for \$79 mill). However, 10 of the 28 VLCCs sold this year are under five years old and only three were built prior to 2000.

Modern tonnage preferred

There has been a definite buyer preference for modern tonnage, as has always been the case, but it seems that only recently have they managed to tempt the sellers with offers around cost basis.

Navios and Sinokor have been the most active on the VLCC acquisition front recently, with the former acquiring four modern vessels and paying \$83 mill for the 2012 Daewoo-built *Blue Opal*, while the latter focused on around 10-year old tonnage.

It also has been reported that the Marinakis Group of Greece outdid serious competition to secure, at just below \$90 mill, a 2014-delivery newbuilding from SWS-*Shanghai Spirit*.

At the same time, while only two VLCCs were ordered in 2011, 15 in 2012, and 18 year-to-date this year, mostly from strategic players, in the third week of November 2013 alone, an additional 15 vessels were rumoured to have been ordered by the Scorpio Group, Navig8, and DHT Tankers, at contract prices of more than \$90 mill per vessel, on the back of the recently revived capital markets.

On the demolition front, 20 VLCCs were scrapped in 2011 and 2012 and 16 thus far in 2013. There is an increasing trend of vessels being scrapped just before their 20th



***Article contributor- Basil Karatzas.**

anniversary and recently even before their 15th birthday (3rd Special Survey), illustrated by Fredriksen-controlled companies selling the 1998-built *Front Champion* and the 1999-built *Golden Victory* to the breakers.

Looking forward, while 62 VLCCs were delivered in 2011, 48 in 2012 and 32 in 2013, the orderbook still stands at about 14% of the world fleet of about 650 vessels. Some 40% of the world fleet is newer than five years and 63% newer than 10 years of age.

While the recent developments in the VLCC freight market are welcome, one wonders whether the present developments are a story where ‘the tail wags the dog’ with other people’s money (OPM) rush for orders in ‘out of favour’ sectors just to appeal to investors while prolonging the market recovery.

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Business solutions to aid the tanker sector

FleetWeather Ocean Services has introduced what it claims is the first business intelligence solution for the global commercial shipping industry.

The company said that it had recognised that business intelligence tools, analytic services and big data concepts, common in most industries today and especially in the worldwide financial markets, were not available to global shipping leaders.

Working closely with its clients over several years, FleetWeather has engineered and developed unique, customised performance and analytic services designed specifically for shipping companies of all sizes and types.

FleetWeather's services combine the latest technology with a team of analysts and industry experts responsible for managing and overseeing their client's solutions from end-to-end on a daily basis.

The analysts can absorb and manage the entire back office data operations for a shipping client while also providing leadership, guidance and consulting services to help enhance their decision making process.

"FleetWeather has worked hard over the past several years, taking on a big vision and some big challenges, to design a service that helps global shipping leaders make better decisions and do it more often," said Jess Hurwitz, FleetWeather's director of sales and marketing and CTO. "It's been exciting to witness great shipping companies get even better, even in poor market and economic conditions, as they engage in new and expanded ways to make decisions with our assistance and guidance."

"Engaging FleetWeather permits our clients to be liberated from data-oriented tasks helping them to clear their minds and be able to focus their entire efforts on managing their business," said Trevor Bevens, FleetWeather's marine operations director. "Once these burdens are removed and assumed by FleetWeather, most clients start to discover things about their business and operations that they never realised before."

While most vendors in this market segment have moved to automation and providing stand-alone software offerings, FleetWeather said that it had continued to focus on

delivering solutions with a mix of technology and analysts.

Wide range

FleetWeather offers a wide range of services, all of which can be fully customised to meet the exact and changing needs of their clients. All the services rely on three core components in the company's delivery process:

Front-End Presentation Portal – A matrix of multi-media and multi-dimensional client customised deliverables, reports and tools. This front-end delivery, reporting and presentation vehicle allows FleetWeather to provide a single client with options for different reports and information to be delivered to multiple people at varying times across different media.

Conduit of Information – Linking the back-end data array and front-end client deliverables, this information conduit is fully managed and monitored by the team of analysts partnered with optional third party managers, resources and technical experts.

Client information on the conduit is filtered, analysed and interpreted based on the client's individual reporting needs. As a client's needs change, so can the mix of expertise and talent that manages and oversees their data on the conduit.

Back-End Data Array – The company's data array serves as the collection place for individual client data from various information sources, data collection points and partner data exchange services.

All information collected by FleetWeather is verified for accuracy prior to being archived in a database and being available on the conduit of information to the analysts. Data sources can be customised based on a client's needs with information being able to flow in, or out of the data array for shared services and workflow intervention.

To provide the highest quality solutions, FleetWeather said that it intended to partner with many other well-known shipping industry innovators that will share and exchange information.

Hurwitz told *Tanker Operator* that the business is split around 10% domestic (US) and 90% worldwide currently spanning over 60 countries.

Tankers

Hurwitz said: "The majority of our clients currently are tanker owners and tanker pool operators. I'm not sure of the exact percentage but I would estimate 65%-70% of our work currently circulates around tankers. The majority of our growth over the past few years has been primarily from the tanker sector.

"All of our new services and the ultra-customised deliverables we provide have come from working closely with the tanker clients and their very unique and individualised needs. They all do things very differently and especially when compared to other types of ships and operations.

"One of our clients commented that we were the first vendor they encountered in the industry that respected the unique ways they (tankers) operate and did not try to treat them like other types of vessels. The ability of our services to be client customised to their exact needs and adaptive to changing market conditions, relationships, and business strategy and model seemed to match perfectly with what they were looking for.

"There are many rapidly progressing market and industry trends that effect tankers that we are already able to handle currently and many more that we are developing partnered closely with our clients. We also work with many tanker pool operators providing them not only with operational support for their vessels and pool partners but also pool management support as well.

"The tanker market is definitely active and gaining momentum. All of our tanker clients are doing well with most growing and expanding rapidly. Over the last few years, they have adapted unique strategies and ways of doing business and are now poised to take advantage of today's market," he concluded.

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Are Eco ships all that they are cracked up to be?

Euronav has claimed that it had demonstrated that by installing a Becker Marine Mewis Duct, savings of between 10% on a VLCC to 7% on a Suezmax can be achieved.

The following is an extract from a paper prepared by Euronav to address the question of whether the company should order VLCCs and/or Suezmaxes to take advantage of the impact of current designs on fuel oil consumption on the back of rising bunker prices.

A VLCC's daily bunker consumption could be above 100 tonnes fully laden at full speed (15 knots). Given a bunker price of \$600 per tonne, this amounts to \$60,000 per day, which represents the bulk of the voyage costs.

This can be compared with the cost of timechartering a VLCC for one year at \$18,000 per day, or owners standard operating expenses of \$12,000 per day - excluding any depreciation of the asset, amortisation of debt and interest cost.

If the gross daily return for a VLCC is

\$78,000 per day, then, after voyage costs, the return to an operator of a timechartered-in vessel is zero and for an owner operator only \$6,000 per day. This is not enough to pay debt service, or any other investment returns.

Owners have responded to this fuel price hike by reducing their operating speeds and consequently reducing their fuel consumption in a market where fuel cost variant through consumption is more important than time.

So called super slow steaming has proved to be so effective that the world tanker fleet has uniformly changed operating speeds from 15 knots when laden to 13 knots and from 15 knots in ballast to 10 knots.

A number of additional measures can be adopted to save fuel and reduce costs, each of which may be more, or less effective depending on the characteristics of each vessel and the trade in which it is used.

No one method will deliver an improvement in all trades and while sailing is the most significant activity for fuel consumption, there are an important number of days spent waiting on demurrage, or idle, or pumping. Reducing consumption at these times is also relevant.

For example, a ship with an electric heavy fuel heater can switch off its boiler when slow steaming, or drifting and this can save five to six tonnes per day (\$3,000 to \$3,600), which is as much as the savings claimed for new ships (so-called Eco) over old ships in reduced sailing consumption. This retrofit costs no more than \$30,000 and can be installed by the ship's crew, a payback period of less than 10 days waiting time.

Euronav's technical and operational departments were asked whether newbuildings were really offering a 30% reduction in consumption and they advised as follows:

1) What is the benchmark?

Fuel savings are usually referred to as the percentage reduction in consumption of one ship over another and yet even before the most recent designs some ships were 10% better consumers than others. So the question always needs to be asked in the context of one specific class of ship over another (age, size, make and equipment manufacture).

Those in favour of new vessels nearly always choose the worst performing ships in the world fleet as the benchmark for comparison with their new designs. This gives the impression that the differences are huge but in fact they are not and with good operations and retrofitting they can easily be replicated.

2) Who is the operator?

Consumption can only be measured on the basis of the same speeds and in the same sea conditions with the same laden/ballast



A VLCCs hull shape cannot easily be changed.

conditions. The experience of the crew in loading the ship to optimise trim, operating the main engine and other equipment, navigating the ship to take advantage of currents and to avoid bad weather, are all key elements in reducing consumption. Even the most optimal consuming ship can waste power and therefore bunkers by sailing into a storm.

Quality of operation has been demonstrated to have a value on a continuous basis of up to 10% between good operators and average operators. It can be a wider margin with poor operators.

Euronav said that it had an excellent record of continuity of service and personal professional development for its sea staff, as the average years of service in the company for the Masters is 19 years. This level of operational competence is critical in delivering performance and managing consumption.

3) Choose your speed

Engines are optimised to a particular power range, so a uniform out performance over all speeds is not possible. The choice of speed is dependant entirely on commercial factors related to freight compared to voyage cost and in particular bunker expense.

It is important not to permanently handicap a ship's speed to improve economy in a poor market because, in a good market, the value of time will become paramount (not the cost of the voyage) for the returns on investment.

4) Hull shape can barely be changed in a tanker

Hull shape is critical in determining resistance but tankers optimise their carry capacity and freight earning through having a very boxy shape (a high cross block coefficient), which unfortunately maximises resistance.

This cannot be significantly modified without losing freight (earning) capacity – a situation that is quite different from containerships.

5) Coatings

The hull surface causes friction in the water, which is reduced through coatings. These are damaged through normal wear and tear. Even new ships see appreciable deterioration through a five-year cycle from their delivery at the shipyard to first drydocking.

This can cause a variance in performance over the five-year cycle where in the last year the ship is performing more than 10% worse than in the first year of the cycle. This may warrant more regular dockings just for painting even if not required for a vessels



Euronav also addressed its Suezmax fleet. Photo credit Solar Solve Marine.

survey cycle. Modern coatings can be applied on old ships.

6) Propulsion efficiency

Propulsion comes not only from the main engine but also from the flow of water over the propeller and the single most effective measure to enhance this is to retrofit a Becker Marine Systems' Mewis Duct.

Euronav said that it had demonstrated that the installation of a Mewis Duct results in savings of between 10% on one class of VLCC to 7% on another class of Suezmax.

The cost of this retrofit, which takes place in drydock is less than \$500,000 - a payback period of less than half a year!

Euronav said that it will retrofit its entire fleet as are two other owners known to the company amounting in total to 40 retrofitted VLCCs.

7) Shipyard marketing versus reality

Shipyards do not guarantee speed and performance of the vessel as a whole. They will guarantee fuel consumption against engine output in a bench top exercise but not as a sailing ship.

Some shipyards in South Korea are now admitting that when they advertised the fuel saving capabilities of new tanker models, their theoretical claim of 30% savings will likely translate to 10% when the ship is operational. Furthermore, the new designs do not anticipate fuel regulatory changes expected to impact in the coming years.

The question was put to Euronav's financial and chartering department as to whether a newbuilding would earn a premium to the market and if so would it turn out to be a good

investment?

A) Voyage charter market is oversupplied

New ships with high depreciation may make a loss regardless of their consumptions and bunker costs being lower than a competing ship. This is already apparent today in the variance between existing ships. It is better to have better consumptions for certain speeds but the key question is whether the owner retains the benefit and whether it warrants the risk of investing in expensive newbuildings.

Ships compete individually in a voyage charter market, not as a fleet. They are eligible through their suitability for the trade and their position, being such that they can reach the load port on, or before, the expected time for loading with suitable certification and inspections completed and valid. Ships are auctioned where the lowest bidder will get the first opportunity to negotiate and fix the terms. The cheapest eligible ship will fix the business.

Today, a number of retrofits, which significantly improve consumption across all speeds are available to the owner. These retrofits are for the most part not compatible with one another. Euronav has chosen one to be applied to all its modern ships – the Mewis Duct.

When comparing a retrofitted Suezmax with a newbuild South Korean Suezmax, the difference is no more than three tonnes of fuel per day on paper. The company's ships are sailing in open sea conditions for about 290 days per year, which is when the improved consumption figures will make a difference.

The value differential of the better consumptions on an annualised basis is

therefore three tonnes at 290 days at \$600 per tonne, or about \$500,000 per year. However, this advantage can be easily lost through poor chartering, or through poor management of the bridge and engine room.

Over the lifetime of the ship, the differential in potential value is unlikely to be more than \$3-4 mill, as the newbuilding will have periods of underperformance, including market and sea conditions, which do not reward the potential. However, the difference in price between the latest ordered VLCC newbuilding and a vessel built in 2008 is over \$30 mill!

The price of a 2008 South Korean built VLCC can be estimated at \$60 mill, compared with a newbuilding ('so called eco') sold ex yard at \$90 mill. If it is assumed that a total return to capital of 7.5% and a 20-year life to a scrap value of \$16 mill, then there is a significant difference in the breakeven cost for the two assets. The 2008 VLCC costs \$16,700 and the 'new' VLCC \$23,000. This is a daily handicap for the new ship of \$6,000 per day that can never be won back through operational efficiency and fuel saving.

B) Timecharter market does not decrease supply

Rates which are used for timecharter business are based on TCE earnings produced in the voyage market to which either a discount factor will be applied if the market is thought likely to be worse during the period proposed, or a premium factor if deemed to be better.

It is of real value to the charterer to have lower consumptions warranted by the owner than other ships, as this should translate into voyage market better for the charterer.

The charterer will have an express right to claim any loss caused to the charterer through the ship not performing as described.

The full extent of any difference of performance may not be realised because this is only a potentially better performance and the charterer cannot be sure that it will be as described (even shipyards do not warrant this!) and, more importantly, the use of the vessel may not give opportunity to realise the value of the difference.

An obvious example of this would be if the vessel was used for storage and not sailing for a significant part of the proposed timecharter

period. In this case, a charterer might like to have a better performing ship but will not want to pay anything for that potential.

Conclusion

Existing good quality fleets maximise investor leverage to market gains - newbuildings do not. All VLCCs move cargo in the same market and the poorer performance of the older and less efficient ships is reflected in their lower acquisition prices, which of itself creates an interesting investment case.


Newbuildings increase supply and consequently decrease market rates. This means that a new ship has no competitive advantage for an investor in a market that is over supplied.

The real advantage of a newbuilding with a better speed and consumption will only be seen at full speed (for which they have probably not been designed) when the ships maximise time over cost, thus the newbuilding will have the maximum number of days with lower voyage costs.


However, in the very same market, older cheaper vessels will return by far the best results financially for the investor.

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A major service centre at a strategic location

The Gibraltar Port Authority (GPA), together with the Gibraltar Maritime Administration, is continuing to develop its marketing strategy to promote the Gibraltar Port as a major maritime services hub, along with the Ship and Yacht Registry and the many ancillary services available from the ‘Rock’.

For example, the GPA’s Captain Roy Stanbrook and Richard Montado of the Gibraltar Maritime Administration attended last September’s London International Shipping Week and participated in a series of seminars and lectures concerning a multitude of aspects related to the shipping and maritime sectors. There was also discussion as to how London supports the role and commercial activities of its port and interfaces with it.

During the week, Capt Stanbrook also had face-to-face meetings with several shipping professionals, including international bunkering operators and specialist lawyers in the field of maritime and shipping consultancy.

In November 2013, Capt Stanbrook also travelled to Hong Kong to attend the International Bunker Industry Association (IBIA) meeting and while in the Far East called on shipowners in Hong Kong and Singapore.

This marketing effort was driven by the Gibraltar Government and in particular Minister for Tourism, Commercial Affairs, Public Transport and the Port, Neil Costa MP. He said in a release that the efforts undertaken

by Capt Stanbrook and by Montado have enhanced the port’s reputation as a leading maritime centre for the international shipping community in the western Mediterranean.

The Port of Gibraltar’s strategic position at the confluence of two of the world’s busiest sea lanes has enabled the GPA to develop as a major bunkering port with reported sales of 4 mill tonnes of bunkers last year. By comparison, the volume of bunkers sold barely reached the million tones mark in 1990. “We have gone from strength to strength and everything indicates that this trend will continue in the years to come,” Capt Stanbrook said in the release.

Bunkers are normally delivered by barge/bunker tanker while the vessel is at a dedicated slot in the Western Anchorage, however, fuel can also be delivered to a berth in the harbour.

Safety and environmental concerns are given top priority by the Government, which applies strict regulations. The Bunkering Code of Practice was completely revised in January 2011 and the bunkering superintendents continuously monitor all operations in the Port. Gibraltar is also an associate member of

the UK-based Oil Spill Response (OSRL).

Ancillary services

Although bunkering accounts for the major share of the port’s activity, the provision of highly specialist, professional and technical ancillary services to shipowners has grown exponentially in the past decade. For example, the port carries out extensive provisioning for vessels, including drydocking, crew changes, water, food, stores, paints and maintenance.

A major plus for visiting ships is that they will be able to acquire what they need within hours of being in British Gibraltar Territorial Waters, the GPA claimed.

The port is also taking advantage of 21st century technology to provide instant information to business partners and stakeholders, with a recently launched mobile-optimised version of its website for smartphones.

In addition, port and maritime activity provides both direct and indirect employment for a substantial cross-section of the population.

Another selling point that the GPA highlighted was the legal system, which mirrored that of the UK and acted as a focal

point of interest for maritime firms. Gibraltar remained a favourite port for arrests where the jurisdiction ensured expeditious and equitable treatment.

“We do not accept any vessel just for the sake of accepting them; there is a vetting process in place and this constitutes a huge attraction for companies because they know they will receive excellent service in Gibraltar,” said Capt Stanbrook in the release.

Gibraltar's stature as a leading refuelling port for the international shipping community, with bunkering as its main undertaking representing 85-90% of total activity, has been built up on the highest operational and environmental safety standards.

The GPA's membership of the Green Award Scheme highlighted this commitment, the GPA claimed and all types of vessels calling, not just oil and chemical tankers, which hold this certification, are afforded a 5% discount in tonnage dues, plus other financial incentives. The discounts were in place on 1st April this year.

Legislation in place

As mentioned, the GPA has established stringent legislative and regulatory standards

and procedures for the supervision of bunkering operations, including the inspection of vessels by one of two bunkering superintendents who carry out necessary checks of ships prior to ship to ship transfers (STS) of cargo. The port also operates a regime of spot checks on bunkering operations to ensure a consistent quality of operation.

The GPA also operates a well-practiced response capability to react to the unlikely event of an oil spill. The levels of response are in line with those required by relevant and domestic international legislation. In addition, cover for a larger spill is afforded by a contractual agreement with OSRL.

Although the GPA has appropriate resources, bunker companies are also required to have their own counter oil pollution capability on board their vessels and ashore. “Our personnel and the companies working in the port are well trained and competent, carrying out regular oil-spill response exercises to make sure they are capable and aware of what they have to do and what we would need from them in the case of an incident,” said Capt Stanbrook in the release.

There is also close co-ordination and regular meetings are held with major players and the local emergency services for the purpose of contingency planning. In a move to reduce the danger of pollution and considerably strengthen environmental legislation, the GPA now only offers STS operations within British Gibraltar waters and has banned activities associated with Gibraltar outside its jurisdiction.



WSS' Gibraltar manager Nikolai Bado.

The GPA has allocated a priority anchorage for STS transfers and the plan has resulted in a healthy demand from the market. When the move was originally introduced, it was feared there would be a drop in trade but the outcome has been positive, generating even more income with between three to four STS operations carried out on a weekly basis, the port claimed.

These operations carried out in a controlled environment within territorial waters rather than in unregulated waters, are stringently inspected and regulated to ensure compliance with local and international guidelines and regulations.

Crew exchange

Crew-changes are another important aspect of the port's service facilitated by the close proximity of the airport, which the Gibraltar Government supports by allowing an immigration regime for a number of nationalities where difficulties would be encountered elsewhere in Europe.

This is very convenient for shipowners and operating companies who can easily fly or ferry crews into Gibraltar, while a vessel is in transit with very little deviation needed to



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Bunkers only calls

Year	Number of vessels
2009	6,712
2010	6,724
2011	6,181
2012	6,362

Source: GPA

exchange crew.

Neighbouring ports' immigration services are usually subject to visa requirements, which can limit the nationalities of the crew handled.

Gibraltar also provides facilities for shiprepair, ranging from the Gibdock shipyard to a broad range of mobile facilities available to carry out a wide spectrum of services, including anchor replacement and bottom scrubbing.

The GPA recently installed a Transas VTS, which can monitor vessels approaching Gibraltar and manage their arrival and departure and provide advice on traffic movements within congested port waters.

To give some idea of the volume of shipping calling either in the port or at the anchorages, last year, as well as the 6,363 callers for bunkers, there were 173 cruise vessels, 161 general cargo vessels, 127 vessels repaired, 1,259 calls off-limits and 444 others.

The storage of fuel oil present a problem in such a confined space. To overcome this problem, there are usually at least two floating storage tankers in the Western Anchorage. During October of this year, the 1997-built Aframax *Vemaspirit* and the similar vintage LR1 *Andre Jacob* were stationed off Gibraltar, lifting fuel oil from visiting products tankers and transshipping to the bunker tankers, as needed.

According to Wilhelmsen Ships Service's, Gibraltar-based Ships Agency Service Manager, Nicholai Bado within the Strait of Gibraltar ports (Gibraltar, Algeciras and Ceuta), vessel calls have maintained a steady trend but for bunkers, price and availability are still the main reasons for selecting a particular port. Most of the local bunker suppliers offer low sulphur fuel, as well as all grades of HFO.

He also confirmed that the new dedicated STS area is within the bunker zone anchorage area. Owners and operators book their position in advance with the GPA, which allows the vessel to proceed into anchorage and carry out the operation.

The port is now investigating the setting up a second STS location, in order to increase availability for this kind of operation. "This market had previously declined due to the lack of availability with only one dedicated STS location, so efforts are now being made to bring it back," Bado said.

During *Tanker Operator's* last visit to the 'Rock' a couple of years ago, WSS had been able to organise crew transfers through nearby Malaga airport, as well as Gibraltar, which was recently enhanced with the opening of a new terminal. Bado confirmed; "Transferring people via Malaga airport is not a problem and still works fine."

At the beginning of 2012, WSS launched what it calls 'Your Strait Solution' initiative—an integrated service solution for vessels passing through the Straits of Gibraltar.

According to Bado, 2012 was an 'intensive year', with the centralisation of one dedicated team and the co-ordination of services within the three Strait ports of Algeciras, Ceuta and Gibraltar.

Speaking at the beginning of this year of the initiative's 12 months of operation, Bado said: "We are on track to exceed all initial expectations of the project and have made a number of tweaks to the service over the past year based on customer feedback. Many customers are reporting significant cost efficiencies through having just one point of contact. For example, a vessel needing to take

on bunkers at Gibraltar and liferaft exchange services at Algeciras will pay just one agency fee – streamlining operations for all involved."

With no signs of rapid improvement in the market, demand for reliable ships agency services is on the rise – coupled with a need to stay competitive on price – and Bado believed that those suppliers that are able to adapt to market challenges will have good potential for growth.

Furthermore, he said that centralisation of services has proven to be the way forward, especially during the financial recession: "It is vital that we maintain the quality standards expected of our operations while being able to work within the financial constraints that our clients face. 'Your Strait Solution' is just one example of how we are accommodating the needs of our customers in a turbulent market."

One of the leading electronics installation, service and repair concerns in the region is Sandvik.

Since the last time *Tanker Operator* spoke with Sandvik's John King, he said that the company had taken on agency work for Hyundai and Samsung, Denelec, Furuno and Totem. This mainly involves annual performance testing of equipment installed on vessels.

He also said that the company can now offer radio and VDR surveys on behalf of classification society RINA.

In addition, next year, Sandvik will be opening a Singapore office and forming Sandvik Marine Asia.

Overall, the company works with equipment and OEMs, including Sailor, Maris, Thrane & Thrane (Cobham), Kongsberg, Sperry (the only official; agent on the 'Rock'), Furuno, Skipper, Danelec, Samsung and Hyundai. **TO**

Strait of Gibraltar analysed by the Danish Maritime Authority (DMA)

The DMA was answering the questions - How is safety of navigation affected if a shipping lane is changed? What is the risk of a collision in specific waters?

The DMA said that it used risk analysis tools to assess this and have passed on their findings to other interested parties.

This was the case when the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) held a seminar in Madrid last month on the use of risk analysis tools. Some 33 persons from all over the world attended the seminar.

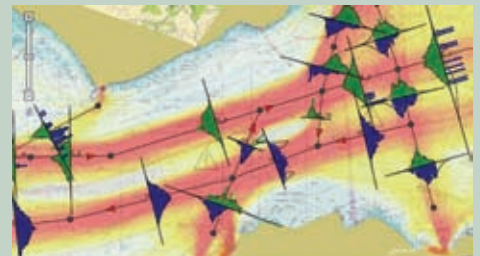
The DMA showed the participants how to use its experiences gained with risk analysis

tools in the very busy Strait of Gibraltar between Spain and Africa.

Among other topics, the DMA presented the use of the risk assessment tool IWRAP (IALA Waterway Risk Assessment Program).

This has been developed in co-operation between the DMA, IALA, software company Gatehouse, the Technical University of Denmark and a number of foreign universities.

The program can be used to calculate the actual probabilities of collisions and groundings in specific waters and to predict what will happen if shipping lanes are changed, or if the shipping traffic starts behaving differently than before.



The DMA took the Strait of Gibraltar for a risk analysis exercise.

In Denmark, the program has inter alia been used to analyse the risk associated with replacing a light with floating aids to navigation while the effect of closing down and changing shipping lanes was also analysed. ■

Managing the charterparty

Following the launch CP-Desk, a sister company of DA-Desk, *Tanker Operator* spoke with managing director Captain Errol Gonsalves, about the new service.

Basically, the company was set up to provide an independent service to reduce risk and manage charterparty (CP) costs. It solely focuses on one labour intensive, time-consuming administrative aspect of the shipping industry—charterparty management.

The company said that by taking away this task, it enables owners, operators and brokers to concentrate their time and attention on vital operational issues, while mitigating the risks of commencing voyages without a duly signed contract.

Unlike online solutions, CP-Desk operation is conducted manually and the company provides a trained, dedicated team for its patented CP-Audit and CP-Draw services. The teams are charged with ensuring the accuracy of the CPs and providing key management reports.

CP-Audit has been designed to minimise risk for owners and operators by eliminating CP errors. This service features a dedicated team that reads, verifies and audits the pro forma, final recap and CP drafted by a broker.

CP-Desk also provides CP-Draw, a service for brokers that focuses on the drawing up CPs. Like CP-Audit, this service provides dedicated teams that work closely with clients to ensure that CPs exactly reflect the terms of the agreement.

The process remedies the all too common industry practice of fixing the next business 'as per last,' that allows errors to flow unchecked from one CP to the next.

Capt Gonsalves, said; "As a Marcura Group company, like DA-Desk, we are a completely independent service provider with no ties to owners, charterers or brokers. As we began looking at the issue of CPs in 2011, we

strongly believed that our underlying philosophy would greatly benefits owners, charterers and brokers in the drafting, verification and overall reporting of CPs. Today that has proven to be the case; our customers have confidence that we can handle their sensitive information without question.

"We also believe that in today's environment, CPs require the personal attention of trained professionals, rather than shipping trainees, as is often the case. Thus, we established CP-Desk to give CPs the expert attention they need and to help owners, charterers and brokers limit their exposure to expensive liability issues."

By the end of September this year, CP-Desk had signed up three major shipowners and 10 shipbrokers.

All CP types

Capt Gonsalves told *Tanker Operator* that the service can handle any type of CP, either standard, or private, such as company specific CPs, also in terms of voyage, timecharter and bareboat charter forms.

CP-Desk offers a service to include all vessel types and had already processed some tanker CPs by the beginning of October. "However, we understand that because of the CP administration clause, there is not always a physical CP in the tanker sector," Capt Gonsalves explained.

He also stressed that the company's focus is to assist with CP administration tasks and would not become involved in any legal issues. "We currently do not function in an advisory role on legal issues covering CP clauses, etc. The customer retains control in the negotiation until fixed. We handle all tasks

once the fixture is completed," he said.

CP-Desk's operations team is based in Dubai and includes Gonsalves who is a Master Mariner with 20 years sea experience; holds an MSC from Cass Business School, London; is a Fellow at the Institute of Chartered Shipbrokers (ICS), Dubai chapter; worked at DA-Desk for more than eight years implementing new customer and internal policies ensuring adherence to the company's values, prior to starting the new venture two years ago.

"The operations manager holds a Bachelors degree in commerce; a Diploma in business management; an Advanced Diploma in software engineering and is about to complete his ICS studies. He has 14 years' experience working in various ship agency operations capacities; global port disbursement accounts; sales and marketing for liners; freight forwarding and customer service.

The team leader is a commerce graduate from Calicut University in India; has 25 years' experience in financial accounts and management, 17 of which have been in the shipping industry. He is at the ICS exam qualifying stage.

"The other members of the team are university graduates, all with shipping industry experience," Gonsalves said.

Finally, he said that CP-Desk is today a separate business, but over time systems integration and a common group software platform will provide one seamless post-fixture solution- albeit with different deliverables.

Port payables

Meanwhile at the beginning of November, sister company DA-Desk launched the

“we established CP-Desk to give CPs the expert attention they need and to help owners, charterers and brokers limit their exposure to expensive liability issues.”

Captain Errol Gonsalves, managing director , CP-Desk

“...for the first time, our customers can have instant access to all relevant information on their port-related expenditures...”

patented PortPayables Dashboard.

Offered at no additional cost to PortPayables clients, this Dashboard provides an at-your-fingertips comprehensive overview of all port expenditures that have been settled through its PortPayables services. The specific detailed information in the Dashboard empowers users, including controllers, finance managers, accountants, operators, and CFOs to make better informed decisions and ultimately take action, the company claimed.

“In my past experience with leading finance organisations, I often found it difficult to readily access information on expenses and suppliers precisely when I needed it,” said Domenico Carlucci, DA-Desk financial services director. “Now for the first time, our customers can have instant access to all relevant information on their port-related

expenditures, including statements of account per port agent, savings generated for management accounting reports and cash flow forecasts for day-to-day practical needs.”

PortPayables is DA-Desk’s cash management service. It is comprised of four pillars - DA-Accounts, DA-Forex, DA-Cashflow, and DA-Compliance.

These four components manage all tasks related to payment, transfers, confirmation, netting, accounting and reconciliation. With the Dashboard, all relevant information from these components can be viewed in an easy to use format.

The Dashboard software provides the data points necessary to allow controllers to manage, evaluate, and enhance controls to their payment processes. In addition, it enables them to maximise cost savings through

payments in local currencies rather than in US dollars and also helps to ensure that overfunded balances are being collected and that there is a robust cash flow process.

It also helps accountants respond more quickly and completely to endless internal and external reporting requests. The data can be uploaded into an organisation’s accounting system, making the accounting process much smoother.

Operators can get access to vital immediate and historical information that helps them work more effectively with port agents. Dashboard allows operators to see at a glance the latest information on agent accounts; data on overfunded agents; spend by vessel and spend by port. Having the data in one place, at their fingertips, helps operators deal with the complex and ad hoc tramp business, the company said.

CFOs can view the high-level financial picture and confirm that their teams have the information they need to monitor and streamline financial processes.

Port spend is a substantial portion of a P&L and can change the bottom line, DA-Desk stressed.

TO

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Enhanced antenna operations for new generation of satcoms

Maritime satellite antenna manufacturer Intellian has introduced several new initiatives to enhance communications on board ship, both for operations and crew leisure.

One initiative is the Intellian v240M, a 2.4 m multi-band maritime antenna. This is claimed to be the first VSAT antenna designed for the maritime industry with fully automatic switching between Ku-band and C-band.

Multi-band satellite communications are becoming an increasingly important capability. Vessels now operate in a more wide geographic area. This means they face an ongoing need to switch frequency bands as they move between operational areas. Until now it would require the crew to physically change antenna components to achieve a band change and in many cases install multiple antennas.

The system has built-in software and hardware, which automatically switches between Ku-band and C-band, providing the end user with seamless operation and no need for technical intervention. It has been designed for ease of installation and robust manufacture, which protects the on-deck equipment from the harsh elements.

All Intellian VSAT antenna warranties now stretch for three years for parts and one year for labour.

On deck, the 2.4m antenna is protected in a radome, which contains the Ku-band RF system, C-Band RF system, antenna control system and power supply units. An optional air conditioning unit can also be provided, which will maintain optimal performance when experiencing excessive temperatures. Below deck the antenna control unit is interfaced with ship information systems, such as gyro.

It can be controlled remotely via Intellian's App 'APTUS', which displays a simple to understand graphical dashboard that allows logging, recording and fine-tuning of the antenna for optimum performance.

In addition, Intellian's new v100GX 3-Axis dual-band VSAT communications antenna is a technically advanced antenna prepared for Inmarsat's upcoming Global Xpress (GX) Ka-band broadband service. It can be upgraded to the service with minimal technical intervention, as it takes just minutes to complete the conversion, the company claimed.

Conversion kit

The plug-and-play GX conversion kit (comprising GX BUC/LNB assembly, GX Feed assembly and GX ACU incorporating the

Intellian is gearing up for Inmarsat's Global Xpress offering.

modem) is claimed to be quick and easy to use and does not require a factory trained technician to mount.

The antenna's functionality can be easily transformed into the GX high-throughput broadband global service when Inmarsat's I-5 Ka-band satellites are launched and operational in 2014.

When converting the system from Ku-band, the antenna reflector does not need to be changed as the RF section is mounted on a single modular chassis enabling quick conversion to Ka-band operation without any system re-balancing.

The 1m v100GX incorporates a dual-band, carbon fibre reflector and tuned radome for consistent service, whether operating on the existing Ku-band, or converting to Ka-band when available next year.

The VSAT antenna system meets DNV Standard No.2.4, Class C and MIL-STD-167-1A specifications.

At the same time, Intellian launched a mobile version of its new Aptus graphical interface based software for remote monitoring and control of the company's VSAT antennas. The development of the Aptus Mobile app enables users and operators to have direct connection to their antenna's operational data wirelessly via the unit's built-in Wi-Fi network.

Aptus is compatible with all Intellian VSAT antennas and can also be used on the 3-Axis TVRO systems. Straightforward IP connection over the Internet from anywhere in the world and set-up, coupled with the antenna status reporting helps to increase the performance of the antenna, as well as debug the system. There is also an in-built auto-diagnostic function that can connect to the VSAT ACU by Wi-Fi.

To enhance the speed and reliability of its

maritime antennas for VSAT connection and TV reception for seafarers, Intellian is now offering Fiber Link, which is a single fiber optic cable connecting the antenna with the below deck systems.

Previous connections were undertaken with multiple coaxial cables, which are more difficult to install, heavier and less effective than fiber optic. Fiber Link combines several RF signals into a single fiber optic cable, which provides virtually no signal loss for either VSAT, or TV reception.

This system requires two modules to effect connection, a below deck unit which connects to the antenna control unit and modem, while the above deck unit is mounted inside the Radome base

Also recently introduced was the dual-band 3-axis Intellian s80HD WorldView TVRO antenna, which is aimed at larger vessels requiring global uninterrupted TV coverage.

Featuring the latest LNB technology, the 83 cm (34 inch) dish s80HD WorldView antenna incorporates Ku-/Ka- band WorldView Trio LNB (low noise block-down converter) with triple feed horn, which enables HD and SD TV to be watched anywhere in the world.

The antenna simultaneously receives two Ka-band satellite signals and one Ku-band signal for DIRECTV North American programming, enabling all channels to be watched simultaneously. The user will have access to HD TV in the Mediterranean, as well as when sailing to and from the Caribbean and in North America.

An Intellian app is available for download to enable users to select their preferred TV satellite while sailing from region to region and operate their antenna from an iPhone, iPad, or their chosen device.



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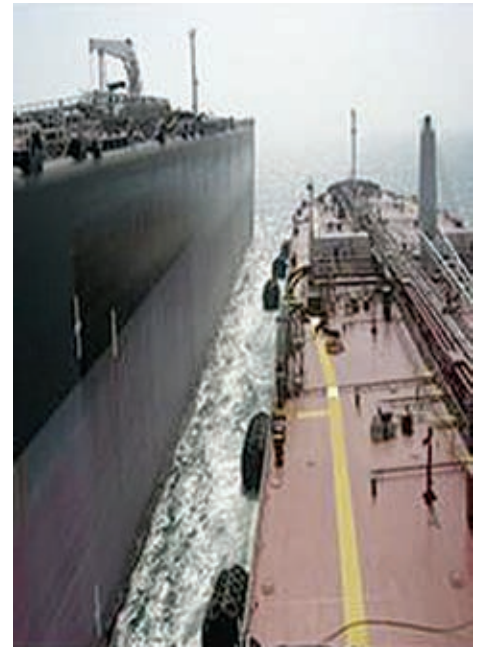


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Ambitious new training centre set to open

Originally conceived for the development of PureSOX and other emission control technologies, it has grown to incorporate far more than just exhaust systems, the company said.

Located on the site of the former Aalborg Shipyard in Denmark, the new Alfa Laval Test & Training Centre houses a large ship simulation facility with a testing area of 250 sq m, where one of the highlights is a new generation of PureSOX currently under development.

Added to this are a dedicated control room and a training complex for visitors, the first of whom were the Crown Prince of Denmark and the Danish Minister for the Environment, who toured the site during September.

“We’ve said that the Alfa Laval Test & Training Centre will be the closest thing on land to the machinery room of a full-sized commercial vessel and the truth of that becomes clear as the facility nears completion,” said Lars Skytte Jørgensen, Vice President of Alfa Laval Product Centre Boilers, which is responsible for the facility. “Nowhere else in the world will you find this range of marine equipment in a full-scale, real-life operating context – except on a vessel at sea.”

To as great an extent as possible, the centre is designed to mimic the operation of a commercial vessel. For this reason the equipment is not installed as isolated components, but rather as an integrated system complete with heat exchangers and other auxiliaries, Alfa Laval said.

There are several interconnected process lines, such as:

- **Fuel line** - providing fuel cleaning, conditioning and forwarding prior to the engine.
- **Integrated water line** - combining cooling/process water and ballast water flow.
- **Steam line** - incorporating desalination, waste heat recovery and steam production.

Alfa Laval’s Test & Training Centre is to be officially opened on 15th January 2014.

■ Exhaust gas line - focused primarily on emission control.

With the exception of the combined line for cooling/process water and ballast water flow, these lines overlap in exactly the way they would on board an actual vessel.

What differs from a vessel is the way the equipment is controlled and monitored. Instead of equipment-specific control systems, the facility has a common control platform to which each component is connected. For the operators and technicians, this creates a single interface that can be accessed remotely from a single screen. All equipment can be steered from a central control room 30 m from the testing area, or even from other Alfa Laval sites worldwide.

Medium-speed engine

At the heart of the testing area layout and also connected to the control platform, is a large medium-speed marine diesel engine. This 4-stroke, MAN 9L28/32 engine weighs around 48 tonnes and supplies about 2 MW of output power, which will be fed into Aalborg’s local grid.

Attached to the engine is a PLC for connecting it to the control network, as well as Alfa Laval’s PureVent, a centrifugal separator. PureVent will allow the reuse of the oil mist contained in the crankcase gas.

The fuel for the engine, which will initially be HFO and MDO, will be treated using a standard setup of Alfa Laval fuel line products. A high-speed Alcap separator has been installed for fuel cleaning, while a new version of the fuel conditioning module (FCM) will handle fuel conditioning and changeover. HFO will be pumped into the facility from the outside, where it is stored in a

double-shelled 50 cu m tank with insulation and internal heating elements. MDO is stored in a smaller 5 cu m capacity tank.

Integrated water line

Also to be pumped into centre is seawater. This will come directly from the Limfjord, which is a body of water connecting the Kattegat Strait with the North Sea. For this purpose, an 800 m pipeline with a diameter of 250 mm has been built between the fjord and the facility.

On an actual vessel, there would be a number of separate water lines. But here the flow diverges from a single inlet into two flows: one for cooling/process water and the other to simulate ballast water. Primarily for the needs of the ballast water simulation, a flow of 300 cu m per hour will be delivered by the pipeline.

The ballast segment of the water line is fitted with a PureBallast 3.0 system, whose main component is a Wallenius AOT (advanced oxidation technology) reactor with a flow capacity of 300 cu m per hour. The system will be used for customer demonstrations, as well as for testing and product development.

The remainder of the water flow will be used to generate fresh water for the boiler and scrubber water cooling, as well as other technical needs. Desalination of the seawater will be carried out by Alfa Laval’s AQUA, a freshwater generator that manages the entire process within a single plate pack.

In providing low-salinity water, the AQUA freshwater generator is also an essential part of the facility’s steam line. Water that is not used for cooling will enter a make-up water tank.

The boiler served by the make-up water tank is also a part of two lines, since it is designed to take its heat from the exhaust gas leaving the engine. Alfa Laval claims to be the world leader in this type of waste heat recovery solution and the construction chosen for this particular boiler consists of bare water tubes.



Alfa Laval's Test & Training Centre will contain most of the machinery fitted in a typical ship's engine room.

The steam generated by the boiler will be converted into district heating by means of a steam/water condenser. This, in combination with the electrical power provided by the engine, will make the centre an energy source for the city of Aalborg.

The exhaust line, which the waste heat recovery boiler is also a part of, will initially be the most research-oriented aspect of Alfa Laval's centre. This facility was originally conceived as a means to speed up the introduction of emission control systems. With ECAs entering into force in 2015, emissions have become a key focus for both Alfa Laval and the marine industry at large.

"With new caps on air emissions approaching quickly, customers want to know that we have the innovative muscle to win the race," said Jørgensen. "The resources of the Alfa Laval Test & Training Centre give us everything we need to put the introduction of new exhaust gas cleaning systems on a fast track."

Besides pursuing further developments related to the PureSOX scrubber technology, the facility will be targeting NOX reduction. Having worked extensively with exhaust gas recirculation (EGR) via the PureNOX scrubber water treatment system, the company will begin a parallel exploration of selective

catalytic reduction (SCR) in a project with official funding from the Danish Environmental Protection Agency. To this end, the exhaust line has been fitted with an SCR unit, developed in co-operation with Haldor Topsøe.

For the purposes of testing, there is also an exhaust gas heater, which will ensure the high exhaust gas temperatures necessary for SCR when the engine is not at full load.

All of these process lines form a strong platform for research and innovation. They will lead to faster introduction of new equipment from Alfa Laval. Perhaps, even more important than product breakthroughs, however, is the promise of breakthroughs in approach. By working with systems instead of components, the centre can add value for shipowners, ship operators and shipyards in a wider scope, the company said.

"One of the biggest things we're exploring here is not the equipment itself, but the integration of that equipment," explained Jørgensen. "Through tighter integration of the fuel line and steam line, for example, we expect to make substantial advances in energy efficiency. And as we perfect the integrated control system, we're paving the way for a future many Alfa Laval customers want to see. When they can give us remote access to their systems, we'll have a more economical option for troubleshooting, updating software and suggesting proactive improvements."

"The Alfa Laval Test & Training Centre is not only a place where we're shaping the future, but also a place where Alfa Laval customers can experience it," he concluded.

TO

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Attitude training now firmly on the agenda

The Swedish Club is to allow all member companies, whether lead hull or P&I, to sign up to its Maritime Resource Management (MRM) course free for a period of two years.

This move, which will take effect from 1st January 2014, is part of the Club's drive to give all of its members the opportunity to have the right training procedures in place to help prevent unpredictable casualties that are so often related to human and organisational errors.

Managing director Lars Rhodin said it was all part of a determination by the Club to put safety and a strong safety culture at the forefront of the method by which its members own and manage their ships.

"This offer to our membership is a clear statement of how convinced we are about the effectiveness of our Maritime Resource Management programmes in improving the safety culture both at sea and on shore," Rhodin said.

Martin Hernqvist, The Swedish Club Academy managing director, who runs the MRM courses, said: "The positive impact on accidents and claims that we have seen from MRM successfully implemented in a shipping company is extraordinary. We want our members to experience the same development and it will be a joint effort between the Club and our membership to reach the safety targets. It will not happen overnight."

The MRM course is designed to minimise the risk of incidents by encouraging safe and responsible behaviour. It aims to foster positive attitudes, favouring good personal communication, excellence in leadership and team-working skills and compliance with operating procedures.

It is claimed to be ideal for deck and engineering officers, together with maritime pilots and shore-based personnel. The objective is to ensure that sound resource management practices underpin everyday operations.

Hernqvist concluded: "I am convinced that the initiative taken by The Swedish Club will be a major step forward in enhancing safety, not just within the Club, but in the maritime industry as a whole."

Talking with Anthony Cooray, operations manager at the Limassol office of shipmanagement concern Reederei Nord, who

is a user of the Swedish Club's MRM training offering, *Tanker Operator* was told that the company introduced this type of training some five years ago, having identified the need for such a move.

A full day's MRM training session was held this year at the Limassol office for deck and engineering officers of the company's tanker fleet.

Important issue

He explained that the company, which operates from Hamburg and Limassol, but runs its tanker division from Cyprus, has conducted annual conferences for shipboard and office management for the past six to seven years and considers MRM to be one of the most important issues in the maritime industry today.

At the last training session there were around 30 ship and 15 office staff who were by and large impressed and understood the importance of this type of training.

Cooray said that today there was a lot of knowledge and skills training undertaken in the shipping industry but very little concerning people's attitudes towards the job in hand and towards each other.

"Evaluating somebody's attitude is difficult. It most effectively undertaken by training," he said. "We are now concentrating on this element of human behaviour."

"It is not only a cultural thing, but also they bring with them certain attitudes, based on how they were brought up" he explained.

MRM tests a person's attitude, especially his, or her, assertiveness when a situation is developing for the worse with things going wrong. This type of training is connected with "getting rid of the blame culture" in a company and identifying whether a person can question actions in a positive manner and training that person to do so properly.

He said that the company had noticed much improvement in people's attitudes since the specific training started. "It has been very beneficial, we have our seafarers passing through our office regularly for briefing, debriefing and pre-promotion purposes and we



TSC Academy's Martin Hernqvist.

use this training a lot when talking with seafarers," Cooray said.

Cooray said that the formula for a person's competency was - Knowledge + skill x attitude. Without the right attitude, all the skills and knowledge a person has learned were in vain.

Like many shipowning and management companies, Reederei Nord has multi-national shipboard and office personnel, who need to blend together to attain a good working relationship. The company has employed multi-nationals for more than 20 years and it has proved to be very successful, Cooray said.

Cooray said that Reederei Nord's current crew retention rate was running at around 96%. Each vessel managed by the company has accommodation for two to three cadets – one deck, one engine and one electrical. "Most of the seniors in our fleet are ex Reederei Nord cadets, including myself. We make sure we always keep the right blend of in-house and outside experience, both in the fleet and in the office. That's why we believe MRM training is extremely important for us," he explained.

The tanker fleet, consisting of 15 vessels – two VLCCs, five Aframaxs, five Panamaxs and three chemical tankers – are managed from Limassol, while Hamburg looks after all the other vessel types in the company's fleet. **TO**

New engine room simulators for gas as fuel

“The ever increasing cost of conventional marine diesel and heavy fuel bunkers and new exhaust gas emission regulations is forcing ship operators to move to liquid gas fuelled propulsion systems,” said Graham Wagstaff, Business Development Manager Techsim, Transas Marine.

As a result, Wagstaff said that the training of marine engineers and operators in these complex new systems is essential. To meet the emerging training needs Transas has developed a new simulator platform for its technical simulators - Techsim.

He claimed that Techsim has high fidelity mathematical modelling and realistic control interfaces.

Transas is currently developing a new series of engine room and cargo handling simulators to meet emerging training needs. An entirely new LNG steam ship is in production and will be launched early in 2014.

Following this, a diesel-electric dual fuel ship will be developed ready for service mid-

2014. This development will lead to a series of LNG propelled vessels.

Traditionally, simulator training is conducted in shore based training establishments. “Why not bring training to the student?” Wagstaff asked.

The Transas Techsim platform is capable of operating on a single PC allowing training to be provided in company offices, or on board ship.

“Distance learning and on board systems can also offer a cheap, flexible and effective solution for the training and competence assessment of engineers and operators,” he concluded.

Meanwhile, Transas Marine has continued to install simulators in training facilities worldwide.

Tanker machinery

Among the latest equipment to be installed was a full mission engine room simulator at Institute of Technical Education (ITE), Singapore. With the installation of this simulator, ITE will be able to train students to operate the machinery of a MAN B&W

60MC Tanker LCC.

During this course, students will learn to perform basic maintenance of electrical equipment, align, install and repair marine machinery, maintain marine control circuits, verify measuring instruments, perform quality control and assurance, design and fabricate jigs and fixtures, inspect ship systems and machinery components, supervise work on machining systems, plus assisting to execute commissioning and testing activities.

Students, who will have accomplished the course, will receive a certificate, allowing them to advance their careers as marine supervisors and foremen (mechanical).

Wagstaff, said: “Transas has completed the installation of a full mission engine room simulator at the prestigious Singapore Institute of Technical Education (ITE). The full mission simulator will be used to teach the operation and trouble shooting of marine propulsion, auxiliary and electrical equipment. Having identified faults in the simulator, students from the Higher Marine engineering course will carry out repairs on real equipment

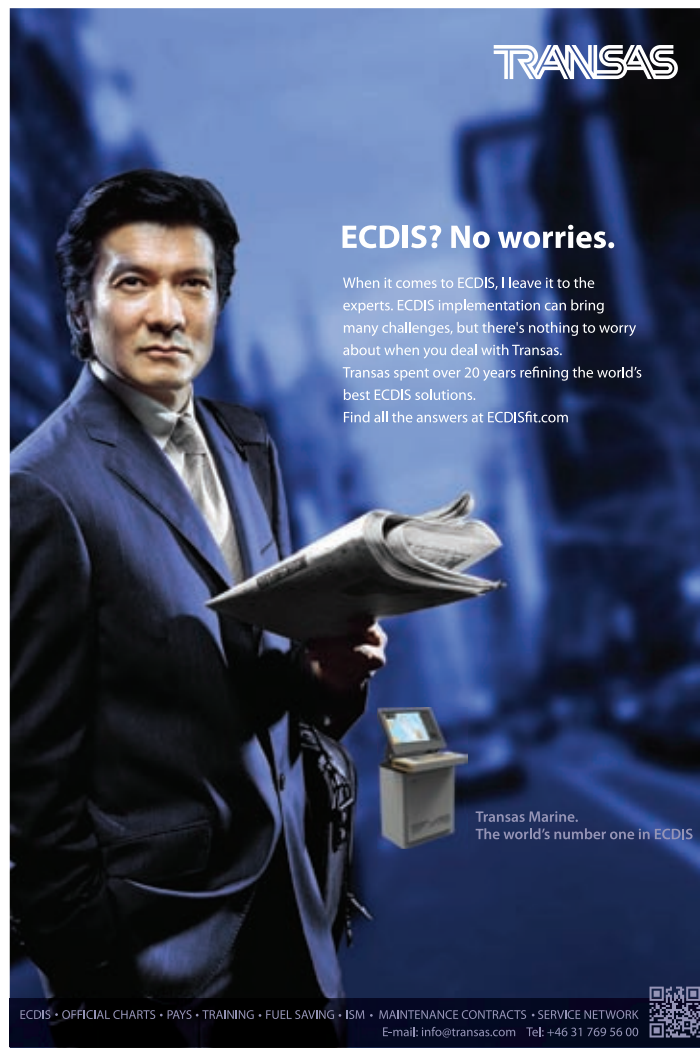


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Another installation will soon be completed at the Arabian Gulf Academy For Maritime Studies, located in Basra - the biggest Iraqi port: Transas will install an engine room simulator ERS 5000, a GMDSS simulator and a Radar/ARPA simulator.

Using ERS 5000, trainees can receive training based on a general cargo vessel model, including a general cargo propulsion and electric plant simulation. The classroom is equipped with 14 workstations.

In September, Transas helped to upgrade the NY Vaptsarov Naval Academy at Varna, Bulgaria.

The training centre was recently upgraded with the extended Transas navigational simulator NTPRO 5000, installation of a full-mission engine room simulator (ERS 5000), GMDSS class simulator, and vessel traffic management system (VTMS) simulator.

The new setup is claimed to create a ‘total ship’ environment with a real-time connection between the navigational and engine room simulators, where two main units can interact with each other during training exercises.

TO

ABS releases specialist e-Learning package for chemical tankers

ABS has launched Chem-eL, a specialist training package designed to support safety and competence in chemical tanker operations.

Chem-eL is an e-learning product developed in accordance with the requirements of the IMO’s Convention on Standards of Training, Certification and Watchkeeping for Seafarers and the relevant IMO model course.

Developed by ABS in co-operation with Malaysian Maritime Academy (ALAM), a subsidiary of the MISC, Chem-eL has been designed to enable shipowners in this highly specialised sector to optimise their training programmes for shipboard and shore-based staff.

"MISC identified a need for an e-learning program that could be used within the MISC and group company fleet, as well as for students at its own training facilities. Drawing on technical knowledge from within ABS, we were able to develop a curriculum that could additionally serve the wider industry," said ABS chief learning officer Mark McGrath

The package was made available to MISC in October 2012 for use across the fleet and at its maritime training institution to enable eight months' shipboard and shore-based testing.

David Fredrick, ALAM CEO, said; "Ensuring the required level of safety in chemical tanker operations requires a very high standard of training to support crew competence. When MISC wanted to develop a training package for use at ALAM and across the company, we knew that ABS had the technical and education expertise to support our aims and deliver a package that fulfilled our needs."

Accessible online, Chem-eL requires no specialised software installation. Course topics include an introduction to chemical tank practice, chemical and physical cargo properties, hazards and hazard control design, cargo containment and handling systems, safe working practices, pollution prevention and ballast operations.

Also covered are tank cleaning operations, risk management, the ship/shore interface, emergency, security and custody transfer aspects relating to carriage of liquid chemicals in bulk.

TO

Non-lethal anti-piracy system developed

Maritime security systems company WatchStander has developed a system designed to prevent unwanted individuals, or groups, from boarding ships.

It was developed during the past two years from US military deterrents, which have been fitted to most US navy vessels.

The system was designed to keep the attackers beyond their weapon range. “What makes our system unique is that it disrupts the attack without burdening the crew in a way that is affordable,” claimed company president David Rigsby. It has been satisfactorily tested on a number of deepsea commercial vessels over the past six months.

It comprises independent high resolution radars, which automatically identify surrounding traffic and assess their behaviour over time to identify hostile targets. Once identifying a potential threat, the system then automatically triggers non-lethal countermeasures to respond to the threat, if it continues to approach the ship.

The system is based on technology developed by the Applied Research Laboratory (ARL) at Penn State University used by the US Navy. WatchStander has an exclusive ARL license to use its patented technology.

COO marketing and capital development, Paul Slater, said that the company will use various established maritime service concerns to install the system on board ships that regularly operate through the high-risk areas (HRAs), as well as maintain and service the equipment as necessary.

Once a threat had been identified, for example a boat closing in on a vessel, the system can automatically sound the horn, switch on all of the vessel’s lights and warn the oncoming pirates that the vessel has a

detachment of armed guards on board, irrespective of whether this is the case.

In addition, 12 mill candlepower light canons, mounted up high on the vessel, preferably on the bridge wings, on military grade revolving pan/tilt platforms, will be pointed towards the oncoming boat(s) with great accuracy. These will continue to track the boat(s), no matter what manoeuvres they make, through a 360 deg arc. They are effective from 800 m to 1 km away from the vessel.

Slater explained that these methods will be used primarily to increase the pirates’ stress levels to a point where the attack is aborted, as the element of surprise will have been lost. These measures inform the pirates that they have been detected, he said. In case of mistaken identity, the Master can override the system at any time.

Threat identified

It consists of an independent radar system, which identifies a potential threat from a boat, or boats, by their behaviour. The software examines the tracks and will eliminate most of the fishing and/or pilot boats in the area. A camera is attached to the radar, which will keep focused on the target whatever the movement of the vessel being approached and in any weather condition.

If being approached by more than one boat, the camera will select the target showing the greater probability of an attack. The system has been tested on three boats approaching a vessel simultaneously with great success, the company claimed.

The system is under continuous development and more counter measures will be added as it is developed, such as the possibility of installing a laser with a ranging device and/or a compressed air gun. At present, WatchStander has a menu of deterrents from which an owner can choose, or purchase the whole package.

If carrying armed guards, they will be able to see an attack developing with the aid of a video link and the entire system’s identification process is immediately archived for dissemination. In the future, the system may be viewed on an iphone, or an android tablet device from anywhere on board ship by the security team.

The system is made up of commercial off-the-shelf equipment to keep the costs at a minimum. An alarm system will be installed in the bridge area and the company is looking into integrating it into the vessel’s AIS, although when in an HRA, it was recognised that several vessels turn their AIS off.

Slater recommended the fitting of two systems port and starboard on vessels of over 10,000 dwt to give 360 deg coverage. A third system can be installed on the stern of a vessel if deemed needed.

The synchronisation of the two port and starboard radar signals is currently being worked upon, he explained. A target can be identified in 15 seconds and five sweeps of the radar will normally build up a track and three sweeps will analyse the track. It has a detection range of 40 km and pirates will know they are being tracked at around 5 km range.

A customer will buy the equipment and pay a license fee. WatchStander will provide the software and the updates. This could equate to a one off payment of \$50,000, plus installation costs and \$5,000 for the upgrades.

Slater claimed that this was a cheap option when compared with armed guards, which could cost around \$130,000 per trip through an HRA, plus the kidnap and ransom insurance.

“

...these methods will be used primarily to increase the pirates’ stress levels to a point where the attack is aborted, as the element of surprise will have been lost.

”

Wärtsilä claims the lead in dual fuel technology

Wärtsilä has successfully conducted full scale testing of its low-speed 2-stroke dual-fuel engine running on gas at the Wärtsilä Italia diesel engine manufacturing plant, based at Trieste.

The company has now embarked upon the introduction of a full range of engines based on this established and well-proven low pressure technology.

At a presentation at the Trieste factory, Wärtsilä claimed that the implications of this new technology for shipowners and operators are such that the new engine is already being referred to as a game-changer for merchant shipping.

The first engine to use this technology, the Wärtsilä RT-flex50DF, will be available for delivery in the third quarter of 2014. Other engines from the company's new generation X-series will be available for delivery during 2015 and 2016, resulting in the entire portfolio of Wärtsilä 2-stroke engines being available as low pressure dual-fuel (DF) versions.

On the test bed, the engine originally had just one cylinder converted for gas operation, but since August of this year, the whole engine has been running on gas as well as diesel oil.

Wärtsilä's Director Dual-Fuel Technology, Ship Power, 2-stroke, Ingemar Nyland, said that company was still working on reducing the methane slip.

The benefits of this technology are significant, Wärtsilä said. Compared to other technologies, studies showed that Wärtsilä's low pressure DF engines offer capital expenditure (CAPEX) reductions of around 15-20%.

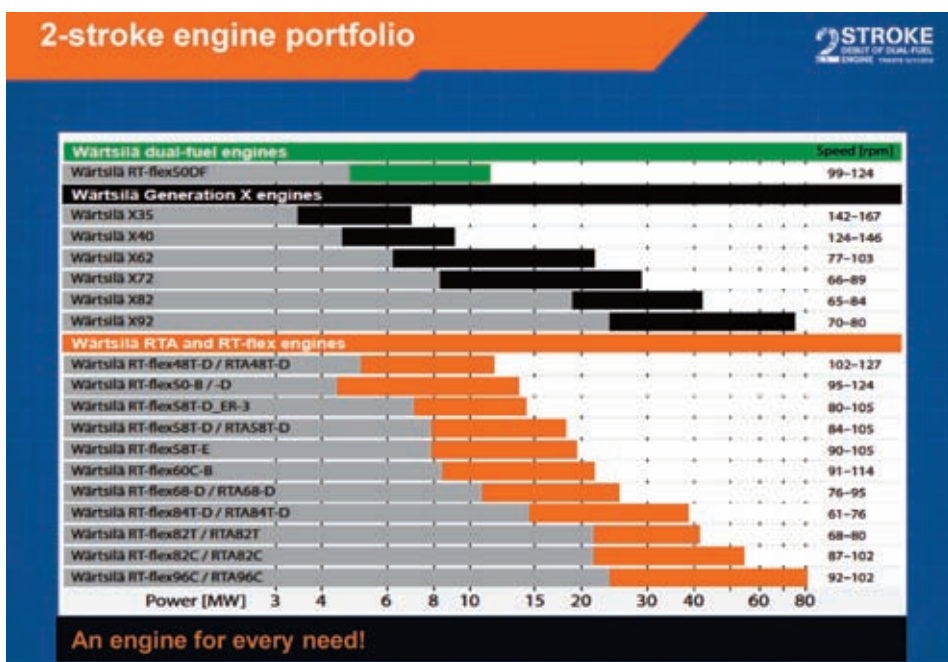
This is achieved through a much simpler and lower cost LNG and gas handling system, operating at pressures below 10 bar. No further exhaust gas cleaning systems are needed to meet future emission regulations, the company claimed. The new engines are IMO Tier III emissions compliant in gas mode and the minimum Tier II level is achieved with liquid fuel.

Furthermore, as for operating expenditure (OPEX), significant gains will be achieved with Wärtsilä's technology, due to not needing to operate a high pressure gas compression

system external to the engine on board the vessel. In addition, NOx abatement systems are not required.

Another main advantage claimed is that Wärtsilä's technology allows stable operation on gas across the entire load range. This means that at low loads, there is no need to switch to diesel fuel, as is the case with other technologies. Moreover, the consumption of pilot fuel is about 1% of the total fuel amount and therefore much lower than with other technologies. The company also claimed that its lean burn combustion system was unique.

From operating in gas mode, the engine can be switched back to diesel fuel in just one revolution while the engine load is not affected, as it continues to run throughout the switching procedure. The engine is also capable of idling in gas mode. The switching system is fully automatic and contains all the necessary safety checks. Indeed, Wärtsilä's low pressure gas system fulfils all safety requirements, the company said. Since low



Wärtsilä's Ingemar Nyland.



Wärtsilä's Martin Wernli.

pressure gas technology is the standard for all 4-stroke engine manufacturers today, the merit of this concept is already proven.

The engine's combustion monitoring system's information can be relayed back to the shoreside office where condition-based monitoring can be undertaken. The company claimed that the methane number- normally around No. 70-90 – does not need monitoring.

"The benefits of the new low pressure dual-fuel technology for 2-stroke engines are significant. Describing this as a game-changing development for merchant shipping is certainly no exaggeration, since the many advantages of being able to use gas and LNG as primary fuel are now, for the first time ever, available to virtually all vessel types.

"Our well proven technologies for both the engines and the on board gas and LNG handling systems, can now be applied to this wider market. With the adaption of low pressure dual-fuel technology to 2-stroke engines, Wärtsilä brings the proven

Wärtsilä RT-flex timeline

Type	Delivery
Wärtsilä RT-flex50DF	Q2 2014
Wärtsilä X62DF	Q1 2015
Wärtsilä X72DF	Q3 2015
Wärtsilä X82DF	Q1 2016

advantages it has demonstrated in the 4-stroke, medium-speed DF engine market to its 2-stroke low speed engine customers," said Martin Wernli, Vice President, 2-stroke, Wärtsilä Ship Power.

Wärtsilä claimed that it had pioneered the development of dual-fuel engine technology and said that today, it is the industry leader in this field. Throughout the years, Wärtsilä's R&D work has focused heavily on these technologies. The company introduced its low pressure dual-fuel engine technology for 4-stroke engines for land-based applications in the 1990s and for marine applications soon afterwards. Since then, the company has delivered more than 1,000 dual-fuel engines accumulating more than 7 mill running hours.

The application of natural gas as a widely accepted fuel for merchant shipping was likely to become a reality in the near future, the company forecast. The environmental benefits and attractive pricing that gas offers were expected to drive demand, with a resulting increase in market share for gas fuel. Wärtsilä said it envisaged that by 2020, more than a quarter of the ordered vessels could be designed to run on gas fuel.

Wärtsilä is currently in the process of finalising the documentation for the first of the new series of engines - the Wärtsilä RT-flex50DF. Preparations for classification society approvals are currently underway.

First orders announced

The first installations of the RT-flex50DF engines will be on board two newbuilding 15,000 dwt product tankers for Terntank Rederi, the Danish-based tanker operator.

The selection of the Wärtsilä RT-flex50DF engine is a central feature of Terntank's 'Into the future - Baltic SO2lution' project, which is in response to the European Commission's TEN-T call 2013 whereby "Motorways of the sea actions" are identified to promote the sustainability and safety of transport, and to improve either existing or new maritime links.

The project supports the development of more environmentally sustainable and energy efficient shipping in the Baltic Sea region and the building of an LNG infrastructure. Since the Baltic Sea is a designated ECA, the use of LNG as fuel is seen as being an effective means of attaining cost-efficient regulatory compliance.

"These newbuild tankers will be among the world's most environmentally sustainable ships, and we are very proud of this. With the Wärtsilä engine technology they are Tier III compliant in gas mode, which of course means that we can operate in the Baltic Sea ECA without restrictions.

"Moreover, we expect considerable fuel cost savings. Conventional product tankers of this size have an average bunker consumption of 22 to 25 tonnes per day. With these newbuildings we expect daily bunker consumption of just 14 tonnes," said Tryggve Möller, Terntank Rederi board member. ■

A multi-product plant

Wärtsilä Italia's history dates back to the early 1970s when under the banner of Grande Motori Trieste (GMT) is started to design and manufacture 2-and 4-stroke diesel engines.

In 1997, Wärtsilä Corp became a shareholder in GMT and two years later, the Trieste concern became a wholly-owned member of the Finnish-based group.

Today, the Trieste plant develops, manufactures, sells and provides service solutions, for a wide range of medium speed engines with outputs from 1.9 MW to 23 MW. During the past decade a lot of investment has

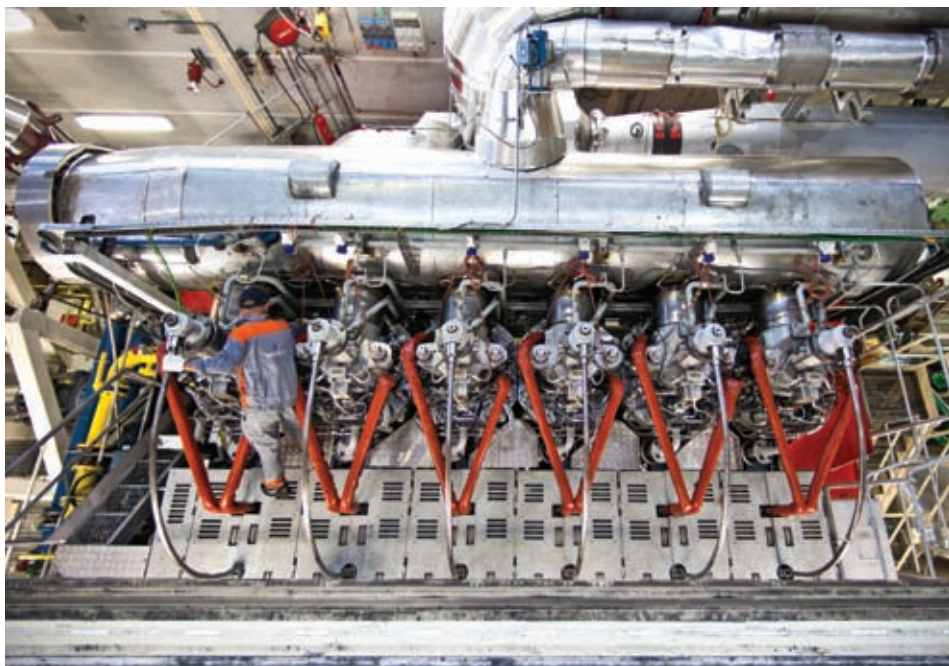
been made in modernising the plant to increase efficiency and turn it into a multi-product factory. In addition, the factory's capacity has been increased for both engine production and testing.

Under the name of 'delivery centre Trieste (DCT)' today the plant produces 4-stroke engines in the Wärtsilä 26, 38, 46, 46F, 50DF and 50SG families, as well as propulsion products, which started in 2010 with the production of Lips modular thruster (LMT). The product offering was recently expanded to include the new LMT 3510 and this year was further expanded to include gear boxes and controllable pitch propellers.

The plant has a total area of 550,000 sq m,

of which 155,000 sq m is under cover. Wärtsilä Italia currently employs around 1,400 people, located in Trieste and Milan, plus the service centres in Genoa, Naples and Taranto. In addition, the subsidiary looks after the major local shipowners and shipyards and other clients based in Malta, Monaco and the Balkan countries.

Other areas of expertise include 4-stroke engine project management and solution engineering worldwide, gas fuel systems' sales and product engineering, engineering support for the production of propulsion systems, in addition to product engineering for propulsion control systems. ■



An RTflex50DF seen on the test bed.

Rolf Stiefel, Director Wärtsilä Ship Power, 2-stroke sales said that he is in discussions with shipowners, based in the Baltic countries, many of which operate their vessels in the Baltic and North Sea - both ECA areas. He

also claimed that the X50DF type is ideal for the Handysize tanker market.

He said that to retrofit an engine to operate on gas, as well as fuel oil was relatively easy, but to retrofit a vessel was more



Wärtsilä's Rolf Stiefel.

difficult due to the space/location needed for the gas tanks and the relevant connecting piping, etc. For the fitting of DF engines on board oil tankers and gas carriers, deck space is usually available for the tanks to be fitted., Stiefel said.

For the tanker segment, within Wärtsilä's engine portfolio the new W-X40 was said to be suitable for product tankers, the W-X62/X72 types were ideal for Aframaxes and Suezmaxes, while the larger W-X82 is suitable for VLCCs, Wernli said in his presentation. **TO**

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AWT unveils fleet decision support system

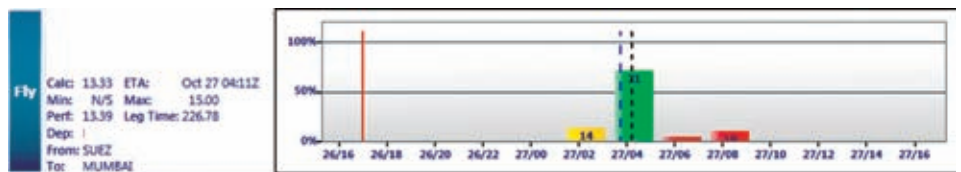
Fleet optimisation services and on board voyage management software provider Applied Weather Technology (AWT) has introduced the latest version of its fleet management system - Fleet Decision Support System (FleetDSS) 2.0.

This updated version is now available for use within a company's IT network and comes with new tools, including an ETA confidence tool and a comparative vessel type performance graph.

"At AWT, we are committed to meeting the diverse needs of all sectors of the shipping industry," said Haydn Jones, AWT CEO. "With the launch of FleetDSS 2.0, we believe AWT has developed an invaluable tool that will help companies be more efficient in managing their fleets while minimising fuel consumption and improving safety."

FleetDSS 2.0 includes high-resolution wind, wave and current data to provide operators with more detailed information. The latest version also includes specific information about swell conditions following customer feedback and combined with other parameters, provides detailed information on how ships will be affected by the weather and currents.

Version 2.0 is a network version, which means it can now be set up to collect the



The ETA confidence tool evaluates the likelihood of a vessel arriving at the projected time.

weather and route data at one central location and multiple users can access this data. For clients with many users, this will significantly reduce the amount of data being downloaded while providing quick access to the data they need.

Fleet efficiency

The ETA confidence tool analyses 20 model outputs to predict the likelihood that a ship will arrive at the projected time. Operators can use this tool to evaluate the confidence in a vessel's ETA and the likelihood of the vessel having an earlier, or later, arrival in order to make more informed decisions.

In addition, FleetDSS 2.0 provides a

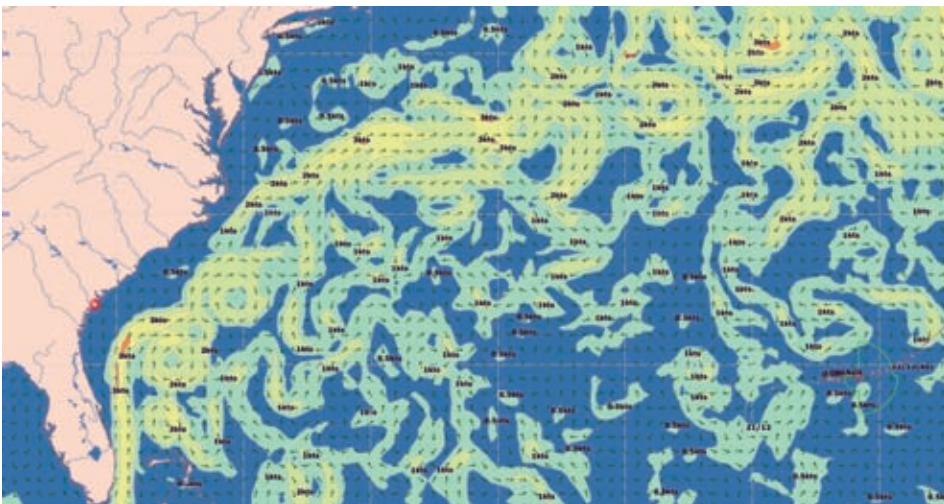
graphical tool comparing performance across a group, or class, of ships to help shipmanagers monitor the efficiency of their fleets. Using this tool, operators can compare their ship's performance with other ships of the same type. This helps operators more easily see if a ship is under-performing and may have an issue that needs to be addressed.

Charterers

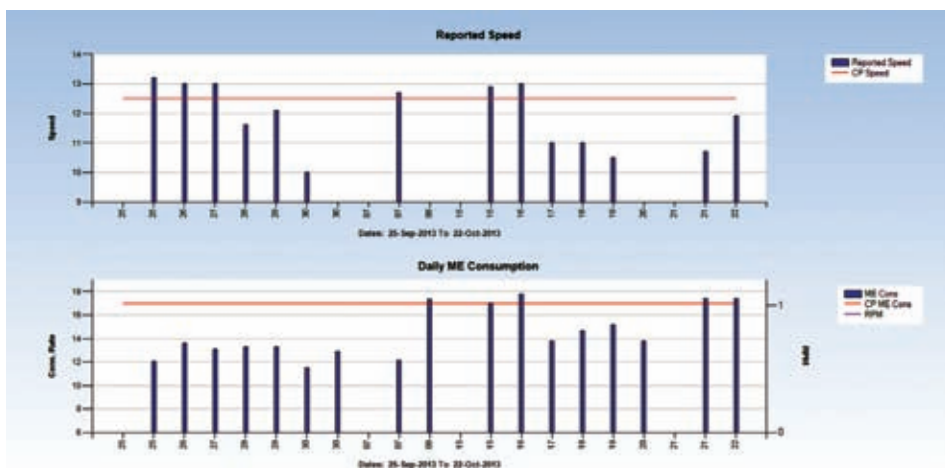
With version 2.0, ship operators can easily assess how each vessel is performing compared to their specific charterparty terms, AWT claimed. Operators can access this data using the fleet performance report, or monitor vessels that are under-performing using the alert dashboard.

"The original version of FleetDSS was very useful for liner companies, but now with version 2.0, we have expanded the capabilities of FleetDSS to cover a wide spectrum of the market," said Rich Brown, AWT's vice president of products and systems. "In FleetDSS 2.0, the new tools allow ship operators to be more efficient and make better decisions."

Simultaneously, AWT launched a voyage calculator program. This software is claimed to accurately calculate the distance, speed loss and corresponding cost of a voyage from one port to another, taking into account weather, ocean currents, hire rate and other factors, giving the user multiple options. For example, AWT has access to weather data from over



The North Atlantic currents can be accessed.



Performance comparison graphics.

3,000 ports worldwide. ECA zones can also be taken into account by calculating the distance needed to travel through an ECA and the extra costs involved from taking on low sulphur fuel.

“Shipbrokers and charterers need voyage time and distance estimates to project costs, but simply using great circle distances can give unrealistic, or misleading predictions,” said AWT vice president operations George Schlinkert. “Voyage Calculator delivers more reliable information based on AWT’s experience routing thousands of vessels each month and our analysis of a decade’s worth of weather data. The improved precision can result in substantial savings, making Voyage Calculator an essential tool for anyone involved in commercial ship operations.”

It delivers a voyage cost estimate in terms of charter time and fuel consumption. In addition to the weather and ocean current information that yields expected speed loss via AWT’s proprietary Climatological Ship

Resistance (CSR) model, Voyage Calculator can account for different fuels and rates of consumption, as necessary.

It can also factor in ECAs and piracy considerations, such as entering a War Risk and/or a High Risk Area (HRA), as it sets a route. Users can access the web-based program and set voyage parameters, the results of which can then be viewed through a full-colour online map interface.

Jones told *Tanker Operator* that since becoming AWT’s CEO at the beginning of this year, he has conducted a strategic company review by looking in as an outsider.

He found that the drivers for change to the company’s weather routing offering were threefold.

First was the high bunker fuel cost, combined with continuing low charter rates almost across the board, coupled with the IMO’s focus on energy efficiency and the environment, which led to the stronger demand for fuel efficiency.

Looking at the wider picture, Jones found that there were around 20 parameters defined by the IMO and shipping companies for voyage planning and routing to add to the list of ship efficiency concerns.

Second was the mandatory introduction of ECDIS in 2018 to replace paper charts. Jones said that weather routing systems should be seamlessly integrated into a totally integrated navigation system.

Today, a navigator will have to manually monitor a weather routing system on the bridge in addition to viewing all the other navaids. He said that there should be a drive to integrate weather routing into a vessel’s voyage planning software tools.

Indeed, AWT is already proving its compatibility with Kelvin Hughes and ChartCo’s navaids software - Jones’ former employers. In addition, the company is working with UKHO’s e-Navigator system and with a leading bridge equipment supplier.

The third consideration was the rise of broadband and VSAT uptake, giving the opportunity for high density communications flow from shore to ship and also data from ship to shore. Hence the need to improve data reporting, resulting in FleetDSS, Jones explained. The old system of noon reporting was not an adequate solution in today’s move towards ships efficiency.

He said that the way ahead was for AWT to build collaborative agreements with other software suppliers on board ship to improve the data flow between the vessel and the shoreside office and develop the tools needed for the shared information in order to aid a vessel’s performance and gain greater operational efficiency.

TO

AWT’s BVS integrates with UKHO’s e-Navigator

As an illustration of Jones’ move towards greater collaboration with other major players, AWT and UKHO have jointly introduced the capability of interchanging track waypoints between the ADMIRALTY e-Navigator and AWT’s Bon Voyage System (BVS).

“At AWT, we are committed to helping our clients attain both time efficiency and fuel efficiency,” said Jones. “The seamless integration of the track transfer between BVS and e-Navigator will help captains find the most efficient route while making the passage planning process easier and less time consuming.”

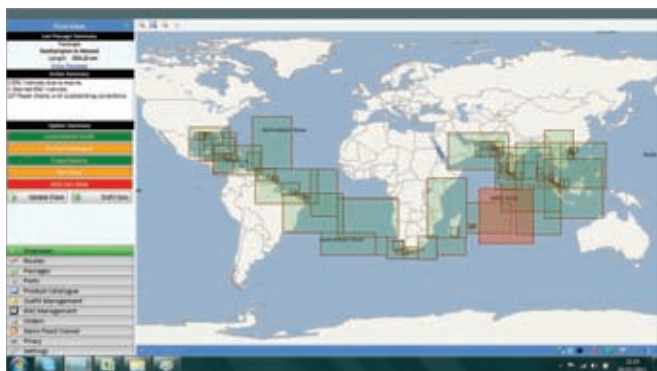
This new capability is intended to make passage planning much easier. Users can now employ the BVS system to optimise a voyage based on weather constraints to find the most efficient and safe route, then display the track in e-Navigator to validate that a vessel has all the required up-to-date charts and nautical publications on board. Once the track has been processed in e-Navigator, it can be passed to the on board ECDIS system to confirm that the track is navigationally safe.

Nick Hyam, senior product manager for ADMIRALTY e-Navigator said, “The UKHO is pleased to be working with AWT, the acknowledged leader in voyage management software, to provide the navigator with a seamless voyage planning and route

optimisation solution which delivers real benefits in terms of cost and time saving.”

ADMIRALTY e-Navigator is a PC application that organises, updates and brings together all of the paper and digital information needed to plan safe voyages and simplify essential tasks. Whether located on the bridge, or shoreside, e-Navigator will not only give access to a wealth of information, it will also organise, maintain and display all of that data, enabling bridge and office-based teams to have instant access to all the navigational information they need at all times worldwide.

BVS is an icon-driven graphical marine voyage optimisation system that provides on board and 24/7 weather-routing information. ■



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Decision support tools should be used

The International Regulations for Preventing Collisions at sea 1972 (COLREGS) have no reference to AIS but only to radar.

Consequently, many navigators are under the impression that AIS information should not be used for collision avoidance, US-based Totem ECDIS said.

This attitude is heard from many officers and Masters, possibly coming from wrong interpretation of the rules by some marine schools. Totem has stressed that AIS information should be used for collision avoidance.

Anybody who is familiar with the COLREGS will counter the opposing reasoning above and will immediately quote rule 7(a), which says 'Every vessel shall use all available means appropriate' and consequently AIS should be used if available. However, seafarers are not supposed to be legal experts and should not be in a position where interpretations should be applied.

In order to further understand this issue, one must go back to the original guidelines given by IMO on 'Use of AIS in Collision Avoidance Situations'. These guidelines are part of IMO Resolution A.917 (22), adopted on 29th November 2001. These guidelines, incidentally, are set to be revised by IMO in 2014.

Reading the guidelines, the text is indeed self-explanatory, Totem said. The guidelines state that 'AIS is an additional source of navigational information' and further that 'AIS

Since the introduction of AIS in 2001, the question of 'how to use AIS data on board' is still unclear.

can assist in tracking it {a detected ship} as a target'.

Combining the above with the COLREGS requirement that the officer of the watch (OOW) should use 'all available means', it is a clear indication that IMO intended the AIS to be used to avoid collisions.

However, a word of caution should be included, Totem said - the guidelines also warn that the seafarer should not rely on AIS alone and should not use the AIS as an excuse to slacken his, or her lookout, or responsibility.

This statement agrees fully with COLREGS requirements for good seamanship and proper lookout. Totem stressed that, in interpreting AIS data by ECDIS systems, the good practice is to use the target positions only and not trust the SOG (speed over ground) and COG (course over ground) computed and sent by the target's AIS transmitter. Those parameters are calculated separately using the Kalman algorithm, as is customary with ARPA systems.

Decision Support

Item 40 of the AIS guidelines state that 'AIS information may be used to assist in collision

avoidance decision making'. Totem ECDIS claimed that it provides unique decision support tools.

Such tools give the OOW the suggested course of action, either the exact course change, or the exact speed change that is advised in order to avoid collision. With the decision support tools, the decision making process becomes more methodical and the right decision is more often taken, the company said.

Totem ECDIS complies with all the above IMO guidelines, in particular with items 40.1, 41 and 43, and is fully compatible with COLREGS. It is important to emphasise that, complying with IMO guidelines, the decision support tools are based on both AIS and ARPA information, the company said.

Decision support tools are already used for other aspects of navigation, notably for grounding avoidance and route planning. The attitude that was initially noticed with some navigators, namely "we know the rules of the road, we don't need the machine to tell us what to do" is sometimes apparent. But if everybody knows the rules, why are there so many collisions?

The answer is possibly more and better training, better education and better performance monitoring. Totem ECDIS said that it offered, in addition to the above, advanced decision support tools that can improve safety and provide the ability to avoid dangerous situations.

TO



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From paper charts to ECDIS

Advice and practical assistance to help with the extra risks posed by the transition from navigating by paper charts to using an ECDIS are given in a new book published by The Nautical Institute (NI).

The second edition of *From Paper Charts to ECDIS** offers practical guidance on equipment, training and operational practices. In the four years since the publication of the first edition, members of NI's 'sea going correspondence group (SGCG)' have gained additional experience of using ECDIS and that has been assessed and distilled into this latest volume.

Author Captain Harry Gale FNI said: "As well as supporting its members through this fundamental change, The Nautical Institute wants to ensure that the best practice

encapsulated in this second edition, incorporating experience at sea, reaches as wide an audience as possible throughout the industry. Bridge procedures have to be amended to accommodate the very different working practices needed for using ECDIS and failure to instigate the discipline of being alert and engaged when using ECDIS may lead to distraction, complacency and ultimately accidents."

Speaking at the launch, the NI's CEO, Philip Wake FNI, described the second edition as timely. "When we brought out the first edition four years ago, the industry was just beginning to realise that it needed to provide training for crews in the lead-up to the mandatory introduction of ECDIS. The members of our SGCG have helped us offer

practical strategies for those who are faced with dealing with the transition from paper charts to ECDIS."

He pointed out the scope of the Institute's work to support those involved in this transition. "Many of you will be familiar with Dr Andy Norris's book *ECDIS and Positioning*. The checklists in that book have provided the substantive element of the industry's recommendations for ECDIS training and familiarisation."

These recommendations were drawn up by a group co-ordinated by the NI and are included as appendices to the second edition of the latest book.

He expressed the hope that the book would take people right through to 2018 and that by then everyone would have got their training right, especially in support of experienced mariners who trained originally on paper charts. **TO**

“...The Nautical Institute wants to ensure that the best practice encapsulated in this second edition...”

Captain Harry Gale FNI, Author

”

**From Paper Charts to ECDIS is available from The Nautical Institute price: £20; ISBN: 978 1 906915 17 9 <http://www.nautinst.org/pubs>*

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Will the rush to fit systems induce scrapping?

Shipowners have been facing an environment of increasing operating costs. Rising fuel prices, low sulphur fuel requirements, port fees and special surveys are just some of the issues that must be considered in financial planning.

As we look to the future, the treatment of ballast water is also on the horizon. The IMO developed the International Convention for the Control and Management of Ships Ballast Water and Sediments 2004 to protect the marine environment from the transfer of invasive aquatic organisms in a ship's ballast water.

The convention will come into effect 12 months after countries representing a combined total gross tonnage of more than 35% of the world's merchant fleet have ratified the convention. As of 21st June, 2013, some 37 countries representing about 30% of the world's merchant fleet tonnage have ratified the convention.

Industry participants have said that ratification will occur in the "near future" although there is still no consensus of the timing, McQuilling said.

In the US, the United States Coast Guard's Final Rule on Ballast Water Management entered into force in June 2012, applying to ballast water discharge in US waters (see Table 1).

McQuilling Services looks to the future in an industry note on the subject of ballast water treatment.*

This regulation requires ships entering US waters to perform a ballast water exchange at least 200 miles offshore. This is referred to as a D1 requirement.

A stricter US requirement is the D2 that calls for the installation and use of a ballast water treatment system (BWTS). Any ship built after 1st December, 2013 will be required to have D2 equipment on board, while vessels built prior to that date will be required to install BWTS equipment no later than their first drydocking after 1st January, 2016.

In addition, the US Environmental Protection Agency (EPA) issued the Vessel General Permit (VGP) regulating discharges from commercial vessels, including ballast water, to protect the nation's water from shipborne pollutants and invasive species.

Although the VGP generally aligns with the USCG ballast water requirements, it contains some additional requirements concerning the functionality, calibration, and sampling

processes involved with the BWTS, McQuilling explained.

Price estimates for BWTS systems range from \$500,000 to \$3 mill, rising in line with the ship's size. Technical advances are supporting lower prices.

'Wait and see'

Owners seem to have adopted the 'wait and see' approach in the absence of a specific implementation date. This could result in extensions, or waivers, as it seems unlikely that the global fleet could reach compliance in one year.

In the current market environment, an owner's willingness and financial capacity to invest in new systems is debatable. Some owners will likely scrap their vessels rather than undergo the special survey and install costly equipment, McQuilling said.

This could provide a limited boost to trimming the trading fleet, as owners of 15-year old plus vessels will see additional costs on the horizon.

However, as illustrated in Figure 1, the bulk of the merchant fleet was delivered post 2000. This implies that even if scrapping were to accelerate on ships 15-years and older, a severe acceleration would be needed to significantly

	Vessel's Ballast Water Capacity	Date Constructed	Vessel's Compliance Date
New Vessels		After December 1, 2013	On delivery
Existing Vessels	Less than 1,500 m3	Before December 1, 2013	First scheduled drydocking after January 1, 2016
	1,500-5,000 m3	Before December 1, 2013	First scheduled drydocking after January 1, 2014
	Greater than 5,000 m3	Before December 1, 2013	First scheduled drydocking after January 1, 2016

Table 1: USCG and EPA Ballast Water Treatment Requirements & Implementation. Source: US Coast Guard and Environmental Protection Agency.

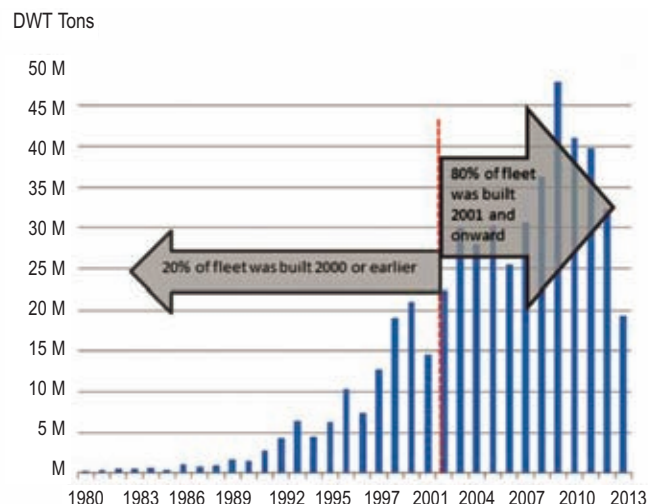


Figure 1: Merchant Fleet DWT by Build Year. Source: P66 Strategy Team.

reduce tonnage, due to BWTS regulations. Ultimately, the pace of scrapping relating to BWTS will be directed by the time frame of ratification, or enforcement, McQuilling said.

There are three types of technologies that are developing around BWTS - mechanical, physical and chemical, which have various options and are briefly described below.

1) Mechanical can use a filtration system to remove sediment and particles during ballast water intake. A cyclonic system separates solid particles from the water with centrifugal force.

However, with this system, only matter with a specific gravity above water will be removed. Electro-mechanical separation injects a flocculent that will attach to organisms and sediment. Magnetic separation and filtration is then used to remove the solid particles.

2) Physical disinfection has three options as well. First, Ultra Violet light can be used to break down cell membranes killing the organism or destroying its ability to reproduce.

Effectiveness depends on ballast water turbidity (sediment concentration) as this could limit transmission.

Second, cavitation/ultrasounds – venturi pipes or slit plates are used to generate cavitation bubbles. These high energy bubbles

create hydrodynamic forces, ultrasonic oscillations, or high frequency noise, which kills organisms.

Third, de-oxygenation uses various methods to remove the dissolved oxygen in the ballast water and replace it with inactive gases, such as nitrogen or other inert gas. In addition to killing aerobic organisms this can help prevent corrosion if the oxygen content is maintained at the correct levels.

3) Chemical systems can use disinfecting biocides. These are pre-prepared disinfectants designed to be dosed into the ballast flow and kill the living organisms. Typical biocides include chlorine, chloride ions, chlorine dioxide, sodium hypochlorite and ozone. Second is electrolytic chlorination, applying an electrical current directly to the ballast water flow in an electrolytic chamber.

Many systems

There are 28 unique systems alone in the above categories. However, none have been cleared by all the governing bodies.

Naturally, there are differences between the systems for issues, such as application installation, sizing flexibility, holding time and power requirements to run effectively.

Safety considerations are also an issue. The treatment technology also needs to take into consideration the actual ballast water. The organic content of ballast water varies regionally. Therefore threats posed to local eco systems can vary greatly, requiring varied treatment system capacities.

There are other issues to be considered. If a quick implementation would be required, it is unclear that global shiprepair capacity would be adequate. This could be compounded by the current wait and see approach. Challenges will also surface from divergences in ballast systems, pumps and piping.

As 2014 is fast approaching and the tanker market remains pressured by tonnage supply and orderbooks in some sectors remain high, yet another factor impacting profits is on the horizon.

Although this might not be the impetus required to significantly reduce tonnage, it could help nudge some owners in the right direction, McQuilling concluded.

TO

**This note was provided by P66, based on research from the P66 Strategy Team with technical guidance from tanker owner Minerva Marine, McQuilling acknowledged.*

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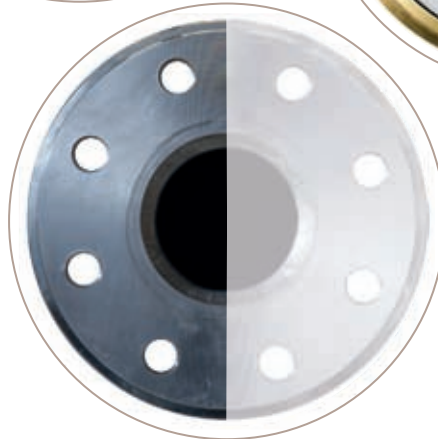
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USCG AMS acceptance gains ground

The US Coast Guard is leading the way with ballast water treatment system (BWTS) regulations and has agreed to issue an ‘Alternate Management Systems (AMS)’ certification ahead of the ratification of the IMO’s convention.

By 15th November, some 24 companies had received the certification, meaning that the vessels, on which the systems are fitted, can trade in US waters (see Table on page 38).

Among the latest companies to receive AMS approval was **DESMI Ocean Guard**.

The company’s OxyClean system was granted approval on 11th October for models from 75 cu m capacity to 3,000 cu m per hour.

The AMS acceptance covers all salinities, ranging from freshwater to marine water. This was the first time the USCG had released an AMS acceptance that covers all salinities, as the previously released acceptances were valid in only marine and brackish water and not for freshwater, the company claimed.

DESMI Ocean Guard CEO, Rasmus Folsø, said: “We are extremely pleased to be the first in the world to receive the USCG AMS acceptance in all salinities. This proves that all the hard work and challenges associated with having our OxyClean system specifically designed and approved for use also in fresh water was worthwhile.

“Since the very beginning of the development of the OxyClean system, we have been focused on developing a system that will work in all salinities. The reason for this is that freshwater conditions are much more commonly encountered than people tend to think.

“Many of the world’s largest ports are located in river estuaries and often the water here is freshwater. Examples are Shanghai, Rotterdam, Bremerhaven and Hamburg just to mention a few. If a vessel takes on ballast water in such a freshwater harbour it will not be allowed to discharge the ballast water to the sea in US territory, unless it has a ballast water treatment system on board, which is approved by the USCG for use in fresh water.

“The USCG AMS acceptance is an interim acceptance that is valid five years after the date where a given vessel must be equipped with a USCG approved BWTS. These dates are defined in the USCG Final Rule regarding discharge of ballast water, which entered into force in June 2012.

“DESMI Ocean Guard is already working on obtaining a full USCG type approval for the OxyClean system. In addition, our new RayClean system has been tested in all three

salinity ranges and all testing has been done according to both IMO guidelines and USCG requirements and under the supervision of DNV, which is a USCG recognised Independent Lab. This means we expect USCG type approval for the RayClean system once the USCG starts issuing type approvals for BWTS,” he explained.

On the same day, Greek manufacturer **Erma First** received its acceptance letter from USCG.



An Erma First medium capacity system.

Approval was given to the company's models from 50 cu m capacity to 3,000 cu m per hour, plus the associated filter housings, as type approved by the Hellenic Republic, Ministry of Development, Competitiveness & Shipping, Merchant Ships Inspection General Directorate, design and Construction Directorate issued on 10th May, 2012.

Erma First's BWTS was tested on land and on board ship in accordance with US Standards.

The most challenging water conditions' test, such as natural richness and density of organisms, high particle and sediment load, were performed at NIOZ as per IMO G8 guidelines and the results were successful.

Managing director Konstantinos Stampedakis told *Tanker Operator* that the company was working on the design for installation in hazardous areas. The certification is expected by the spring of next year.

He explained that Erma First's BWTS is suitable for ballast pump capacities up to 1,500 cu m per hour. Although by the summer of 2014, the company will launch a high capacity system with flow rates of up to 3,000 cu m per hour. "Currently, we are in the certification stage of this version," he said.

He also said that the company had signed more than 40 contracts to supply the system. Seven systems have been delivered while the rest will be fitted in 2014.

"We have seen our order book increase rapidly the last three months. With the receipt of the AMS designation from USCG, we expect our order book to reach more than 100 contracts within the following year. Our contracted system capacities vary from 100 cu m per hour up to 900 cu m per hour," Stampedakis said.

He said that the main selling point of the company's BWTS is that the electrolytic system incorporates an advanced separation stage based on hydrocyclones.

This separation stage of the system is a unique stable operation method, achieving extreme sediment removal. There is no risk of clogging.

"Its excellent design offers to the user minimal maintenance costs, since it consists of no moving parts and thus requires no spare parts. The system has been designed to offer low energy consumption in order to reduce environmental impact and it has been carefully designed for easy installment," he said.

On 11th November this year, the BallastMaster ultraV developed by GEA

Westfalia Separator Group was awarded an AMS certificate.

The US has implemented its own regulations independently of the existing IMO regulations for the treatment of ballast water via the USCG's 'Vessel General Permit' (VGP) in 2012.

The regulations of the USCG are applicable for all new vessels whose keels were laid down after 1st December, 2013. Existing vessels with keels laid down before 1st December 2013 and with a ballast water capacity of 1,500 to 5,000 cu m per hour must comply with the US regulations after their first scheduled docking from 1st January, 2014.

For existing vessels with a ballast water capacity of less than 1,500 cu m per hour and more than 5,000 cu m per hour, this is applicable after the first docking after 1st January 2016, GEA Westfalia explained.

BallastMaster ultraV is claimed to be an extremely efficient mechanical and physical system solution for treating ballast water, including ballast water with high concentrations of organisms and sediment particles.

The two-stage system works with mechanical pre-filtration and subsequent disinfection of the ballast water by means of

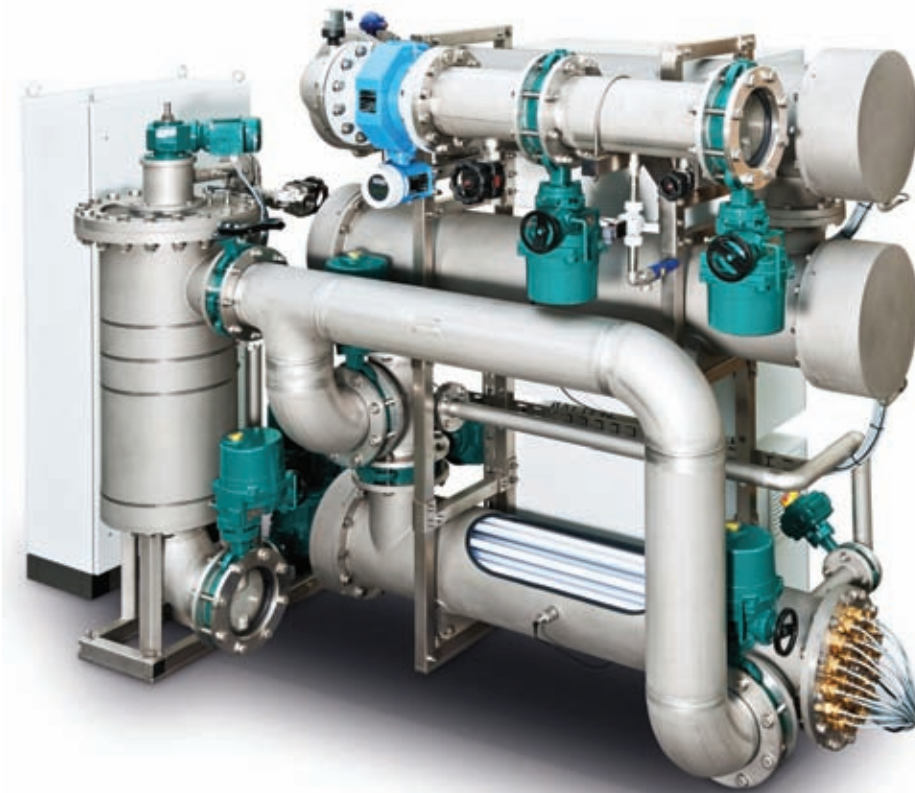
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In the first stage, an upstream mechanical filtration system removes all organisms and sedimentary particles larger than 20 microns. This reliably prevents sedimentary deposits from accumulating in the ballast water tanks, as well as guaranteeing in the second stage an optimum result for ballast water disinfecting. The filter modules are cleaned automatically by vacuum extraction (self-cleaning), the company said.

In the second stage, the pre-filtered ballast water is disinfected by UV-C radiation. The monochromatic UV-C radiation (254 nm) effectively destroys organisms, such as bacteria or phytoplankton.

A microcavitation technology effected by ultrasonic ensures that the biofilms and inorganic deposits on the cladding of the UV-C tubes are cleaned off extremely efficiently and permanently.

The combination of short-wave UV-C radiation and ultrasound cleaning of the radiation units ensures effective disinfection of constant quality in line with the regulations and thus ensures that all port controls are passed without any problems.

It received type approval in accordance with the IMO in 2011.

On 29th August, Norwegian-based **MMC**

Green Technology gained the USCG AMS and won orders for retrofit projects

With 28 systems sold to date and a breakthrough on the market for installation on board offshore vessels in operation, MMC claimed success with the system developed for treatment of ballast water on board smaller vessels.

"We were granted DnV type approval for our system in December 2012. Since then, we have sold 28 systems," confirmed director of sales and marketing Børge Gjølseth.

He said that he believed the company's success was due to a combination being the smallest system on the market, which takes up the least space on board and that the system had a simple structure and was easy to operate.

"So far, we have primarily sold our ballast water management system to shipyards which in turn install the system on board newbuilds. However, we have now also sold three systems to offshore vessels in existing fleets, a process known as retrofit," explained Gjølseth.

MMC Green Technology is a relatively young company and is currently working on building a network of agents worldwide.

"As we are building our network of agents, we are concentrating on finding agents who can help provide start-up, service and after sales. So far, we have signed agreements with

agents in Singapore and Germany, in addition to letters of intent with agents in Spain and Turkey. Norr Systems in Singapore has sold eight MMC BWMS systems to China. Steinback Ingenieurtechnik has sold one system to Lloyd Verft in Bremerhaven," said Gjølseth.

He told *Tanker Operator* that MMC's system is designed to fit all type of vessels, not just OSVs. The main focus is on the range is 100-1,200 cu m per hour. "At this time, we do not have Ex approval," he said.

On 23rd September, another Norwegian concern, **OceanSaver** achieved US Coast Guard (USCG) approval for its Mark II BWTS. The company has also achieved ISO 9001:2008 certification.

The awards built on the system's existing IMO acceptance and DNV type approval,

Based in Drammen, OceanSaver set out to provide efficient and reliable BWTS for medium and large vessels, such as VLCCs, LNGCs and a variety of tankers and bulk carriers, among others.

OceanSaver CEO Houtan Houshang said: "Regulatory compliance is at the top of the business agenda for international shipowners, with good reason.

"It has always been our goal to provide peace of mind in this respect – allowing our customers to focus on their core business, while we focus on delivering effective, affordable and low maintenance BWT technology. The USCG approval is just the latest demonstration of our commitment to that cause," he said.

Houshang added that OceanSaver's modular Mark II system, with its small footprint and easy to maintain system, is equally as attractive for newbuilds as retrofits.

"This allows us to cater for all shipowners that will be required to conform to the Standards for Living Organisms in Ships' Ballast Water Discharged in US Waters, Final Rule," he said "We believe our system is the ultimate solution, offering the ultimate in compliance for the maritime market."

In addition to the recognition from the USCG, OceanSaver has also successfully completed ISO 9001:2008 certification by Lloyd's Register. This standard relates to the efficacy of a company's quality management system and its impact on the firm's ability to meet both customer and statutory and regulatory requirements, alongside enhancing customer satisfaction.

"Minimising risk and adhering to the highest organisational standards is central to successful shipowners," said Houshang. "The ISO 9001:2008 award shows that the same philosophy is at the heart of our business,

Alternate management systems (AMS) accepted by the USCG*

Manufacturer	System name	Acceptance date (2013)
Alfa Laval	PureBallast	15th April
DESMI Ocean Guard	OxyClean	11th Oct
Ecochlor	Ecochlor	15th April
Erma First	Erma First	11th Oct
GEA Westfalia	BallastMaster	11th Nov
Headway Marine Tech	OceanGuard	15th April
Hyde Marine	Guardian	15th April
Hyundai Heavy	HiBallast	24th June
JFE Engineering	Ballast Ace	15th Oct
Jiangsu Nanji	NiBallast	15th Nov
Kururay	Microfade	28th Oct
MMC Green Tech	MMC	29th Aug
NK Co	BlueBallast	15th April
OceanSaver	OceanSaver Mk II	23rd Sept
Optimarin	Optimarin	18th June
Panasia	Glo-En Patrol	29th April
RWO	CleanBallast	15th April
Samkun Century	ARA Plasma	29th Oct
Samsung Heavy	Purimar	4th Oct
Severn Trent De Nora	BalPure	15th April
SunRui Marine	BalClor	1st May
Techcross	Electro-Cleen	4th Oct
Wärtsilä Marine	Aquarius	28th Oct
Wuxi Brightsky	BSKY	4th Oct

*As at 15th November, 2013

Source: USCG

All of the systems listed have been accepted for use in brackish and marine water conditions.

Those accepted for fresh water conditions, include DESMI, Jiangsu Nanji and Wärtsilä, the USCG said.

leading to products and services that meet requirements and surpass expectations, time and time again."

On 28th October, **Wärtsilä** was granted AMS acceptance for its AQUARIUS BWMS.

AMS acceptance is the first stage towards obtaining full USCG type approval and Wärtsilä said that it anticipated having all activities necessary to gain full US type approval completed within the five year interim period.

Based on an evaluation of the BWMS test data by the USCG, AMS acceptance was granted for use over the full range of water salinities, ie fresh, brackish and seawater.

As one of only two AMS accepted systems without salinity restrictions thus far, the Wärtsilä solution allows vessels fitted with the system to operate in the Great Lakes region, which is important for operators in this challenging environment.

"AMS acceptance is an important milestone in providing shipowners with a BWMS that enables true global operations and is a key part of the Wärtsilä BWMS partnership programme, which aims to support our customers in meeting their environmental compliance objectives," said Joe Thomas, director, Wärtsilä Ballast Water Management Systems.

As well as supplying the system to newbuilding OSVs, Wärtsilä has retrofitted a system on board two LPG carriers for Chemgas and is also being installed on an LPG carrier owned by Carbofin, which is currently trading in US waters.

As part of the Wärtsilä partnership programme, a shipowner has the choice of filtration with either ultra-violet (UV), or electro-chlorination (EC) ballast water treatment.

Wärtsilä is also preparing an AMS application for its AQUARIUS EC BWMS so as to provide customers with fully approved technology options upon completion of the approval process.

Elsewhere, **BIO-UV** has said that it was expecting to receive the USCG acceptance of its BIO-SEA BWTS as an AMS by the end of this year.

The systems' capacities range from 100-1,000 cu m per hour. They use filtration with UV water treatment.

The company said that the choice between different sizes and designs of filter facilitates retrofits, as well as newbuilding installations.

BIO-UV operates from new premises located in Lunel, South of France and has partners in Singapore, Netherlands, China, Germany and Greece.

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The strengthening wind of change on fuel quality

Decades of technological advances now mean that vessels are propelled around the globe at a much greater rate, carrying a massive range of cargos.

Most owners and operators will be more than happy to tell you that any vessel is only effective if it is on the move and the driving force behind any ship is its engine and the fuel that propels it. In the current economic climate, it is vital that vessels continue to ply their trade and, as such, when problems arise, it is often the fuel used on board which falls under scrutiny.

The years 2015 and 2020 (or 2025) will have a massive impact on the shipping industry and will go a long way to determining exactly which fuels are to be used on board. At the moment it is extremely difficult to be

Any industry needs to adapt if it is to survive and the shipping industry is no exception.*

sure just how the industry will move forward as far as fuel is concerned.

Speculation relating to the use of alternative fuels and abatement technologies can be seen on a daily basis and, although developments in both areas continue, it is highly unlikely that either will become the universal solution for owners and operators.

Distillate availability

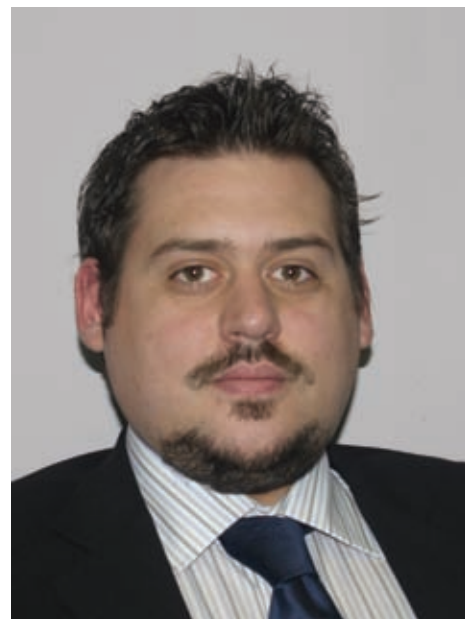
The 2015 change for Emission Control Areas has, so far, prompted suggestions that distillate product will be used by vessels to comply with regulatory requirements, but questions still remain as far as availability and quality are concerned. However, although the first of the expected changes is only just over a year away, more immediate concerns loom large.

As a testing agency, Intertek Lintec ShipCare Services examines thousands of fuel samples every month from all parts of the world, to establish exactly what owners and operators are receiving and using on board their vessels. The monitoring of quality trends plays a key role in the services offered by the ShipCare initiative and, as such, it is our responsibility to advise when something unusual occurs.

In looking at historical quality data, two important facts stand out:

- 1) Although fuel may be deemed to be out of spec, it does not mean it is unsuitable for use.
- 2) One sample of fuel in every five submitted will not meet the requirements for the grade against which it is sold.

At the moment, one of these facts still holds true, the other does not. Test data obtained since the implementation of the Marpol requirements confirms that the quality of fuels supplied does fluctuate, but in general the



Intertek Lintec ShipCare Services' Michael Green.

number tends to be around one in five as previously suggested. Data from the first quarter of 2013 goes some way to proving this assertion, in that 19.9% of all tested samples showed one or more parameters to be outside the limits for that particular grade of fuel based on ISO 8217.

Requirement failures

Moving into the second quarter of this year, this trend was expected to continue but when the test data was examined it was proven not to be the case. Quality data from 2Q13 showed that 25.3% of all submitted samples failed to meet the requirements for the grade of fuel which had been purchased. Based on these figures, one fuel in every four is now deemed off spec.

To say this sort of spike is completely unheard of would be untrue. Quality trends in the past have shown fluctuations of up to 3%, but over a much longer time-frame, or at a time of significant legislative change. One prime example of this was the increase in off-specs witnessed during 2Q12. Between 1Q



One fuel out of four is deemed to be off spec.

and 2Q of last year, an increase of around 2.5% was noted in the number of recorded off-specs. The actual test figures showed 23% of all submitted samples in 2Q12 to be off spec, compared to 20.5% per cent in 1Q12.

If we think of this figure in relation to developments within the industry at the time, it becomes apparent that this fall in quality coincided with the forthcoming implementation of the US ECA. However, as the changes witnessed in 2Q13 did not coincide with any legislative development, it brings the issue more sharply into focus. This being case, and in light of the circumstances, a jump of around 5% during a three-month period is not something that can be easily overlooked.

When examining individual parameters, no immediate concerns are raised with regard to any one particular test. On the contrary, it would appear that all the usual issues are seen, but at an increased level. Density, viscosity and sulphur all contribute to the bulk of the issues noted, with other more critical parameters being seen at much lower levels.

Further study of the data for the remainder of 2013 will confirm whether this shift in quality can be looked at as a blip. However, were these figures to be maintained in 3Q and 4Q of this year, it would indeed suggest that the wind of change has strengthened and that concerns in relation to quality, based on significant legislative changes, are well- founded.

TO

**This article was written by Michael Green of Intertek Lintec ShipCare Services.*



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Lack of knowledge leading to increased cat fines' claims

With individual claims arising from excessive main engine wear caused by cat fines in the fuel oil likely to exceed \$1 mill and no sign of the problem being remedied at source, operators will have to take on the responsibility for reducing these claims.

Braemar SA's chief surveyor for Western Europe, Paul Hill, gave this warning in a presentation given at the recent International Union of Marine Insurance (IUMI) London Conference.

Catalytic fines are microscopic particulates that remain in marine fuel oil as a result of the crude oil refining process, which can become embedded into engine components and cause abrasive wear, leading to significant insurance claims.

Hill explored the discrepancy that exists between ISO standards for cat fine content and the recommended content by engine manufacturers.

Explaining that this placed the onus on effective filtration, purification and fuel management on board the vessel, he expressed

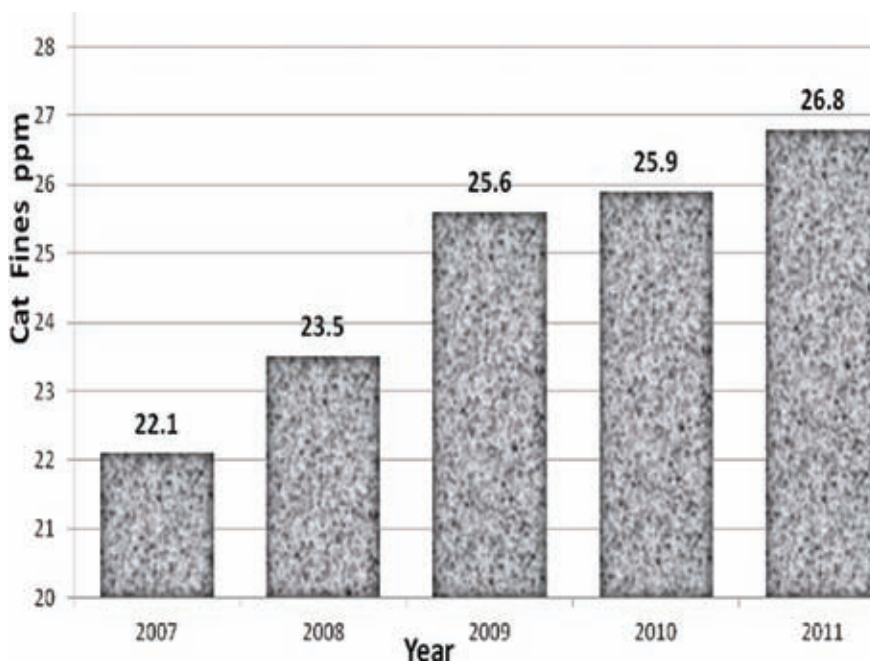
the concern that on board purifiers often have insufficient capacity and poor efficiency for the task. In addition, operators did not know in advance the quality of fuel being brought on board.

He also examined the difficulties faced by the insurance industry, as demand for low sulphur fuel, which can contain higher levels of cat fines, continues to increase, and outlined some of the preventative action that could be taken.

"The leading main engine makers MAN B&W and Wärtsilä specify fuel with a maximum of 15 ppm cat fines to be used in their engines, yet the ISO Limit remains higher, with refiners reluctant to pass on – or absorb – the additional costs involved in supplying fuel at the recommended level," he said. "They take the view that as all ships are



Braemar SA's Paul Hill.



Marine engine damage due to catalytic fines. Source: Braemar SA.

built with a fuel treatment system that is capable of removing the cat fines to a level below the 15 ppm stated by engine makers, the onus is on the vessel operator to treat the fuel system.

"Yet ships' engineers are operating with one hand tied behind their back, as they often do not know and cannot predict the quality of the bunker fuel being brought on board. In addition, the industry has seen a fall-off in good maintenance practices, such as regular cleaning of fuel oil settling and service tanks.

"There are also industry wide concerns that there is a tendency for shipyards to fit purifiers of the bare minimum capacity in order to save them money but invariably at a detriment to the shipowner," he said.

In conclusion, he recommended that all fuel received on board should be treated as if it contains cat fines and the fitting of cat fine analysis equipment should be considered.

TO

Consider seawater propeller shaft lubrication

Seawater is a free environmentally acceptable lubricant (EAL) under the forthcoming US Environment Protection Agency Vessel General Permit (VGP).*

If a vessel is trading in US waters, the owner/operator need to be aware of the new oil to sea interface law that comes into effect on 19th December, 2013.

According to the new VGP, all vessels built on or after this date, must use an EAL in all oil to sea interfaces.

For all vessels built before this date, unless technically not feasible, shipowners must use an EAL in all oil to sea interfaces.

Most vessels use mineral oil to lubricate the propeller shaft and the oil is contained in the stern tube by the aft seal – which is the oil to sea interface. In most cases, you cannot just replace the mineral oil with seawater, or other oil-based EALs.

Oil-based EALs need to be compatible with the sealing materials to ensure leakage is controlled – shipowners will need to check with their seal supplier. It may be necessary to upgrade the sealing rings, or upgrade to a new seal. Oil-based EALs may impact on the seal wear life meaning increased maintenance costs.

Typically, costs of oil-based EALs are three to five times more expensive than mineral oils. If using a sophisticated air seal, commonly promoted as a non-polluting aft seal, you are still required to use an oil-based EAL, as it is not possible to guarantee that oil leakage will never occur. Fishing nets and ropes can still

damage the seals allowing leakage to occur.

A concern for shipowners is that oil-based EALs are still considered a pollutant under the Oil Pollution Act of 1990 (OPA '90) and US Clean Water Act (if there is a sheen). Any discharges of oil-based EALs still require reporting of the discharge to the US Coast Guard, as well as having clean-up and remediation costs.

Even though biodegradable lubricants may be deemed non-toxic by OECD testing, their presence on the water surface is a threat to seabirds – the hydrophobic nature of oil causes bird plumage to absorb the oil readily, thereby decreasing a bird's insulation, waterproofing and buoyancy leading to death from hypothermia and starvation.

According to Canada's Migratory Birds Convention Act 'No person, or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters, or an area frequented by migratory birds, or in a place from which the substance may enter such waters, or such an area.'

Seawater is free

For newbuildings, many shipowners are now specifying seawater lubricated propeller shaft bearing systems, illustrated by over 600 commercial ships using a seawater-lubricated

system that uses no oil – meaning full compliance with the VGP.

Currently, the EPA recommends that all newbuilding vessel operators endeavour to use seawater-based systems for their stern tube lubrication to eliminate the discharge of oil from these interfaces to the aquatic environment.

Existing ships can be converted to seawater-lubricated propeller shaft systems, as these systems typically fit in the same space as an oil lubricated system. Several companies have converted their existing ships from oil lubricated systems to seawater lubricated shafts saving hundreds of thousands of dollars per year on stern tube lubricants and aft seal maintenance costs.

The oil-to-seawater conversion can be accomplished during a planned drydocking where corrosion resistant shaft liners and a water lubricated forward seal are pre-ordered and the shaft and non-metallic bearings are ready for install when the ship arrives at the shipyard.

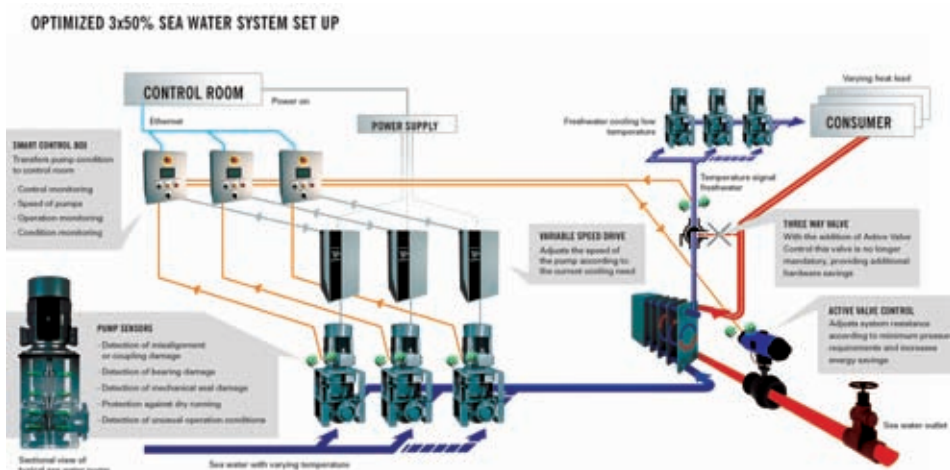
Two choices

So when it comes to discharges from a ship's propeller shaft system, the shipowner that trades in US waters has two choices for their existing ships and ships they plan to build:

- 1) Replace mineral oil with an oil-based EAL to lubricate the metal bearings and ensure the seal is compatible with the EAL
- 2) Convert, or build a ship with a seawater-based system using non-metallic prop shaft bearings.

Some shipowners, such as CSL, Algoma, ConocoPhillips and others are already compliant with the VGP, as they have chosen to use seawater as the propeller shaft lubricant thus have reduced operating costs with no oil pollution worries.

TO



**This article was taken from a presentation by Craig Carter, director of marketing and customer service, Thordon Bearings.*

Business opportunities in FPSOs

A Tanker Operator report by Ian Cochran

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Untangling the FPSO sector

The FPSO industry is in a major growth phase, with orders for between 90 and 240 new FPSOs expected to be placed in the next 5 years, at a cost of between \$200m and \$2bn each. Two thirds of these are expected to be tanker conversions and one third from new build. There are currently around 200 FPSOs in service.

This creates many business opportunities for tanker operators and companies with tanker skills and expertise - providing vessels to offload the FPSOs, and helping build and operate FPSOs - including naval architecture, shipyard supervision, surveying, inspection, maintenance and integrity management, procurement and providing crew.

Ian Cochran, editor of Tanker Operator magazine and a specialist on FPSOs, has written a 23,000 word report to help you find your way through the FPSO industry and work out where opportunities might lie for your company.

The FPSO industry can look like spaghetti, just like the pipeline infrastructure on the topsides (by the way, FPSO topside infrastructure has grown in weight from around 1,000 tons in 1981 to 23,000 tonnes on soon to be delivered vessels going to Brazil).

Contents

The report begins with an overview of the current FPSO market, supply and demand, and analysis of emerging design criteria and classification society requirements.

This is followed by a review of emerging FPSO requirements in regions of the world (Asia Pacific, Australasia, East Africa, West Africa, North Sea, South America, Gulf of Mexico, Mediterranean, Canada);

A review of large FPSO owners (Petrobras, SBM, BW Offshore, CNOOC, Teekay and Modec); FPSO shipyards (Brasa, PAENAL, Cosco, DAEWOO, Hyundai and Keppel Offshore),

A review of emerging technical factors to be aware of (LNGFPSOs, FPSO propulsion / power, tanker operations, movements and asset monitoring).

The appendix has a list of all known FPSOs in operation and under construction.

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Am I Cured? (part 2)

This article is another in the series examining the issues surrounding the ‘post curing’ of organic cargo tank coatings. It explores and contrasts the efficacy of different recommended post curing methods.*

The issue of post curing of cargo tank coatings as previously reported in this publication (Am I Cured- Nov/Dec, 2011) is still very much a taxing issue for many owners/operators for reasons explained in that article.

This article reports on a further project carried out by Marinspec Associates (MAL), focusing in more detail on the different results, which may occur depending on the recommended post curing process adopted following application of the cargo tank coating system.

MAL, in collaboration and assistance with a major shipowner/operator and two major coating manufacturers, conceived the project, which was designed to compare the effectiveness (efficacy) of a number of cargo tank coatings in various recommended post curing regimes.

From the published technical data, MAL identified the recommended post curing options for each coating, including their type, duration and temperature. In total 35 post curing regimes were identified, 23 of which were recommended by the coating manufacturers and a further 12 included by MAL as standard references. Five post curing media were assessed, at temperatures ranging from 50 deg C to 80 deg C and durations from a few hours up to 10 days.

Mild steel test panels, each coated with the respective tank coatings, were supplied by the coating manufacturers. The panels were coated in accordance with the manufacturer’s standard published specifications, and allowed to air dry only – no post curing was carried

Table 1: Data for all post curing regimes for CTC 1			
Regime number & Coating number	Regime detail	Mid-point Tg (°C)	Final cure exotherm normalised (J/g)
Regime 13 Coating 1*	Veg Oil 50°C for 10 days	81.06	4.42
Regime 14 Coating 1*	Veg Oil 60°C for 5 days	78.11	4.37
Regime 1 Coating 1*	Fresh water 60°C for 16 hours	93.18	1.48
Regime 7 Coating 1*	Salt water 60°C for 16 hours	96.44	1.33
Regime 24 Coating 1	Dry Air 60°C for 16 hours	79.18	2.36
Regime 5 Coating 1*	Fresh water 80°C for 3 hours	97.77	0.23
Regime 11 Coating 1*	Salt water 80°C for 3 hours	96.48	0.20
Regime 28 Coating 1	Dry Air 80°C for 3 hours	87.02	1.0

* Recommended post curing regime.

out by the coating manufacturers. Samples of the liquid paint applied to the panels were also supplied to MAL as reference standards.

Post curing of all the panels was carried out by MAL and after the task’s completion, samples of the different coatings were removed from the steel panels, accurately weighed and then subjected to differential scanning calorimetry (DSC) analysis, for identification of glass transition point (Tg) and final cure exotherm (FCE), which is typically a measure of unreacted material and therefore a good indicator of complete (or incomplete) post curing.

RESULTS:

Details of the results are seen in Tables 1, 2 and 3.

Consider the results in Table 1 for Cargo

Tank Coating (CTC) 1, above.

All the regimes marked with an asterisk are the post curing regimes recommended by the paint manufacturers, which means that all cargo tank coatings exposed to these conditions should theoretically achieve the same state of cure, or at least have attained sufficient cure to provide the same chemical resistance. However, as can be seen this is not actually the case.

Looking at the results from the test panels post cured in hot vegetable oil, it can be seen that both regimes achieved a Tg of approximately 80 deg C and an FCE of about 4 J/g, indicating there was still some unreacted material even on completion of post curing. The results are actually quite consistent with each other, which one would expect.

Compare these results to the test panels cured in fresh water and salt water at 60 deg C and it is noted that the Tg increases to around 94.5 deg C, and the FCE is reduced to approximately 1.4 J/g. These latter results indicate a higher state of cure, compared to the test panels that were post cured in vegetable oil, which should reflect in better chemical resistance.

If we then consider the results from the test panels post cured in fresh water and salt water at 80 deg C, it is noted that there is a further increase in Tg and decrease in the FCE. This again indicates an even higher state of cure, which should reflect in further improved chemical resistance.

In conclusion, it seems unlikely that these coatings would all display similar chemical

Table 2: Data for all post curing regimes for CTC 2

Regime number & Coating number	Regime detail	Mid-point Tg (°C)	Final cure exotherm normalised (J/g)
Regime 2 Coating 2*	Fresh water 60°C for 16 hours	87.23	0.72
Regime 8 Coating 2*	Salt water 60°C for 16 hours	88.78	1.62
Regime 25 Coating 2	Dry Air 60°C for 16 hours	84.15	3.21
Regime 4 Coating 2*	Fresh water 70°C for 8 hours	86.50	0.95
Regime 10 Coating 2*	Salt water 70°C for 8 hours	85.10	0.57
Regime 27 Coating 2	Dry Air 70°C for 8 hours	86.00	10.91
Regime 6 Coating 2*	Fresh water 80°C for 3 hours	94.22	1.02
Regime 12 Coating 2*	Salt water 80°C for 3 hours	94.22	1.18
Regime 29 Coating 2	Dry Air 80°C for 3 hours	93.37	5.04

* Recommended post curing regime.

resistance even though they have all been post cured in direct accordance with the manufacturers' published recommended guidelines.

It is also perhaps interesting to note that the test panels post cured in dry air at 60 deg C and 80 deg C show lower Tg and higher FCE readings compared to the test panels post cured in fresh water and salt water.

Consider now the results in Table 2 for Coating 2 in the previous page:

Looking overall at the post curing in fresh water and sea water from 60 deg C to 80 deg C, it is interesting to see that at 60 deg C and 70 deg C there appears to be little effect on the Tg result, but the FCE is noticeably reduced in the test panels post cured at 70 deg C compared to the post curing at 60 deg C. When the post curing temperature is raised to 80 deg C, it is perhaps not surprising to see an increase in Tg, but curiously, the FCE result is slightly higher compared to the test panels post cured at 70 deg C, indicating that the relationship between Tg and FCE is not absolute.

Comparing the wet post curing in both salt and fresh water to the dry post curing at the same temperatures in dry air, we see a clear trend; namely a similar Tg is achieved, but at all temperatures the FCE result is noticeable higher in the test panels post cured in dry air. This observation is most pronounced for the test panels post cured at 70 deg C, where the FCE for the wet post cured samples is 10 times less than the FCE for the dry post cured samples. There are two logical explanations for these observations:

- 1) Post curing in dry air does not extract any curing agent and therefore all curing agent is available for reaction with the resins.
- 2) Not all of the reactive material was available 'to react' during the wet cure process. This may be a result of extraction of some part of the curing agent during the wet cure process. (See later discussion)

Generally, the results from post curing with hot air alone produce inconsistent results that may be explained by the above or alternatively, perhaps reflecting the poor energy transmission properties of dry air.

Consider now the results in Table 3, on the next page, for Coating 3:

It was noted that CTC 3 generally produced a more consistent degree of cure following post curing in accordance with the manufacturers published guidelines, compared to the other two coatings assessed. This statement is made in view of the far more consistent Tg readings and lower/more stable FCE readings, indicating that the post curing process has apparently been more thoroughly completed.

In two cases where the test panels were post cured at 80 deg C in salt water and fresh water no FCE could be detected, indicating that perhaps the coatings were fully cured? However, in both of these instances it was noted that the Tg was not as high as it was following some of the other post curing regimes, which may actually contradict the statement that the coatings were fully cured.

One explanation for this is considered in the following discussion paragraph.

Discussion

1) In an ideal thermosetting system the balance between glass transition temperature and final cure exotherm would always be maintained; as the Tg increases, so the FCE decreases. However, cargo tank coatings are not ideal systems. They are composite systems, containing a number of different components in the dry film such as resins, pigments, extenders and additives and as a consequence, they are also semi-permeable membranes, meaning they can absorb materials they come into contact with.

2) Examination of the material safety data for the tested paint systems revealed they are classified chemically as epoxy phenolics that are cured with a combination of complex amines some of which are water miscible, water soluble and/or water sensitive. The possibility

closed gauging



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Table 3: Data for all post curing regimes for CTC 3

Regime number & Coating number	Regime detail	Mid-point Tg (°C)	Final cure exotherm normalised (J/g)
Regime 15 Coating 3*	Veg Oil 60°C for 3 days	93.37	0.37
Regime 18 Coating 3	Fresh water 60°C for 3 days	99.33	0.43
Regime 21 Coating 3*	Caustic 50% 60°C for 3 days	91.37	0.64
Regime 30 Coating 3	Dry Air 60°C for 3 days	88.46	0.22
Regime 33 Coating 3*	Salt water 60°C for 3 days	85.36	0.51
Regime 16 Coating 3 *	Veg Oil 70°C for 2 days	89.43	0.42
Regime 19 Coating 3	Fresh water 70°C for 2 days	95.13	0.22
Regime 22 Coating 3*	Caustic 50% 70°C for 2 days	91.08	0.50
Regime 31 Coating 3	Dry Air 70°C for 2 days	87.99	0.25
Regime 34 Coating 3*	Salt water 70°C for 2 days	86.62	0.17
Regime 17 Coating 3*	Veg Oil 80°C for 1 day	95.70	0.20
Regime 20 Coating 3	Fresh water 80°C for 1 day	90.04	None detectable
Regime 23 Coating 3*	Caustic 50% 80°C for 1 day	91.71	0.18
Regime 32 Coating 3	Dry Air 80°C for 1 day	91.91	0.36
Regime 35 Coating 3 *	Salt water 80°C for 1 day	92.48	None detectable

* Recommended post curing regime.

therefore exists that some of these amine curing agents might be extracted when the coatings are post cured by water, or aqueous solutions. It should be considered that the extraction of these amines may occur before they can be used in the curing of the epoxy resins, thus rendering the systems incompletely cured. The speed and extent to which this extraction occurs being dependent on the nature of the amine, its solubility in water, the temperature of the post curing process, the nature of the post curing medium and the permeability of the coating to water and/or aqueous solutions.

The graph below illustrates the variation in state of cure, when coatings are post cured at

the same temperature, but in different post cure media.

The Tg is clearly similar for each post cure media, but the final cure exotherm (denoted by the shaded area at the end of each trace) is much smaller for those samples post cured in fresh water and salt water compared to the sample post cured in dry air.

3) According to the manufacturers published post curing guidelines, two of the cargo tank coatings under assessment allow the use of fresh water, or salt water for post curing, as well as suitable heated cargoes. The third coating may be post cured with suitable heated cargoes, salt water, or a solution of caustic soda in water. The use of fresh water for post

curing the third coating is not addressed in the manufacturers published data.

Conclusions

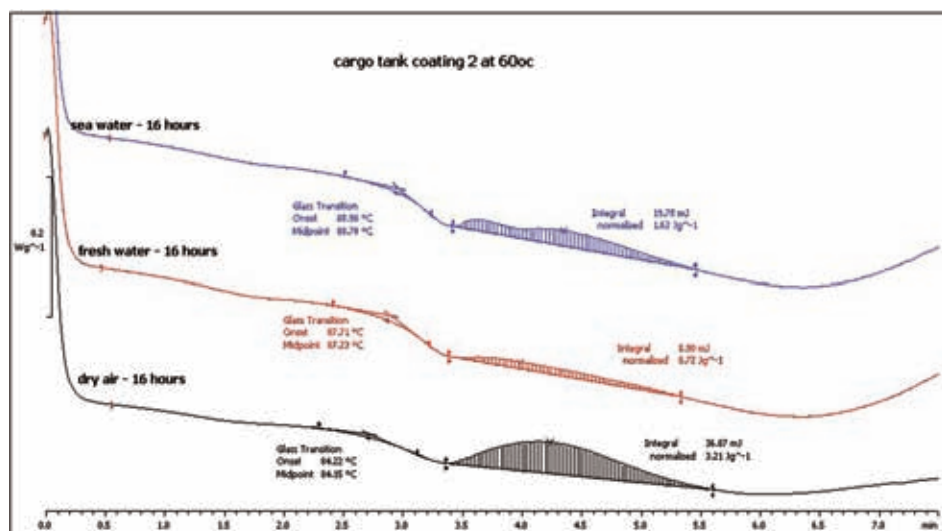
A) It is clear that all of the recommended post curing regimes do not result in the same state of cure for each of the coatings evaluated in this investigation. It may be that the cargo tank coating manufacturers need to advise what the minimum state of cure should be, in order to achieve the design chemical resistance for the coating. Better advice would also seem to be needed on the methods of post curing required to achieve that state, and how it should be measured in practice.

B) It is also clear from the results that water based curing media are much more efficient at transmitting heat to the coatings and therefore offer the best means of post curing. However, there is some evidence to suggest that fresh water in particular, may extract some part of the curing agents from the coatings during the post curing process, which may have a significant and potentially detrimental effect on the final chemical resistance of the post cured coating.

C) With this in mind it is very apparent that further investigation is required in order to establish that the post cured cargo tank coating, really is post cured to the level that is required to provide the necessary level of chemical resistance to allow the vessels to trade in the chemical market. Typically the following areas should be most thoroughly explored because they have the most immediate impact on the earning capabilities of the vessels:

- Identification of the safest, most effective post curing media.
- Investigation into the degree of extraction of the amine based curing agents into the post curing media and how this impacts on the final state of cure and chemical resistance of the applied coating.

TO



Variation in state of cure. Source: MAL.

Acknowledgement

*This article was produced by Bill Woods and Guy Johnson of Marinspec Associates. Both wish to express their gratitude to a major shipowner/operator, along with the manufacturers of the cargo tank coatings for their participation and support in this project. Any person, or company seeking further advice, or guidance, on the issue of post curing and its measurement, should make contact with Marinspec Associates - mail@marinspec.co.uk

New cleaning product series introduced

Marine Care, based at Maassluis, outside Rotterdam, has introduced a series of on board cleaning products under the banner of GreenCare.

The GreenCare range replaces traditional solvent, acid and hydroxide based cleaners for complete maintenance and cleaning on board vessels.

The range includes

GreenCare ACF for engine room air coolers, filters and machinery parts, this is a powerful cleaning and maintenance product to remove/dissolve carbonised, lubricant and mineral oils.

GreenCare Blow Out for use in sewage and piping systems. It is claimed to be an excellent line cleaner and descaler, which breaks down calcium, lime, scale, uric stone and other deposits.

GreenCare Descaling Liquid for use in boilers, condensers, evaporators, heat exchangers, cooling and pipe systems. This is a very efficient, non acid, descaling liquid for dissolving calcium, lime, scale and other deposits.

GreenCare Omni for use anywhere on board, this unique multi-purpose cleaning agent combines and replaces the full power of acid, solvent and caustic based cleaners in one formula.

GreenCare Rust Remover for use on deck, in tanks, or in the engine room. This is a strong cleaner used to remove rust and rust stains from any metal and non-metal surface

“The GreenCare range... the first of its kind based on revolutionary technology...is safe on skin, safe on equipment and safe to store and yet very effective.”

the same way as any conventional phosphoric acid based cleaner.

GreenCare Synergy for use in tanks, engine rooms, bilges, decks, in the accommodation, or anywhere else on board. It is described as a very powerful unique degreaser, replacing both solvent and caustic based cleaners.

Marine Care Singapore-based Kunal Chadha told *Tanker Operator* that a couple of products have been specifically formulated for tank cleaning on board tankers.

He explained that in the industry today, most chemicals are made of acids, solvents and hydroxides. In general, acids, solvents and hydroxides carry various risks. Minimal exposure to human skin and the environment is recommended with these products.

However, not so with the GreenCare range,

as it is the first of its kind based on revolutionary technology, he claimed. He said that GreenCare is safe on skin, safe on equipment and safe to store and yet very effective.

These products are used in a similar fashion to the ones being replaced. “In general, it’s quite simple to use and all products carry data sheets on specific usage. Other than that we have a technical team ex Rotterdam, who can provide advice via phone, or email and can also visit the ship if needed,” Chadha explained.

The chemicals are manufactured in Holland and distributed worldwide to other stock holding centres and are currently available in Rotterdam, Hamburg, Busan, Singapore, Dubai, Houston, Shanghai, Bergen and Miami.

TO

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PSM introduces replacement mechanical float level switches

PSM Instrumentation's range of mechanical marine float level switches are among the most widely used, level products in marine tank level measurement and pump control, the company claimed.

Its KD series also now includes replacement solutions for Mobrey products that fail in service, providing a practical alternative when original products may be difficult to obtain, due to obsolescence, or cost issues.

PSM has sold its hazardous use approved and marine certificated KD series of mechanical float level switches to newbuilding and repair yards worldwide.

Mechanical float level switches, which can be horizontally or vertically mounted, provide high-level, or low-level detection of liquids in all types of vessels and often form an important control, or safety function.

Typical fluids measured include fuel oil, lubricants, sea water and bilge waste. These fluids provide a challenge because of the compatibility issue with the with float switch construction materials used, such as metals, plastics and rubbers. There may also be a flammable gas, or liquid present near the installation requiring a device certified as safe for use in hazardous areas.

With limited space on board a vessel, meaning the installation is not always easily accessible for routine testing or maintenance, any switches installed must be capable of operating for many years without fault. Consequently, the demands placed on these products are onerous and only those designed and constructed specifically for marine use will prove to be reliable and safe over the long term.

With a rugged construction suitable for extreme marine environments, PSM's KD series of switches are capable of meeting all these demands and, in addition, are approved and certificated for marine applications by many of the leading type approval organisations, as well as hazardous area installation according to the ATEX EExd approval, the company said.

PSM also said that older technologies for level measurement, such as bubbler systems, are increasingly proving unreliable and costly in time and money to maintain.

The company claimed that its tank gauging instruments and systems have been designed and constructed to meet all tank gauging requirements and are the ideal replacement for obsolete technologies.

From a single switch to complete systems, PSM's type approved and quality certified range of transmitters, gauges and switches are compatible with fuel oil, lubricants, hydraulic fluid and bilge, or ballast water.

For example, PSM said that it had drawn on 30 years' of global marine application experience, to develop the ict 1000, a smart dual mode Modbus and analogue liquid level transmitter that offers the highest possible standards in terms of performance, versatility, functionality and reliability.

The transmitter's advanced capacitive measurement cell is manufactured in robust and durable ceramic, and the design of the sensor means the diaphragm is fully supported and protected against overload and shock pressure conditions.

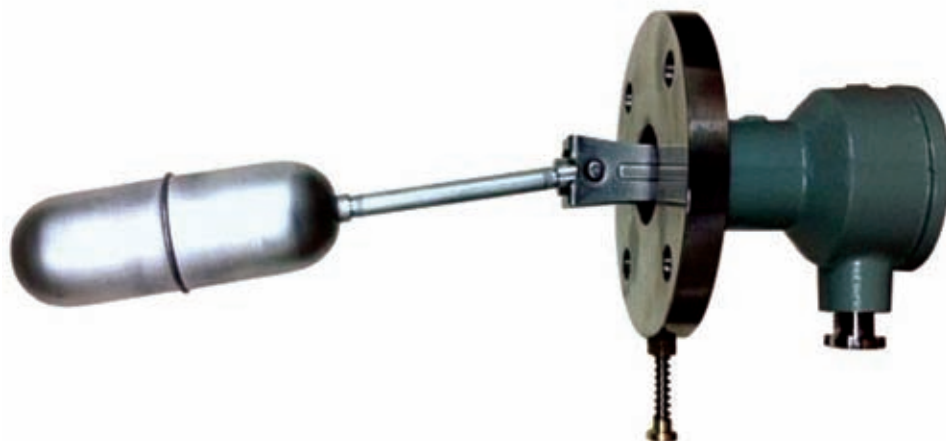
Manufactured from 316 stainless steel and employing an engineered Kalrez seal assembly to provide a fully submersible (IP68)

construction, the ict 1000 is capable of withstanding the toughest operating conditions for many years, PSM claimed.

Advanced features are not confined to mechanical design. The ict 1000 has a powerful on-board micro-controller to precisely monitor the pressure related output of the capacitive cell. Ambient temperature is also monitored to provide a fully compensated measurement output.

The transmitter is certified according to ATEX regulations for installation in a hazardous area and approved by many major classification societies as suitable for use in marine applications.

TO



The mechanical float level switch series can be mounted either vertically, or horizontally.

Chemical tank cleaning animated video launched

Indian-based training video supplier KARCO has released Chemical Tanker Cleaning – A Simple Understanding, Vol 1 & 2.

Based on practical approach to this perceived complex operation on board chemical tankers, this video of 35 minutes (Vol 1 & 2) covers the key elements, which lead to an effective and economical tank cleaning, the company explained.

The salient points of this video are:

Vol 1- Understanding the Tank Cleaning principals (20 mins)

- Developed purely from operational point of view using the 3D animation platform.
- Personal, safety & pollution issues beyond the scope of this video.
- Endeavours to decipher the perceived complex procedures of cleaning a chemical tanker.
- Approaches the cleaning procedure based on the physical and chemical (product) characteristics of cargoes rather than a commercial 'from-to' suggestion.
- Uses an imaginary 3D animated character

to visualise the effect of tank cleaning inside a tank being cleaned for easy understanding.

- Comprehend the importance of key elements of pressure, temperature of water for cleaning.
- Understand the bearing of tank coatings on cleaning of cargo tanks along with their resistance to chemicals.
- Evaluate the different ways of carrying out chemical wash of the tanks.
- Pay attention to the information to be extracted from guides & publications.
- Understand the different tank cleaning machines used for cleaning and their comparative advantages.
- Walk through with a detailed procedure of prewash (steam, water, chemical), main wash, chemical wash, freshwater rinsing, steaming & drying.
- Respect the effect of surrounding environment on tank cleaning operations.
- Be guided by a tank cleaning checklist developed keeping above factors in mind.
- A brief text description of couple of

commonly executed tank cleaning operations.

Vol 2 –Tank Inspection and Wall Wash Tests (15 mins)

- Understand the terms – 'Water White or Visual' standard & 'Wall Wash or High Purity' standard being explained visually.
- Understand what constitutes a standard wall wash test kit.
- Respect the need of diligent personal operational precautions for taking wall wash samples.
- Visually comprehend the correct procedure of taking wall wash samples inside the cargo tanks.
- Clearly view the four basic and most relevant wall wash tests of wall wash standard being conducted viz-
 - ◆ Colour
 - ◆ Hydrocarbon test
 - ◆ Chloride test
 - ◆ Permanganate time test (PTT)
- Understand some basic additional tests, such as acid colour etc, described briefly.

TO

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Major conference marks end to Helios project

Helios was a co-operation research project within the EU's 7th Framework Programme for Research and Technical Development/Transportation with MAN Diesel & Turbo acting as co-ordinating partner.

The general objective of the project was to develop a research platform for an electronically controlled, 2-stroke, low-speed, marine diesel engine that operates on the principle of the direct injection of HP Compressed natural gas (CNG) to meet the needs of the emerging LNG market.

Around 100 experts from around the world attended the conference to hear presentations on the gas-engine technologies garnered from Helios, as well as on other factors influencing the development of gas-fuelled ships engines.

Activities and results

A broad range of activities were started over the past three years under the Helios framework.

One concrete result was the development of the new, gas-fuelled ME-GI engine, a dual-fuel unit that MAN Diesel & Turbo has since successfully released into the market.

An international conference on 27th November in Copenhagen marked the final phase of the EU-funded Helios project.

MAN said that generally speaking, Helios has generated many positive results and increased the knowledge base in several technical fields, including the development of:

- Gas-engine components.
- New gas injection valve and other main components.
- Gas-control block.
- New gas-composition sensor.
- New handheld calibration device.
- Dedicated control and safety system.
- Laser-optical, temperature-measurement technology.
- New high-temperature materials.
- Analysis of potential tribology and corrosion problems.

As already mentioned, Helios' most significant result was the development of the ME-GI engine, utilising the direct-injection principle, a concept the market

Environmental benefits

NOx	24% reduction
CO₂	23% reduction
Methane 'slip'	0.2-0.3 g/kWh
PM	85% reduction
CO	Very low
SO₂	Very low
Smoke	Almost eliminated
Thermal efficiency	Very high

has embraced resulting in several shipowners placing orders.

For example, recently, US-based container and ro-ro vessel operator Matson ordered two high powered ME-GI gas engines – the biggest dual-fuel engines ever ordered in terms of power output – for two new container vessels, while another US owner TOTE and leading tanker/gas carrier owner/operator Teekay also placed ME-GI orders at the end of last year. The first engine is scheduled for completion in 2014.

MAN said that the potential for more orders in this new, emerging market segment, was "great".

The Helios results were assimilated through collaboration with several different universities and companies. A research platform was constructed at MAN Diesel & Turbo's facilities in Copenhagen, where various ideas were tested and components subsequently developed.

The ME-GI engine complies with the IMO's Tier II requirements and, in combination with exhaust gas recirculation (EGR), its emissions are below Tier III limits. A particularly significant, environmental benefit is the ME-GI's very low methane slip.

The major benefits stemming from the Helios project are summed up in the table above.

Participating partners

Name	Type	Country
MAN Diesel & Turbo (Coordinator)	Large company	Denmark
University of Erlangen	University	Germany
Germanischer Lloyd	Large company	Germany
Jönköping University	University	Sweden
Kistler Instrumente Wintherthur AG	Large company	Switzerland
Lund University	University	Sweden
Sandvik Powdermet	Large company	Sweden
TGE Marine Gas Engineering	Large company	Germany
Uppsala University	University	Sweden



Another in the series of *Tanker Operator's* successful 'Making money in a tough market' conferences was held in Singapore on 11th October.

This half day event entitled 'Improving economic performance – what works and what doesn't?' was kicked off by **Arvind Sharma**, Bernhard Schulte Ship Management's director of loss prevention and HR (Marine) who addressed the question of costs and how to reduce them.

He said that the major challenge today for a vessel operator was to find a way of cutting costs effectively.

To illustrate what was involved, he gave a breakdown of the three major cost components to running a vessel. These were –

A) Crew Costs

Pre-joining costs, wages, allowances, benefits, victualing, travel, training, crew P&I insurance.

B) Technical Costs

Shipmanagers fees, stores, spares, repairs & maintenance, lubricating oils, drydock, insurance, communication, classification, vetting inspections.

C) Mortgage/Finance Costs

Starting with the highest cost – crewing - the main expenses consist of manning agency costs, seafarers' wages, travel, training and crew P&I claims.

Breaking these items down Sharma explained that manning agencies usually charge market level manning fees per month.

In case of large operating/managing companies, they may have their own manning office in the crews country.

In both cases, costs savings are possible and BSM has tightened up on the costs of the manning offices in 14 countries by removing duplicate work and reducing numbers where possible. "Similarly, we have reduced costs of supplying overalls, shoes and uniforms by hard negotiation," he said.

The highest component in crew costs is wages. Ratings wages are dictated by various unions and there is limited potential to save money here.

In contrast, officer wages are dictated by supply/demand. While continuous pumping in of cadets has resulted in some balance in supply/demand of junior officers, due to which he said that BSM was looking to rationalise their wages, there is still a shortage of senior officers, hence there is limited room for reducing costs.

In the case of senior officers, many owners have taken a short term view and shifted to lower cost nationalities. "This may give short term relief, but is destructive in the long term," he warned. "It causes poaching between companies and wages to spiral up further as shortages increase."

He also said that it also gave rise to accelerated promotions, which sometimes resulted in incompetent, or inexperienced people in senior positions.

"What about retention? Would you agree that it has serious impact on crew costs?" he asked.

BSM's observation was that various benefits and a 'no blame' culture helped in retaining and growing talent.

"How about a talent pipeline? Do all companies have structured cadet plans and career development plans in place?" he also asked.

The simple truth is that if your people are happy to work with you, they will not auction themselves to the highest bidder in the market, Sharma advised.

Turning to travel costs, Sharma said these are the necessary cost of doing business.

They cannot be done away with, but can be reduced with better planning.

Expenses incurred in carrying out crew changes in faraway ports, having people wait in hotels for days, due to mis-planning are definitely avoidable. "In BSM, in addition to closely focusing on planning, we exclusively use the company's in-house travel company, whose very existence is offer maximum savings," he said.

Training questions

As for training, the number of incidents, accidents and damages continue to rise in the shipping industry.

"Is training a cost, or an investment? Is training an option, or a necessity? Are the basic STCW courses, or even additional technical training carried out by some good companies, sufficient?" he queried.

He explained that BSM has performance KPIs for both shore and ship staff and also operates training centres in five locations for continuously training the company's seafarers

“
The simple truth is that if your people are happy to work with you, they will not auction themselves to the highest bidder in the market
”

- Arvind Sharma, director of loss prevention and HR (Marine), Bernhard Schulte Ship Management

One of the company's key focuses is on soft skill training, dealing with motivation, teamwork, people management and personal pride and responsibility.

Another key focus is development and talent management. For example, not to allow cadets to be left to their own devices on board, not to allow cadets to be used as cheap labour but rather with a focus that they are BSM's management level officers of tomorrow.

Medical costs

Addressing P&I, Sharma said that the costs of medical treatment and repatriation can add substantial expenses to a company's opex. It is essential to have reliable, regularly vetted clinics for pre-joining medical examinations, Sharma stressed. It is also necessary to regularly monitor the P&I cases and effect adjustments in medical tests.

BSM has introduced enhanced pre-joining medical examinations. However, continuous training and a robust safety culture on board are invaluable to reducing injuries, he said.

Finally, he advised delegates that shipping

companies should have a structured cadet plan and a defined talent pipeline in place. "Have proper planning in place and maintain some flexibility in relief dates to keep travel costs in check," he said. "Training, or learning, is a necessary and ongoing investment. Focus more on soft skills and motivation. Reduce micro-management from shore and let the seafarers manage their vessels."

Having motivated and skilled people on board will automatically reduce operational costs and this should be the area of focus.

Regularly review the effectiveness of pre-joining medicals and effect changes in tests as found necessary, he concluded.

Capt KK Mukherjee, general manager (operations) NYK Bulkship (Asia), took a look at the market imbalances, competition, change management and achieving operational excellence.

He said that if shipping companies can sustain their operations during a tough market, such as seen today, then they should be set fair for the market upturn. However, he was slightly concerned as to the number of MR



The delegates listen intently to learn how to keep costs under control.

newbuildings being placed at present.

In a wide ranging talk, he described the commercial operations of a vessel being in the hands of the owner/operator with the manager having access to a chartering and operations desks.

On the other side of the fence is the charterer who might have a trading bench and will have chartering and operations desks. There is also the cargo seller and buyer, plus the receiver with the terminal's interests also taken into account at the loading and discharging functions.

They are all important roles, which have to be co-ordinated in order to conduct a voyage to the satisfaction of all parties and in a mood of mutual co-operational, which in turn will lead to greater efficiency.

Unfortunately, all the stakeholders tend to look at deficiencies with the vessel, rather than with themselves for greater efficiency, he said.

He continued by describing pre-fixture work as probably dealing with Q88, oil major acceptance, terminal questionnaires, load and discharge ports' acceptance conditions, the charterparties and contracts.

Acceptance variances

Here, the oil majors and terminal operators have different acceptance parameters, which could lead to a tanker being accepted by one, but not the other. "You don't know why a vessel gets rejected. Sometime it's just a matter of interpretation," he remarked. "Looking into each step is a challenge."

Taking charterparties as an example, he said that vital clauses could be missing, or wrongly interpreted, which could lead to claims against the owner.

As for the equally important post-fixture work, this could include cargo nominations; stowage plans (tanks); tank cleaning and preparation; voyage dissemination (eg speed and consumption); agency fees and disbursements; cargo carriage; loading/discharging; documents/bill of lading; post voyage calculations, including demurrage; claims recovery; cargo heating management and avoiding claims/loss prevention.

He said that those persons involved in post-fixture work sometimes have little knowledge of shipping. Procedures have to be developed, however, he thought that some people had not bought into this route to efficiency. "The critical issue is that each voyage must be analysed," he said. "How can we do better, in which areas are we going wrong?"

In some cases, cargo nominations were not specified until the last minute making tank

cleaning and preparation difficult, which could cost owners money. Loading and discharging should be conducted in a professional manner, he warned.

He also said that some Masters have little business knowledge when confronted with the charter documents, but they should not be blamed. The documents should reflect the clauses on the charterparty, but the Master might not be aware of any differences.

The fundamentals for any shipowner were for the vessels to be on time, the voyage to be undertaken as contracted and as desired by the charterers, plus at minimum costs. There should be a good relationship with the charterers with reasonable co-ordination of projects. "The two must dovetail," Mukherjee said.

His corporate philosophy is summed by the three 'i's' - innovative, integrity and intensity - while not losing the competitive edge.

He said that the shipping industry is going through a period of change with both micro and macro developments occurring. "It is the management of change which is the biggest challenge," he said as companies strive for operational excellence.

The drive for vessel efficiency was one and another was the change in vessel ownership with more independent owners, banks and finance houses becoming involved in shipowning, plus the greater use of pools to commercially operate tankers. In oil supply, there is also the shift away from OPEC producing countries.

Conservative approach

He described NYK as being a bit conservative in its approach to the new systems coming onto the market claiming to enable a vessel to operate with greater efficiency, to save fuel and emissions. Some of the new technologies/equipment available are not mature systems, he claimed.

However, some technologies have been introduced including SCRs, plus electronically controlled main engine and lubrication systems, among others.

The quantifiable operations that can be performed include slow steaming to minimise losses, performance analyses, weather routing and optimisation.

NYK Bulkship is a member of the Maritime Port Authority of Singapore's Green Ship Programme and has a strict in-house emissions control and energy conservation programme across its diverse fleet.

The company set out to reduce 10% of CO2 emissions by 2013 from a 2006 baseline. The results are that by 2010, the reduction had



Capt KK Mukherjee.

reached 9.2%, by 2011 it had reached 13.8%, by 2012 it had gone up to 14.6% and thus far this year, the reduction had reached 15.8%.

The target has since been increased by a 10% reduction from fiscal 2010 levels by fiscal 2015. From April 2012 to March 2013 (the fiscal year), the company had saved 205,964 tonnes of fuel, Mukherjee claimed.

NYK has its own vessel recycling policy, which aims to 'secure stable space for vessel recycling' and to 'ensure green demolition', he said.

In summary, Mukherjee said that his own wish list included –

- Better co-ordination.
- A more professional outlook.
- Even standards of terminal/oil majors/charterers.
- Clarity in charterparties.
- Mechanism of freight rates – matching market economy.
- SOP for traders/brokers/charterers –settling claims & payments to owners.
- Serious & committed owners.
- Soft landing of regulations.

He also said we also need to do away with the notion; "It's not my problem, it's somebody else's problem."

Addressing MLC

Changing the subject completely, Chris Metcalf, partner with Clyde & Co, gave a talk on 'getting to grips with the Maritime Labour

Convention (MLC)'. Singapore is already a signatory to the Convention.

He explained that fundamentally, the MLC involved any person who is engaged in, or works in any capacity on board a vessel.

It also applies to a shipowner, or another organisation, such as manager, agent, or bareboat charterer, who has assumed the responsibility of the ship from the owner and who has agreed to take on the duties and responsibilities under MLC, he explained.

MLC's minimum requirements covers conditions of employment, vessel accommodation, recreation, food and medical requirements, plus others. It also covers financial security in the case of abandonment, injury, or death.

In order to be in compliance, those with responsibilities should check that all the documentation is in order, including the certification for the flag state, an effective complaints procedure is in place and that the charterparty terms have been checked where relevant.

He gave an example of a timecharter under a Shelltime 4 form under the clause -

SEAWORTHINESS - Owners obligation - (absolute, or due diligence) to provide a seaworthy vessel. eg SHELLTIME 4: 1(c) ; 1(g) "1(g) she shall have on board all certificates, documents and equipment required from time to time by any applicable law to enable her to perform the charter service without delay;..."

DEFICIENCY OF CREW - Owners obligation to provide full complement of officers and crew: eg SHELLTIME 4: "2. (a) At the date of delivery of the vessel under this charter and throughout the charter period: (i) she shall have a full and efficient complement of master, officers and crew for a vessel of her tonnage, who shall in any event be not less than the number required by the laws of the flag state and who shall be trained to operate the vessel and her equipment competently and safely;..."

Failing either of these clauses could lead to reduced hire under clause 3(b).



BSM's Arvind Sharma addresses the audience.

Under the **DUTY TO MAINTAIN VESSEL** clause Due Diligence 3(c) - Charterers notice in writing; 30 days to remedy, or off hire 3(d) - If the vessel fails a Port State Control (PSC) inspection, owners must notify charterers 3(e) - If the problem prevents normal commercial operations, the vessel could again be offhire.

Under **TERMINATION** again eg SHELLTIME 4: "3(f) Furthermore, at any time while the vessel is offhire under this Clause 3 (with the exception of Clause 3(e)(ii)), Charterers have the option to terminate this charter by giving notice in writing..." TIME ADDED TO CP PERIOD, eg SHELLTIME 4: "4(b) Any time during which the vessel is offhire under this charter may be added to the charter period in charterers' option..." And clause 21 (e).

Turning of voyage charters, Metcalf said that in the Seaworthiness clause, owners were under the same obligations to make the vessel seaworthy. He pointed out that any demurrage due will not be paid if the delay is due to the fault of the shipowner - eg for failing a PSC inspection.

Tackling the issue of who pays, he said that the direct costs of implementing MLC comes in the form of management time, additional crew if needed on better terms,

additional insurance, etc.

Under existing charterparties, the owner cannot increase a vessel's hire, while there is a threat of fines, delays and detentions and there is the threat of damages caused by a charterparty breach, for example offhire, while charterparties can be terminated, or even extended at owners' cost.

A shipowner is the party ultimately responsible for MLC compliance but what if a fine, detention, etc is due to charterers' employees, or servants? For example, the act of stevedores, pilots, surveyors and/or supernumeraries.

A possible solution is change the flag state to one, which has not ratified the convention. Metcalf warned that under the principal of 'no more favourable treatment' adopted by PSC, a vessel owner should say "NO" to this option.

Another solution is to amend the charterparty to allocate the risk. Here, concerns have already been expressed to BIMCO, particularly over the MLC definition of a 'seafarer'.

In turn, BIMCO has formed a working group and new recommended clauses were published in June of this year.

In its SUPPLYTIME form, BIMCO defines the MLC and defines the charterers' personnel. Other changes include -

- Owners are to provide a copy of DMLC Pt 1 to the charterers.
- Charterers responsible for ensuring compliance as applicable to the vessel and as it may apply to the charterers' personnel.
- Charterers on request to provide evidence of compliance.
- Charterers indemnify owners.

Although designed for the offshore sector, this charterparty containing these clauses can be adapted, or BIMCO ISP wording can be used, Metcalf advised.

“

A shipowner is the party ultimately responsible for MLC compliance but what if a fine, detention, etc is due to charterers' employees, or servants?

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