TANKER Operator

JANUARY/FEBRUARY 2011

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- Denmark- pools or no pools
- EEDI will not work
- Tanker stability policed
- eDocs comes of age
- Gas powered VLCCs?
- ECDIS unwrapped

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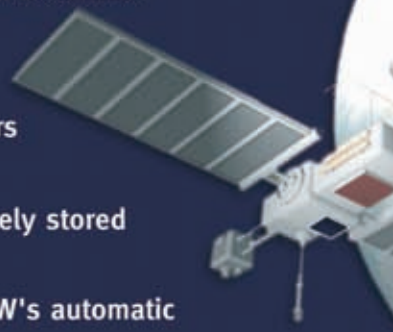

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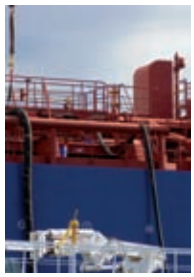

Front cover photo
Bunkering a tanker. Could we soon sea LNG going up the hoses into tankers (see page 29)? Yes, if DNV's predictions prove to be correct. The class society said that it would not take much to modify a bunker barge to carry natural gas and distribution points could be installed near the main LNG export and import terminals without too much trouble. Photo credit- NORDEN.

The Gospel according to BP

World energy growth over the next 20 years is expected to be dominated by emerging economies, such as China, India, Russia and Brazil.

Improvements in energy efficiency measures are also set to accelerate. This is according to BP's latest projection of energy trends, the BP Energy Outlook 2030.

BP's 'base case' - or most likely projection - points to primary energy use growing by nearly 40% over the next 20 years, with 93% of the growth coming from non-OECD countries. These countries are seen to rapidly increase their share of overall energy demand from just over half currently to two-thirds.

Over the same period, energy intensity, a key measure of energy use per unit of economic output, is set to improve globally led by rapid efficiency gains in the same non-OECD economies, under these projections.

According to the BP Energy Outlook, diversification of energy sources increases and non-fossil fuels (nuclear, hydro and renewables) are together expected to be the biggest source of growth for the first time. Between 2010 and 2030, the contribution to energy growth of renewables is seen to increase from 5% to 18%.

Natural gas is projected to be the fastest growing fossil fuel, and coal and oil are likely to lose market share as all fossil fuels experience lower growth rates. Fossil fuels' contribution to primary energy growth is projected to fall from 83% to 64%. OECD oil demand peaked in 2005 and in 2030 is projected to be roughly back at its level in 1990. Biofuels will account for 9% of global transport fuels.

BP's 'base case' projections are that world primary energy demand growth averages 1.7% per year from 2010 to 2030 although growth decelerates slightly beyond 2020. Non-OECD energy consumption will be 68% higher by 2030 averaging 2.6% per year growth, and accounts for 93% of global energy growth. In contrast, OECD growth averages 0.3% per year to 2030; and from 2020 OECD energy consumption per capita is on a declining trend of -0.2% per year.

Transport growth is seen to slow because of a decline in the OECD.

OPEC's share of global oil production is set to increase to 46%, a position not seen since 1977. At the same time, oil - and gas - import dependency in the US is likely to fall to levels not seen since the 1990s, because of improved fuel efficiency and the increased share of biofuels. Global consumption growth is also impacted by higher oil prices in recent years and a gradual reduction of subsidies in oil-importing countries.

The fuel mix changes over time, reflecting long asset lifetimes. Oil, excluding bio-fuels, will grow relatively slowly at 0.6% per year; natural gas is the fastest growing fossil fuel with more than three times the projected growth rate of oil at 2.1% per year. Coal will increase by 1.2% per year and by 2030 it is likely to provide virtually as much energy as oil, excluding biofuels. The strong carbon policy drive in OECD countries risks being more than offset by growth in emerging economies.

Global liquids demand is forecast to reach 102.4 mill barrels per day in 2030. The net growth of 16.5 mmbpd over the next 20 years comes exclusively from the emerging economies of the non-OECD. "Non-OECD Asia will account for nearly two-thirds of non-OECD consumption growth over the next 20 years and more than three-quarters of the net global increase, rising by nearly 13 mill barrels a day," BP said.

The largest increments of new supply will come from OPEC - conventional crude in Saudi Arabia and Iraq, as well as OPEC natural gas liquids (NGLs) which are not subject to OPEC quotas.

According to the Energy Outlook's projections, oil continues to suffer a long run decline in market share, while gas steadily gains share. Coal's recent gains in market share, on the back of rapid industrialisation in China and India in particular, are reversed by 2030, with all three fossil fuels converging on market shares around 27%.

The diversifying fuel mix can be seen most clearly in terms of shares of growth. Over the period 1990-2010 fossil fuels contributed 83% of the growth in energy; over the next 20 years fossil fuels are likely to contribute 64% of the growth.

"The diversifying fuel mix is being driven largely by developments in the power sector. Energy used to generate power remains the fastest growing sector, accounting for 53% of the growth in primary energy consumption 1990-2010 and projected to account for 57% of the growth to 2030. In terms of end use, industry drives the growth of final energy consumption.

"The role of transport is weakening; over the past 20 years transport sector energy demand grew at about the same rate as total energy demand, but over the next 20 years it grows much less rapidly than total energy.

"OECD oil demand declines are concentrated primarily outside the transport sector, where it is relatively easier to displace oil by gas and renewables; post-2015, OECD transport demand is also expected to fall as technology and policy drive improved engine efficiency," BP said. TO

TANKEROperator

Vol 10 No 3
Tanker Operator Magazine Ltd
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A few thoughts on the large tanker market

According to Gibson Research, at present the age profile of the VLCC market is extremely unbalanced. Last year saw 56 VLCC deliveries, while only 30 vessels exited the fleet through scrapping and conversions.

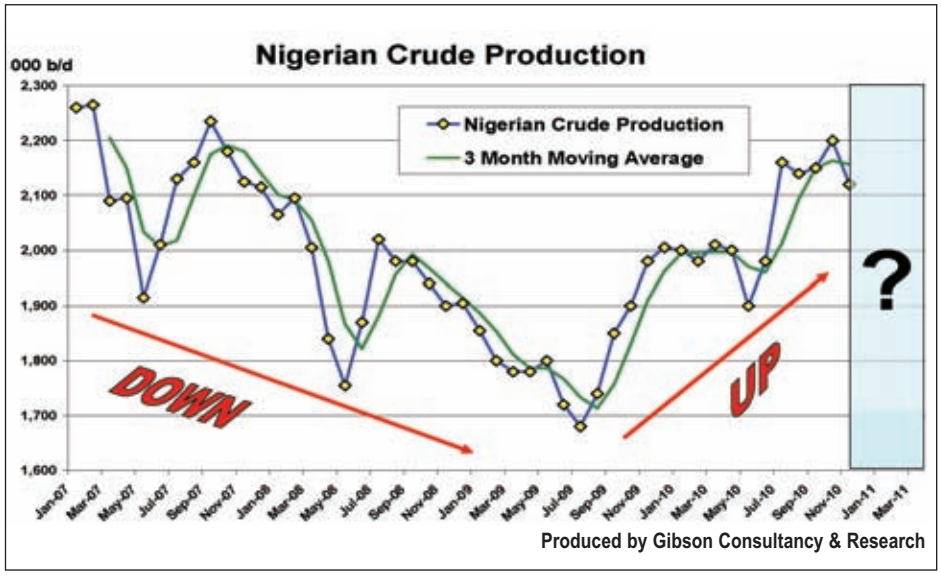
As exciting as the phase out of single hull fleet might have been, it has not changed the ugly fact that VLCC tonnage is growing too fast in an already oversupplied market. This trend is about to get worse, due to the young age profile of the existing double hull VLCCs, as out of 507 vessels currently trading, more than two thirds are under 10 years old.

The chances of younger VLCCs ending up on a beach are very low, because even in a tough market the asset value of a 10-year old VLCC will be significantly higher than revenue generated from a demolition sale. Only 40 (8%) vessels are in the 'vulnerable' age of 15-20 years old. In contrast, there are 187 VLCCs on the orderbook, with around 60 expected to be delivered this year. Hence, the double hull VLCC fleet is likely to grow by another 10% in 2011 alone.

The painful question now is will the newly delivered VLCCs have enough cargoes to fully break even? The answer for this year is probably not. The total expenses, including capital and fixed operating costs of running a brand new VLCC is about $50,000 per day. Current TCE earnings on the benchmark VLCC route TD3 (ME Gulf – Japan) are just above $17,000 per day at the beginning of January, Gibson Research calculated.

Considering that the tanker fleet is growing faster than world oil demand, a long-term jump in rates in the next 12 months is very unlikely. Moreover, due to continuing oversupply of tonnage, the rivalry for available cargoes could intensify, putting additional downward pressure on spot rates. Hence, any hopes of getting a full return on investment on a newbuilding VLCC will probably not occur in 2011.

However, the long-term outlook seems to be much brighter. There are strong projections for oil demand growth in the next four years. This will be coupled with a higher demand for long haul crude transportation, due to forecasted increase in OPEC production.



These positive developments may eventually soak up the expanded VLCC fleet. Until then some of the new VLCCs may try to enjoy their 'student' life, being unemployed but with good prospects, Gibson said.

Nigeria – what next?

Turning to the situation in Nigeria, Gibson suggests that the oil exporter could either be a threat, or an opportunity, as for years the Nigerian energy sector has been hampered by violence and attacks on its oil infrastructure.

The country's crude production was severely affected, with output falling to a low of 1.68 mill barrels per day in July 2009, some 0.79 mill barrels per day below the highest level since 2000.

As Nigerian crude is predominantly destined for the US and Europe - 66% going to the US and 30% to Europe - such a sizeable drop in Nigerian production drastically limited the country's exports to these regions. Yet, it went unnoticed by the global energy markets, as at the time the world economy was in severe recession.

For the tanker markets, on the contrary, this was a big blow, as vessels trading in the region had to deal not only with the weak chartering demand but also rising tanker supply.

The relief in the Nigerian energy sector came following the amnesty deal arranged with militants in the second half of 2009. Crude production bounced back to around 2.15 mill barrels per day in the third quarter of 2010, up by 0.47 mill barrels per day compared to July 2009. This generated extra crude export demand out of the country equal to roughly one Suezmax every two days, or one VLCC every four days.

However, at present there are renewed concerns about stability in the region, with a number of attacks by a dissident faction within the Movement for the Emancipation of the Niger Delta (Mend) and other groups. So far disruptions have been fairly limited. However, the Mend faction has recently warned that it will soon start "an all-out attack on oil installations across the Niger Delta," Gibson said.

On this basis, there is a significant risk of renewed disruptions to the oil infrastructure. If this is the case, then it will once again reduce exports of light Nigerian crude to US and European customers and so create downward pressure on the local market for crude tankers.

Yet on a global scale, the impact on the tanker market is more difficult to measure, as we are in a world of rising oil demand and these 'lost' barrels will have to be delivered from somewhere else. As most of the world's spare capacity is located in the Middle East, the region is a good candidate for the extra barrels needed. And although the heavy Middle East crude is not a like-for-like substitute for light Nigerian blends, the lack of spare capacity outside OPEC means that the decline in Nigerian exports would eventually lead to a more longer haul Middle East crude trade. TO

"The painful question now is will the newly delivered VLCCs have enough cargoes to fully break even? The answer for this year is probably not."

AET accepts 59th Aframax

AET – one of the world's largest tanker owner/operators – took delivery of its 59th Aframax at a naming ceremony held on 19th January.

The new vessel, *Eagle Kinabalu*, was formally delivered by Tsuneishi Shipbuilding Company and is the fifth in a series of eight Aframaxes currently being built for AET by the Japanese yard.

Presiding over the naming ceremony was AET president & CEO, Hor Weng Yew, who said: "The delivery of this new vessel represents our continued commitment to growth in the tanker sector. Today, our tanker fleet is one of the largest in the world and includes VLCCs, Suezmax, Aframax and product tankers, serving more than 80 customers in every corner of the globe. This remarkable achievement has been made possible by the support of some very important, long-term customers and Petronas is one of our most long-standing and valued relationships."

He added: "Looking forward to the early days of this new ship, I can't pretend that this is going to be an easy time for ship operators such as ourselves. The outlook for tanker freight rates remains bleak, with some degree of upturn not expected in the immediate future. But sometimes difficult periods present opportunities and we are using this time to focus on improvements to our operational efficiencies, to drive out cost savings where that makes sense and to structure the business for the future. We will also continue to invest in new vessels, and I am proud to say that AET will take delivery of a further 17 crude and clean tankers over the next three years."

***Eagle Kinabulu* entered the market at a difficult time.**

Eagle Kinabalu was the 83rd vessel to join the AET fleet, which comprises 13 VLCCs, 59 Aframaxes, one Suezmax, one Panamax and nine clean tankers. AET has a further 17 vessels on order.

The company is headquartered in Kuala Lumpur, with commercial centres in Singapore, London, Houston and Gurgaon (India), together with a specialist offshore lightering unit in Galveston, Texas. AET is a wholly-owned subsidiary of Malaysian energy logistics group, MISC Berhad. TO

Shipping is facing up to a challenging year

The shipping sector faces a challenging 2011, with freight rates under pressure, crew costs continuing to rise and the banks closely monitoring the future viability of poor performers.

Writing in the latest issue of Moore Stephens *Bottom Line* shipping newsletter, Julian Wilkinson, head of the shipping industry group, said, "Last year should have been the year that future generations would use to frighten their children into believing that, unless they ate their greens, they would suffer the privations that were visited upon shipping. The truth was somewhat different.

"The shipping markets continued to be challenging in 2010 because, despite positive signs on the demand side, surplus tonnage, a lack of funding, a continuing glut of newbuildings and fierce competition led to downward pressure on freight rates. But confidence levels in the first half of the year still reached 18-month highs, not bad for an industry that was supposed to be ailing. Owners started to think about new investments, and about finance costs coming down. Confidence suffered a minor wobble towards the end of the year, but 2010 still closed on talk of IPOs, strategic acquisitions, joint ventures and major investments.

"That confidence should be sustained this year, building on the general forbearance shown by the banks in 2010 when assessing non-performing shipping loans. But we can expect to see the banks commission more independent business reviews to assess the future viability of poor performers."

Wilkinson added, "Crew costs will continue to rise. They were the only operating costs going up in 2009, will have done likewise in 2010 and will continue to do so in 2011. An executive at a leading shipping line recently welcomed a strong increase in revenue for the first nine months of last year and urged his crews to celebrate by eating cream cake. This didn't go down well with the unions, who claimed that the results had been achieved through job cutbacks. You can't eat your cake and have it.

"The emphasis this year will be on keeping the cash flowing. The banks know that shipping operations with strong leadership, governance and risk management that have survived the downturn deserve continuing support. They will listen to those with robust investment plans, who in turn will be encouraged by low interest rates.

"Despite continuing concern over the level of newbuildings, it has been suggested that shipping could be back to strength in another two years. By then, there should be more bread to go round, and no need to eat cake. Prudent owners will keep their bankers sweet and their financial advisers close at hand," he concluded. TO

Make 2011 a record year

Make record keeping your New Year's Resolution said Videotel.

The company urged shipping companies to use its updated online records management tool, which it claimed simplified training records between ship and shore.

Videotel's Stephen Bond.

At the start of 2011, Videotel said that more than 52,000 crew and 1,600 ships were using its webFTA (Fleet Training Administrator) system, which offers an on-line, custom-made solution for keeping track of all training records.

Stephen Bond, Videotel deputy chairman, said: "In today's litigious climate with seafarers so easily criminalised for perceived infractions, it is even more important to ensure that crew receive the most relevant and necessary training for their roles and for companies to have comprehensive records to demonstrate that appropriate training and qualifications have been achieved.

"Our webFTA system simplifies the process of monitoring individual employees' training to help crew and ship managers to be certain that their staff are up to the job," he concluded.

WebFTA, is the latest in records management systems, offering an online solution, which enables access to seafarer's results and performance from anywhere there is internet access. It allows access to all training records across the fleet and offers a variety of data assessments tools to make life easier. It provides an effective way to schedule rank-specific, statutory and non-statutory training, create reports, upload certificates and on-shore data, Videotel said.

With Videotel's webFTA system training administrators and managers can:

- Track training on board.
- View a crew member's individual training record to see what training is missing.
- Receive alerts when training has not been received.
- Add certificates and on-shore data.
- Set rank-related pass rates.
- Schedule frequency of rank-specific training and export to ships.
- Schedule statutory and non-statutory on-board task.
- Create more than 20 styles of reports.
- Export reports for further analysis within other software packages.
- Works in harmony with its partner program Onboard Training Manager Plus (OTM+).

The software works from a centralised database. This simple-to-use system not only saves time tracking crew training and processes audits quickly but also helps show adherence to the ISM Code. WebFTA also allows onshore training managers to view all ships and see what training is being done and, importantly, what is not being done, the company said. TO

Tankers play an ever increasing role in Danish controlled fleet

Danish shipping companies' total foreign currency earnings continue to increase and will probably reach DKK170-180 bill for 2010, reportedly said Danish Shipowners' Association (DSA) chairman, Lars Vang Christensen of Herning Shipping, in a New Year's statement.

Figures produced by the DSA showed that by the end of 2009, the fleet had reached a record 13.5 mill dwt, representing more than 550 vessels. At the end of that year, shipping companies' investment programmes totalled more than DKK60 bill amounting to around 275 vessels of 11 mill dwt. However, virtually no orders were placed in 2009, or have been since, except for smaller domestic vessels.

Many Danish tanker owners are by and large supporters of the pool concept with several companies participating in mainly product and chemical carrier pools, which provides domestic owners with larger operating volumes, which in turn leads to larger commercial shoreside operations.

Since the beginning of the crisis at the end of 2008, the Danish fleet has increased by 46 vessels or 1.4 mill gt. The first nine months of 2010 accounted for 28 new vessels of 500,000 gt. The largest vessel types delivered were tankers, in which Denmark plays an increasing role, including Danish owned and flagged and chartered in vessels.

Despite the downturn, shipping remains the largest Danish export market and continues to grow.

By October last year, Denmark's owned fleet equalled 1.2% of the world fleet, making it the 17th largest. Taking into consideration those controlled by Danish concerns flying foreign flags, this brings the total up to 23 mill gt and 9th in the world ranking. Adding the chartered in tonnage to the total, Danish owners control more than 1,500 vessels of 41 mill gt, transporting about 10% of the world's seaborne trade.

Despite the number of new orders almost drying up, as of 1st October, Danish owners still had 243 vessels totalling 6.2 mill gt on order. Of these 22 vessels were contracted last year. However, the later contracts were mainly for local vessels, such as ferries.

As for tankers, the Danish portion in this sector stood at nearly 4 mill gt last October, which was 35% of the total – the highest tonnage level since records began in 1992.

The DSA is also responsible for the provision of funds for a common recruitment campaign under the 'Blue Denmark' banner, which has been ongoing since 2006. It was realised from the outset that the number of qualified applicants for on board training positions needed to be increased and despite the recent cutbacks, the campaign is still ongoing. Targets set by parties involved in 'Blue Denmark' for enrolment on training/educational programmes were achieved in 2009, the association claimed.

At the beginning of October, 2010, Danish shipping companies employed around 25,000 of the 100,000 employed in the Danish maritime cluster.

> Danish shipowners are [also] truly committed to take responsibility to further lower global CO2 emissions and we realise that it cannot be done by technical measures only; therefore the DSA finds it necessary to commit to an international market based regulation.

Among the more prominent DSA tanker members are AP Moller-Maersk, TORM, NORDEN, Erria, J Lauritzen, OW Tankers, Uni-Tankers, Nordic Tankers and Herning Shipping. Associate members in the tanker sector include Clipper, Camillo Eitzen, Dannebrog and DIFKO.

Market-based instruments

For several years, the Danes have championed the establishment of a global market based instrument for regulating CO2 emissions from international shipping.

At the 2010 AGM, Christensen, the newly elected DSA chairman said: "Danish shipowners expect to reduce CO2 emissions by technical measures with 15% by 2020 on average compared to 2007. However, Danish shipowners are also truly committed to take responsibility to further lower global CO2 emissions and we realise that it cannot be done by technical measures only; therefore the DSA finds it necessary to commit to an international market based regulation.

"The basic approaches of establishing an emission trading scheme or some kind of greenhouse gas contribution fund have been studied carefully. These approaches have many fundamental and practical elements in common. To ensure environmental effectiveness and to avoid distortion of competition it is essential that the instrument applies globally to all ships regardless of flag. It appears that the current Danish proposal on a greenhouse gas contribution fund will be the most transparent and easier to understand and administer, it will provide certainty on cost to the shipping industry and it will without any doubt influence environmental behaviour positively," said Christensen.

At the time, the DSA said that it strongly supported the ongoing deliberations at the IMO and would welcome an early international agreement on the more market-based CO2 reduction systems in order to secure the best possible result from December 2009's COP-15 in Copenhagen in relation to the future IMO work.

In his 2011 speech, Christensen also touched on other major challenges, which include the reduction of the sulphur emissions in the North Sea and the Baltic Sea, where the DSA in a partnership with the Danish environmental authorities tries to maintain that all interested parties keep active, so as to secure a sustainable 90% reduction in current sulphur emissions.

Shipping also has other challenges, especially the increasing pirate activity off Somalia, which is a growing problem. The international society has to make a further effort so as to prevent criminal activities causing instability in the entire Indian Ocean and for all the East African countries.

The shipping fraternity has for a long time pointed out that the UN should establish a local coast guard, which could protect the vessels servicing Africa's foreign trade.

To counteract the threat of piracy, for the first time, the Danish Ministry of Justice recently approved the use of armed guards on board a Danish vessel.

According to Danish press reports, the vessel in question, the TORM-owned 47,000 dwt MR *Torm Kansas*, was attacked by pirates near Mombasa in November last year. After the attack, owner TORM felt it unsafe to let the crew and the vessel sail in pirate infested waters, so the company asked the navy for help.

The Danish navy, whose units participate in the international anti-piracy fleet, opted not to escort the vessel. As a result, TORM asked for approval to sail with armed guards, which was granted.

However, the DSA had reservations about this trend. "This is a new creation and it is something which is only to be used in extraordinary situations, where we cannot get help from the navy, or from another source," Jan Fritz Hansen, DSA executive vice president reportedly said. TO

To pool, or not to pool

Denmark has been and still is home to various tanker pools, which have expanded down the years, as the concept of tonnage sharing became ever more popular.

Maersk, NORDEN and TORM led the way by forming large tanker pools with various partners. However, TORM has recently announced that it is withdrawing from its pooling arrangements, but said its decision was not based on the fact that it lost several pool partners to a rival last year.

The existing pool players have since been joined by newcomers Hafnia and Nordic Womar – the latter being a joint venture between Nordic Tankers and Womar Logistics.

The idea of the pools is to specialise in tankers of the same type, from LR2s to small chemical carriers and have enough vessels to offer charterers flexibility of vessel availability, while operating the vessels in a commercially cost effective way. There is a wealth of tanker commercial, as well as technical expertise in Denmark, especially in the Copenhagen area. Some of the senior management have broken away from the large shipowners to form their own enterprises.

Maersk operates some of the largest pools with three distinct brands – an LR2 pool, the 100% managed Handysize and MRs in the 100% managed Handytankers pool and Intermediate tankers, which were enhanced through the acquisition of Broström in 2009.

The Maersk LR2 pool is claimed to be the world's largest commercial operator of coated Aframaxes and is large enough to cater for contracts of affreightments (COAs), according to Maersk Tankers. Handytankers is a larger pool of more than 125 vessels ranging from 27,000 dwt to 51,000 dwt. Its members include Maersk Tankers, Seaarland, Motia, Chemikalien Seetransport, Marwave Shipmanagement and d'Amico, plus the recently acquired Broström vessels falling into that size range.

The smaller Broström units have joined the Intermediate tanker operation, which caters for vessels ranging from around 7,000 dwt to 17,000 dwt and was set up by the acquisition of Broström, who know manages the operation from Gothenburg and Singapore.

As for Nordic Tankers, this is a Danish shipping company listed on the OMX Nordic Exchange and headquartered in Copenhagen. A major boost to the company occurred in January 2010, when Clipper became its largest shareholder.

This relative newcomer owns, wholly or in part, 15 tankers and operates about 55 chemical tankers. The chemical tankers are in the range of 3,500-25,000 dwt and Nordic Tankers handles commercial operations, plus a major part of the technical management, the company said.

The product tankers are in the LR1 and the handysize sectors and are operated in two pools, which also include vessels from other shipping companies. The two pools are commercially managed by Hafnia Management and Maersk Tankers.

Nordic Womar formed

In January of this year, it was announced that Nordic Tankers and Womar Logistics were to establish a jointly owned independent pool management company going by the name of Nordic Womar, starting operations on 1st February.

Nordic Womar will initially manage two pools of coated chemical tankers totalling about 40

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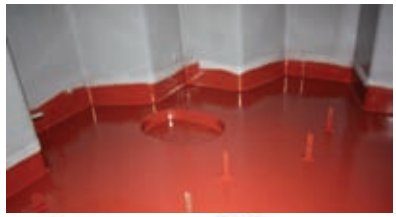

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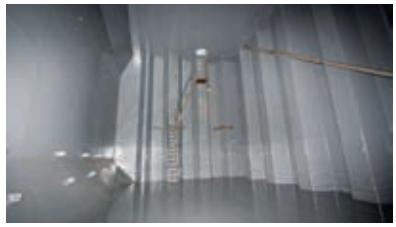

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TORM has reportedly withdrawn its vessels from pooling agreements.

vessels in the 10,000 dwt to 25,000 dwt sector.

This new arrangement is a continuation of the joint marketing agreement that commenced 1st June 2010, under which Nordic Tankers and Womar started to market each others' coated chemical tankers of between 10,000 dwt and 17,000 dwt in their individual areas of primary commercial strength. For example, the agreement combined Nordic Tankers' strength in the West with Womar's strength in the East, the companies said.

This enabled the operators to offer an integrated global service for their customers with increased efficiency and utilisation of ships under management, Nordic Tankers said at the time.

Based on constructive co-operation in this initial phase, the entering into a joint pool management arrangement was a natural next step. Both parties agreed to increase the range of vessels on offer up to 25,000 dwt.

With the establishment of the jointly-owned pool, Nordic Tankers will operate a total of about 100 vessels in the chemical tanker segment, combining the fleet already under operational management with the fleet of Nordic Womar.

"This agreement is in line with our strategy of prudent and profitable growth with a target of operating more than 150 vessels in 2013. Apart from further combining the strengths of Nordic Tankers and WOMAR and creating critical mass, it is a significant and concrete result of our growth efforts and a perfect match to the part of our strategy concerning the establishment and operation of pools" explained Nordic Tankers CEO Tommy Thomsen.

"Nordic Tankers' well known presence in Western markets and this joint pool company will further enhance our services to our customers providing efficient access to the global markets," explained Womar CEO Hans van der Zijde

Thomsen has taken on the role of Nordic Womar's chairman, while van der Zijde is the new CEO. The company is managed out of Singapore.

Nordic Tankers has offices in Copenhagen (headquarters), Stamford (Conn), Houston (Texas), Bogota (Colombia) and Riga (Latvia) and has about 130 employees. As for Womar, this is a privately owned company with its head office in Singapore. The company currently operates three commercial pool's - Marida, Yamuna and Ganges - with a fleet of about 40 chemical and product tankers below 20,000 dwt.

Womar also has offices in Mumbai (India) and London (UK) with about 37 employees in total. Two of these pools are now managed by Nordic Womar, whereas the pool with tonnage outside the scope of the co-operation agreement will continue to be managed by Womar, the company said.

Two newcomers

Last year saw the establishment of two tankers companies in Copenhagen – Hafnia Management and Tankers Inc, both of which were started by former TORM senior management.

Hafnia Management was established by Lars Mossberg's Marinvest tanker concern. Today it operates as a commercial management company with seven partners operating two pools.

The MR pool consists of IMO II/III product tankers controlled by Rederi AB Gotland, J Lauritzen Tankers, LGR di Navigazione and Kirk Capital, some of which are ice strengthened. The LR1 pool's members include Marinvest, Rederi AB Gotland and Nordic Tankers.

Led by CEO Anders Engholm, Hafnia currently employs 16 persons having more than 250 years shipping experience. The company uses the name Hafnia Tankers in its day-to-day commercial operations.

Engholm told *Tanker Operator* that the goal was to build up the pools into 30 plus vessels each to give Hafnia more purchasing power to negotiate discounts on an economy of scale basis. Indeed eight more newbuilding MRs are still to come. He described the pooling arrangements as "…a true partnership model where the owners help each other to achieve a true cost consolidation."

Once a 'critical mass' of tonnage was established, Hafnia would then look to secure COAs, possibly this year Engholm explained. He also said the company operated on a net commission basis rather than the more normal gross commission. This results in Hafnia taking a tight control over its own costs. "We run the entire operation as smooth as possible, the lower the cost the better for the customers and partners," Engholm explained.

At the end of January, Hafnia took over the commercial management of two Prime Marine Management LR2s, which were previously on bareboat charter to OSG. They are being marketed separately from the two pools.

In January, it was announced that Lauritzen's 53,540 dwt MR *Freja Scandia* had been sold to Kirk Capital for $40 mill and renamed *Christina Kirk.*

Financial backing

One company that will not be getting into pooling arrangements is Tankers Inc.

Tankers Inc was formed around August last year to focus on the ownership and chartering of tonnage in the product tanker segment. Its remit will include timecharters, newbuildings and secondhand purchases and will build its business on the back of an ultimate investment portfolio of $400 mill.

In addition, the team will evaluate opportunities to buy existing companies and fleets, plus other strategic initiatives within its core segment, which will deliver an appropriate return on capital for its shareholders.

CEO Mikael Skov said last year when the company was founded: "The product tanker industry is looking very interesting because of our long-term view of positive developments in the global supply and demand environment. In light of the recent financial climate, the timing to invest in the segment is ideal and there are attractive opportunities for asset acquisition and timecharters.

"I am very excited to be able to use my 25 years of experience in the industry to build a successful, global product tanker business," he said.

Tankers Inc is backed with a 'line of equity' from Barclays Natural Resource Investments, a division of Barclays Capital, the investment banking division of Barclays Bank Plc, as well as private investors and last year was finalising terms with industrial investors.

Skov told *Tanker Operator* in January: "We are up and running and have now fully established the internal infrastructure, which is always a bit more time consuming than one expects.

"We have not bought, or chartered any vessels yet as we have felt the prices were too high compared to the underlying freight earnings. We will be focusing on the product tanker segment, primarily MR and LR1 vessels and expect to see more reasonable pricing on assets and timecharters during the course of 2011."

"We do not expect to establish any pools etc. so will not be in competition with neither TORM nor Hafnia," he explained. TO

Leading shipping organisation sets the agenda

Well known for its contractual documentation, BIMCO regularly updates its charter and sales forms as the shipping industry continues to evolve.

One of the latest revisions concerns the Saleform 1993. Following industry consultation, during the summer of 2010, BIMCO and the Norwegian Shipbrokers' Association (NSA) decided to revise the industry's standard international contract for the sale and purchase of vessels, SALEFORM 1993.

While the general view of the industry was that this contract works very well – it was acknowledged that some provisions are often subject to amendment. The objective of the revision will be to address these issues while maintaining the fundamental principles of the SALEFORM.

Both BIMCO and the NSA have formed sub-committees composed of international experts with commercial and legal expertise in ship sale and purchase with the aim of completing a revision of the form by the autumn 2011.

According to BIMCO deputy secretary general, Soren Larsen; "SALEFORM 1993 is the universally accepted standard form for the sale and purchase of secondhand vessels. The two strong messages we received from our global consultation process was that we should preserve the general concept of SALEFORM but that a modest update was required." He added: "We are confident that we can make this well-used form even better."

Knut Frode Eriksen, NSA director said. "We are very pleased that this important project is underway in a good co-operation with BIMCO and aim to publish the revised SALEFORM 2011 next year. The strong experience and expertise of the sub-committees involved should ensure a revision that can be embraced by all parts of the industry. I am very encouraged with the dedication and enthusiasm going into this project by the sub-committees."

One of the most important international organisations headquartered in Denmark is BIMCO.

BIMCO has also supported 'The Guide', which is claimed to be the first comprehensive guide to ship efficiency and technology measures. The Guide will be launched in February 2011 and is also supported by Lloyds Register.

It was developed by Fathom, a provider of market intelligence products and services for the marine and energy industries. The Guide features over 60 eco-efficiency technologies and measures, that are currently commercially available, as well as information on the 130 companies behind them. It provides in-depth analysis of the current market for eco-efficiency technologies, a critique of which technologies are the most advanced, whether they can be retrofitted or not, their fuel saving payback and vessel type applicability.

Amid rising crude and bunker prices, The Guide has been developed to meet the increasing thirst for knowledge of fuel saving efficiency technologies and measures, as shipping faces increasing commercial and regulatory pressure to reduce fuel costs and emissions, respectively, Fathom said.

A BIMCO spokesperson commented: "BIMCO welcomes The Fathom Guide to Ship Efficiency Technologies and Measures as a new tool for shipowners, operators and designers who are searching for information on reduction of air emissions from ships. Fuel costs represent in general the largest operating cost for ships. The shipping industry and its suppliers are increasingly innovative in discovering means to reduce fuels costs and emissions and 'The Guide' provides a comprehensive listing of the options available for the shipowners and shipbuilders."

Mandatory reporting

In another move, which will affect the Danish shipping community, at last year's IMO's MSC 88 meeting, a Danish-Swedish proposal for a mandatory ship reporting system in the Sound was adopted. This system is to replace

BIMCO deputy secretary general Soren Larsen.

One of Palmali's sea/river *Armada* class tankers fitted with API Marine cargo control equipment.

the current voluntary reporting system. Now the basis has been created for making the temporary traffic monitoring system in the Sound mandatory, thereby enhancing the navigational safety of the dense vessel traffic in the Sound.

The MSC committee re-elected Neil Ferrer from the Philippines as chairman and deputy general-director and Christian Breinholt of the Danish Maritime Authority as vice-chairman for 2011.

Denmark has had some success recently in marketing its flag to disaffected Swedish shipping companies. However, a leading equipment supplier has gone the other way.

Last December, it was announced that Alfa Laval was to acquire Aalborg Industries for SEK5 bill cash.

Aalborg Industries has some 2,600 employees and was expected to generate sales of about SEK3.3 bill in 2010. The company is a leading provider of products, systems and service solutions, mainly to the marine and offshore markets. Its portfolio includes boiler systems, thermal fluid systems, waste heat recovery systems and inert gas systems.

Alfa Laval said that Aalborg complements and further strengthens its leading global position, by adding a strong product offering that focuses on energy efficiency. As a result, top and bottom line synergies are expected to be derived from this acquisition. It can provide an attractive platform to continue Aalborg's successful development, for instance in applications, such as exhaust gas cleaning, the Swedish company said.

"Aalborg Industries is an excellent fit and I'm very pleased to welcome a strong and well-run company into Alfa Laval", said Lars Renström, Alfa Laval group president and CEO. "Aalborg Industries complements our offering of energy-efficient and environmental solutions. It represents a significant business opportunity as it not only supports the development of our offering to the marine and offshore markets but also means we can introduce their product offering to new industrial end markets and customers."

With the acquisition of Aalborg Industries, Alfa Laval will further strengthen its offer in heat transfer. It will add market-leading positions in attractive market segments, including boilers and thermal fluid systems, as well as inert gas systems, with significant barriers to entry. These include extensive certification processes, a strong innovation track record and a global service network.

The company claimed that its strong manufacturing and engineering presence in fast-growing markets such as China, Vietnam and Brazil, as well as the after sales market potential generated by a large installed base, are highly attractive attributes.

Today, Aalborg Industries is the world's leading manufacturer and supplier of marine boiler systems, as well as a major provider of inert gas systems, thermal fluid systems and shell & tube heat exchangers.

Russian contracts

Another successful Danish equipment supplier is Aalborg-based API Marine.

This company recently announced a contract with JSC Volgograd Shipbuilding Plant in Russia for the delivery of full integrated cargo control, monitoring and alarm system for a series of 10 oil/chemical tankers, ordered by the Istanbul-based Palmali Group.

The new tankers represent the third range of *Armada* type vessels, project RST22M, with an overall capacity of 8,090 cu m. They are designed for mixed river/sea transportation of petroleum products and vegetable oils.

The new vessels will be equipped with advanced API Marine equipment from combined level, pressure and temperature measurement in cargo tanks, using a unique self-calibration multi-functional unit – TGD (Tank Gauging Device), to monitoring and control the ballast tanks, service tanks, fuel and lube oil tanks with an integrated system, based on the company's range of sensors and systems.

API Marine and Palmali have a long history of successful co-operation, established through previous supplies of full cargo monitoring and alarm systems for the earlier *Armada* type tankers built at shipyards in Turkey and Russia.

The new contract further strengthens this co-operation, adding up to the supply of equipment to a total of 40 vessels in Palmali's fleet. "Unique technology for accurate and reliable tank gauging, developed by API Marine, based on guided acoustic principles, in combination with fast and flexible service support, securing overall reliable operation – has again proven to be the key points for the owner's and shipyard's decision", said Sven Egelund Rasmussen, API Marine managing director.

Venezuelan contract

Elsewhere, Erria Consulting, a subsidiary of Danish shipping company Erria, recently won a DKK60 mill deal from Venezuelan state oil company Petroleos de Venezuela (PDVSA).

Under the terms of the contract, the consultancy will act as adviser on the construction of two 27,000 dwt asphalt tankers until 2015. They will be among the largest of their type in the world, the company said.

They will be of 188 m in length, 28 m beam and with a draught of 9.5 m. Their loading capacity will be 24,000 cu m and the cargo will be carried at 200 deg C. The main engine will be MAN B&W types developing 9,960 kW.

Erria Consulting had already secured DKK50 mill deals with the Venezuelans in December 2009 on the back of the parent company's partnership with PDVSA.

This related to the building of four Aframaxes of 113,000 dwt each from 2010 for a period of four years. Erria will provide an inspection team at the newbuilding yard in co-operation with PDVSA's own site manager.

In addition to project co-ordination, the office in Copenhagen will work with drawings approval and technical support. Managing director Henrik Andersen, together with Jørgen Thuesen and Vagn Skaarup, has visited the yard where the ships will be built. It is the first time that the shipyard has tackled a tanker. Previously, the yard was involved in construction of a small multi-purpose container vessel, but she was never completed. TO

Green Ship of the Future expands project portfolio

Almost three years after setting sail towards more environmental friendly and energy-efficient shipping, the Danish maritime industry initiative called 'Green Ship of the Future' is still producing results.

Today, products and results from the initiative are implemented on more than 100 vessels. Although primarily a Danish initiative, 'Green Ship of the Future' will also welcome foreign companies if they are performing a project with a Danish concern, a spokesman said.

Many elements are coming together in the project: research, development, demonstration, innovation, education, training and dissemination of knowledge. Those involved include: systems for recycling heat energy, optimisation of the hull, propellers and rudders, optimisation of the draft and speed for a given route and arrival time and monitoring the fouling of hulls and propellers. Engine technology is an especially essential factor for achieving the planned benefits.

Initially, 'Green Ship of the Future' consisted of four companies, Aalborg Industries, AP Moller-Maersk, MAN Diesel and Odense Steel Shipyard, who joined together with the primary objective of developing and demonstrating green technologies within shipping and shipbuilding. The focus was on developing solutions based on what was technical possible instead of basing the development solely on the demands of shipowners and shipyards.

Soon after, more than 15 partners had joined. This led to a more formalised partnership, and the group of companies decided on performing a so-called 'low emission' study on a 8,000 TEU containership and a 35,000 dwt handysize bulk carrier where the results from the individual projects where accumulated with respect to interdependent interference and compared with an estimate of the extra cost of implementation of the green technologies.

The 'low emission' studies of the two vessel types showed that it was possible to save up to 7.2 % on CO_2, 79.1 % on SOx and 98.6% on NOx regarding the 35,000 dwt bulk carrier and 14 % on CO_2, 90 % on SOx and 80 % on NOx on the 8,000 TEU container vessel without lowering the speed, or changing main parameters of the vessels. So mission accomplished for NOx and Sox, whereas initiatives were still required to meet 30% CO_2, the organisers said.

Another new initiative is expected to be the low-emission study of a ropax ferry. The focus will naturally be on elements within machinery and propulsion, but the plan is also to look at other areas affecting emissions.

General secretary, Christian Schack, said, "In the ferry study, we are initiating new projects concerning HVAC, isolation, windows and lighting, but there might also be projects within looking at how the design of the cargo deck can decrease the loading time in port and thereby help decrease the overall ship speed at sea and still keep schedule with a reduction of emissions as a result."

The IMO's decision to reduce the sulphur level in fuel oil to 0.1% by 2015, or clean the exhaust gas to an equivalent level brings an interesting challenge regarding retrofitting of ships sailing in ECAs.

'Green Ship of the Future' has established a new project where a group of companies will work together on comparing various abatement technologies to fulfil the ECA requirements, ie the use of scrubber technology, the use of LNG as fuel and the use of low sulphur fuel/distillate.

The objective of the project is to set up practical solutions, as well as uncovering the financial aspects regarding installation, operation and maintenance of the three alternatives. Basis for the retrofit project is a newly built 38,500 dwt tanker from NORDEN (see page 24) and the project partners are expected to deliver results during 2011.

Another project involves the reduction of aerodynamic resistance thereby reducing fuel consumption. In the project, the handysize bulk carrier Seahorse 35 from Grontmij/Carl Bro is evaluated with the help of FORCE Technology.

This initiative is endorsed by the Danish Ministry of Economics and more importantly, the SOx abatement study and the two initial studies were jointly financed by the Danish Maritime Fund and the project partners.

Lobbying

Denmark has been heavily involved in lobbying at the IMO on climate change for an international greenhouse gas (GHG) fund together with Cyprus, Denmark, Marshall Islands, Nigeria and the International Parcel Tankers Association (IPTA).

At a GSF conference and workshop held last September, Christian Breinholt, deputy director general of the Danish Maritime Authority outlined the Danish viewpoint.

He said that it was necessary to have a global agreement taking into account the characteristics of international shipping. His rationale behind the proposal took into account a vessel's longevity and the growth in international shipping. The contributions would come from all sectors in offsetting GHG emissions.

Breinholt explained the key elements of the scheme, which included a bunker fuel contribution thus–

1) Mandatory registration of bunker fuel suppliers.
2) Based on the bunker delivery note as evidence.
3) Collection by registered bunker fuel suppliers.
4) Direct transfer to the international GHG fund.
5) All marine fuels for vessels in international trades.

As for the revenues collected, these would be used for –

1) Mitigation and adaptation activities.
2) R&D projects.
3) Technical co-operation with the IMO.
4) Administrative expenses for the fund's operation.

TO

Why EEDI won't work

The IMO may be on the verge of enacting an amendment to MARPOL, which would require new large ships to meet an Energy Efficiency Design Index (EEDI)*.

EEDI is a calm water, trial measurement of the CO2 output of the ship at a *single* power rating (75% mcr) ratioed to a measure of the ship's transport capability. The assumption is that a 25% reduction in EEDI will result in a 25% reduction in fleet CO2 emissions. This claim was central to the IMO's recent report to the Cancun Conference.

And it is just flat wrong.

EEDI is based on a static view of the world. The basic fallacy underlying EEDI is that the ship's steaming speed is fixed. In competitive sectors such as tankers this will happen only if the market spot rate is constant.

In fact, in the bulk trades, the spot rate ranges from rates so low that the owner is barely covering fuel bills to rates so high that the owner can pay off a ship in as little as 10 voyages. Figure 1 shows the VLCC spot rate for the last 20 years. The basic pattern is longish periods of very low rates, during which, at current and projected bunker fuel oil prices, the ships will be steaming as slow as they can, interspersed with spikes in which the ships will steam as fast they can, almost regardless of bunker price.

The ships will almost never be steaming at 75% mcr.

Figure 2 is a histogram of VLCC spot rates over the last 20 years. The average of these spot rates, Worldscale 63, is roughly equal to the rate the VLCC owner would have to average in order to just breakeven on the investment, including the capital cost, the so-called RFR. However, 90% of the time, rates are below RFR, usually well below. Less than 10% of the time, the rate is in full scale boom, several times RFR.

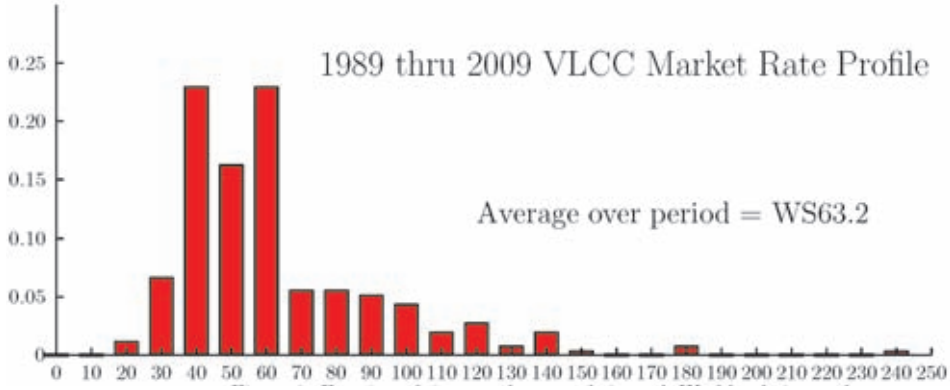

Figure 2: Fraction of time market spends in each Worldscale interval.

In order to properly analyse EEDI, or a carbon dumping fee, or mandatory max speed or any other regulation which affects steaming speed, we must do so over a market cycle adjusting the ship's speed to the current spot rate. CTX has undertaken such a study using VLCC's as an example.

The study compared an EEDI-compliant and a non-EEDI compliant (no regulation) VLCC for two fuel oil prices -

1. $465 (about current).
2. $620 (current plus $50/t CO2 dumping fee)[1]

Added on are three EEDI levels: Phase I (-10% from baseline), Phase II (-25%), Phase III (-35%).

Both ships incorporated feasible, prudent, efficiency measures which currently have negative abatement cost. Table 1 shows typical results.

In Table 1, the second and third columns

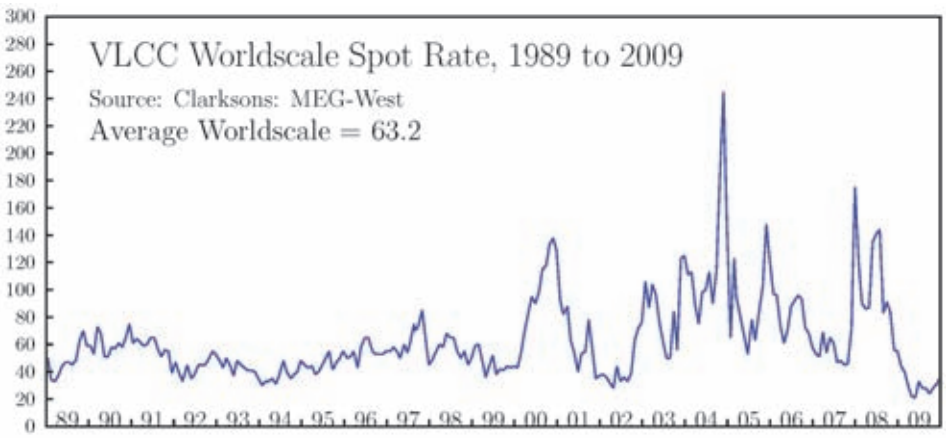

Figure 1: VLCC Spot Rate for the last 21 Years.

Footnotes:

[1] A ship emits a little over three tonnes of CO2 per tonne of fuel burned. A $50/t CO2 fee imposed as a bunkers tax would increase the owner's fuel cost roughly $150/t BFO.

[2] Gratsos, G., Psaraftis, H. and Zachariadis, P., Life Cycle CO2 Emissions of Bulk Carriers: A Comparative Study, Int. Journal of Maritime Engineering, Jul-Sep 2010, pp A 119-A 134.

[3] In economic jargon, the marginal societal value of a ton-knot of transport capacity is far higher in a boom than in a slump. A fee responds to this order of magnitude change in value efficiently. EEDI and other mandated restrictions do not.

WS	Ave spd Non-EEDI	Ave spd EEDI	Ratio CO2	% Diff.
30	10.25	10.25	1.0000	-0.0
40	10.74	10.74	1.0000	-0.0
50	11.19	11.19	1.0000	-0.0
60	11.97	11.97	1.0000	-0.0
70	13.20	13.20	1.0000	-0.0
80	14.24	14.00	0.9820	-1.8
90	15.00	14.75	0.9846	-1.5
100	15.49	15.25	0.9948	-0.5
110	15.99	15.49	0.9732	-2.7
120	16.25	15.94	0.9903	-1.0
130	16.49	15.94	0.9747	-2.5
140	16.72	16.17	0.9762	-2.4
150	16.83	16.17	0.9632	-3.7
160	16.83	16.17	0.9632	-3.7
170	16.83	16.17	0.9632	-3.7
180	16.83	16.17	0.9632	-3.7
190	16.83	16.17	0.9632	-3.7
200	16.97	16.17	0.9427	-5.7
Average	1.238	1.226		-1.0.

Table 1. Phase 1 Percent reduction in CO2, BASE (noEEDI) vs 6 cyl ship (EEDI). BFO=$465.

BFO COST	Phase 1	Phase 2	Phase 3
$465	-1.0%	+2.0%	+1.7%
$620	-0.8%	+1.6%	+1.7%

Table 2. Overall Summary of results Pct reduction in CO2 Emissions averaged over market cycle. Negative implies EEDI compliant fleet better.

	Phase 1	Phase 2	Phase 3
Fleet Size	+4%	+18%	+29%
B/R/SCO2	+0.1%	+0.6%	+1.0%

Table 4. Increase in fleet size for same transport capacity.

were computed by finding the loaded/ballast speed that maximises the owner's $/day earnings for the given spot rate, fuel cost, and speed/fuel curve. (The optimisation was done in half knot increments, so it can be a little jumpy.) The fourth column was generated by computing how much CO2 each ship would produce per tonne per day delivered on the standard route (Ras Tanura-Yokohama), and then ratioing these two numbers. In other words, the fleet sizes have been adjusted to deliver the same amount of transport capacity.

The bottom line shows the CO2 produced per tonne of cargo delivered per day for each ship averaged over the market cycle using Figure 2.

In this case, the Phase I EEDI compliant fleet produces 1% less CO2 over the market cycle. Table 2 summarises the results.

The Phase 2 and Phase 3 EEDI fleet produce more CO2 than the non-regulated fleet. How can this be? The answer is two fold:

1) EEDI effectively limits installed power. But at current and expected BFO prices, a non-EEDI VLCC owner uses all his installed power only in a full boom. So for the great bulk of her life, a non-EEDI ship uses little or no more power than an EEDI-compliant ship.
2) In limiting installed power, EEDI induces owners to use smaller bore, higher rev/min engines.

Table 3 shows CTX's estimate of how VLCC owners will respond to EEDI. These engines have higher specific fuel consumption and more importantly require a smaller, less efficient propeller. This means the EEDI compliant VLCC consumes more fuel when the market is not in boom, which is 90% of the time.

Even if we unrealistically assume away problem (2), our numbers indicate that the Phase 2 (25% reduction in EEDI) EEDI-compliant VLCC fleet will produce about 2% less at-sea CO2 than the non- EEDI fleet. And this is only at-sea emissions.

Table 4 shows the VLCC fleet size requirements of EEDI.

The increase in build/repair/scrap emissions is based on Gratsos et al converted to equivalent at sea emissions[2]. Gratsos considered only emissions at building, repair and breaking yards. Mining, flying crews around, additional cargo loss due to tank breathing, etc were not included.

Finally, these are all calm water numbers. The low-powered EEDI compliant ship will have considerably poorer performance in heavy weather than the non-EEDI ship. As Table 3 shows, in order to meet Phase 3 EEDI, VLCC's will have to go down to about 13,000 KW mcr. This is less than half the present practice. This ship will not only have great difficulty maintaining any speed in bad weather, but also her engine will be pushed much harder over the market cycle than the non-EEDI ship's. And that means a big jump in machinery failures.

As far as I know, similar studies have not been done for smaller tankers; but there is every reason to believe that such studies

	No EEDI	Phase 1	Phase 2	Phase 3
gCO2/dwt-kt@75%MCR	2.54	2.09	1.74	1.51
MCR(kW)	27,500	23,600	16,500*	13,200**
Number cylinders	7	6	6	6
BORE(mm)	840	840	650	600
RPM(MCR)	75	75	95	105
SFC@MCR(book)	168	168	171	171
PROPDIAM.(m)	9.9	9.9	7.1	6.0
Propulsive efficiency	0.73	0.73	0.67	0.64

- *De-rated from 17,200kW. **De-rated from 14,400 kW.
- Disallowed less than 6 cylinders on vibration grounds. Reduction gear not considered.
- Lower powered ships spend much more of the market cycle at or close to MCR and above the min SFC point.
- Heavy weather, manoeuvring characteristics of ships on right need to be carefully studied.

Table 3. Main propulsion parameters of EEDI compliant VLCC's.

WS	Ave spd 465	Ave spd 620	Ratio CO2	% Diff.
30	10.25	9.98	0.9854	-1.5
40	10.74	9.98	0.9472	-5.3
50	11.19	10.50	0.9307	-6.9
60	11.97	10.74	0.9197	-8.0
70	13.20	11.74	0.8965	-10.4
80	14.24	12.24	0.8865	-11.3
90	15.00	13.24	0.9094	-9.1
100	15.49	14.00	0.9224	-7.8
110	15.99	14.50	0.9141	-8.6
120	16.25	15.25	0.9301	-7.0
130	16.49	15.49	0.9262	-7.4
140	16.72	15.75	0.9290	-7.1
150	16.83	15.99	0.9297	-7.0
160	16.83	16.49	0.9678	-3.2
170	16.83	16.49	0.9678	-3.2
180	16.83	16.72	0.9867	0.0
190	16.83	16.72	0.9867	0.0
200	16.97	16.83	0.9787	-2.1
...	...	...	....	-2.1
260	16.97	16.83	0.9787	-2.1
270	16.97	16.97	1.0000	-0.0
Average	1.238	1.161		-6.2

Table 5. Percent reduction CO2, $50/ton CO2 for non-EEDI ship at $465 versus $620 BFO cost.

would generate very similar results.

EEDI is a loser. So what should we do? The answer will be obvious to any first year economics student: charge the polluter for his pollution.

Table 5 shows how VLCC owners would respond to a $50 per tonne CO2 dumping fee which would increase the owner's fuel oil cost about $150/t.

Over the market cycle, this carbon dumping fee would generate a 6.2% reduction in CO2, far more than any level of EEDI. But it is how the fee works that is interesting.

Comparing Tables 1 and 5, below about WS150 — in other words, almost all the time- the non-EEDI ship with the fee is steaming more slowly than the Phase I EEDI compliant ship without the fee. It is only in an all-out, full boom that the non-EEDI ship with the fee steams faster than the Phase I EEDI ship without the fee. But this is exactly what we want, for it avoids wastefully expending resources on additional ships, just to handle a boom[3].

A carbon dumping fee is effective, efficient, and safe. EEDI is none of the above. TO

**This article was written by Jack Devanney, Center for Tankship Excellence, USA, djw1@c4tx.org*

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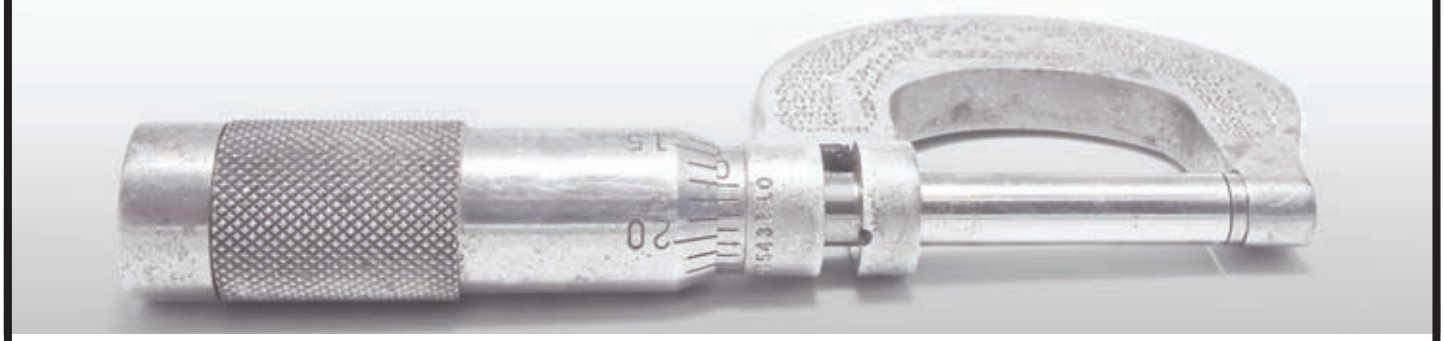

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MLC top of Barbados flag agenda

The Barbados Maritime Ships' Registry (BMSR) technical committee's prime concern today is the implementation of Maritime Labour Convention 2006, principal registrar Christopher Sawyer said.

"Our process of implementation will allow opportunity for the ship operators, the crews and the flag state inspectors to become accustomed with the required scope," he explained.

Other issues concerning the recently re-convened Barbados Ship Owners and Managers Association (BSOMA) is the continually deteriorating security situation affecting vessels trading lawfully and the apparent inability of governments to mount adequate protection to vessels.

"Barbados supports the work of the IMO in bringing shipping to the point of it making the industry's contributions to the international effort," Sawyer said.

Turning to the IMO's voluntary member state audit scheme (VIMSAS), he said that Barbados was in the process of applying for the IMO audit.

However, he warned that BSOMA members were concerned that recent evaluations being made by PSC under the new inspection regime recently announced by the Paris MoU (see page 19) are likely to give a higher inspection priority to a vessel whose flag has low detention rates, but which is not IMO audited, compared with a flag, which has a higher detention rate whose flag had undertaken the IMO audit.

"We are pleased with our PSC record which maintains us solidly in the Paris MOU 'White List' - an area in which most of the Barbados flag vessels are trading.

"Our position 30th from the top of the table reflects well compared with flags (listed) near us in the table as our average of our fleet was over 20 years (of age) last year," he said.

Several years ago, the registry introduced a Safety Watch programme to assist its operators keep on top of the detainable items on vessels of 10 years and older in the fleet. "This, together with our Ship Condition Mapping allows the administration to be alerted in advance that standards are beginning to fall away," Sawyer said.

Speaking of the possibility of facing sub-standard vessels applying for registration, Sawyer claimed that the registry has not had to de-register a ship for four years. "We are continually having to turn vessels away whose owners wish to register with Barbados, due to either the vessel being too old, or that the vessel, or the manager has a poor PSC detention record. With a manager not known by BMSR, we review all of its vessel's PSC history," he said.

Barbados maintains two forums through which shipowners and managers may participate in the management of the registry.

BMSR's Christopher Sawyer.

Membership of the Ship Owners Association (BSOMA) is by invitation and is made up of senior representatives of companies having at least three vessels in the BMSR for a minimum period of three years.

The purpose of the association is to give the clients a voice in the decision making process of running an international ship register.

As well as through the AGM, members are encouraged to voice their opinion regarding the operation of the Registry throughout the year and can make depositions regarding the ratification by Barbados of new international regulations and the application and interpretation of existing regulations.

In addition, companies having representation in BSOMA may elect to have a person of their choice represent their company on the registry's technical committee.

The function of this committee is to provide a technical resource to enable the operator's perspective to influence the decisions made by the registry.

Such decisions may include the assessing of PSC detention reports to assess the viability of launching an appeal against the detention, or the interpretation of current legislation effecting operational matters.

Members of the technical committee are either contacted individually to give their views, or may be brought together for collective discussions when this is warranted by the issues under consideration, BMSR said. TO

Port state Control gets tough on tankers

The Paris MoU Port state Control (PSC) organisation has warned that significant number of tankers could still pose a risk to the environment.

According to the Paris MoU, in recent years some concern had been expressed by several members that in some cases tankers were not being loaded in compliance with IMO damage stability requirements. This means that in the case of a collision or grounding, the ship may not survive, resulting in possible pollution or even loss of life.

As a result, the Paris MoU committee decided to undertake a Concentrated Inspection Campaign (CIC) on tanker damage stability in the region from the 1st September 2010 to 30th November 2010 to assess the situation regarding damage stability.

Preliminary results from the CIC on tanker damage stability showed that a total of 173 tankers - 16.2% of those inspected - could not demonstrate that they were normally loaded in accordance with the Stability Information Booklet (SIB).

Broken down into vessel types, out of the 173 vessels, there were 77 oil tankers, 84 chemical tankers and 12 gas carriers.

The CIC questionnaire was completed on a total of 1,065 tankers (419 oil, 538 chemical and 108 gas tankers). A total of 94 (8.8%) inspections found deficiencies directly related to the CIC.

PSC inspectors detained four tankers, as a direct result of the CIC for not complying with damage stability requirements - two oil tankers and two chemical tankers.

Richard Schiferli, Paris MoU general secretary said that although just four detentions might seem a small number given the large number of ships with deficiencies, it had been agreed that during the CIC, detention was a last resort.

"Only for cases where the ship was loaded for the forthcoming voyage and could not show damage stability compliance prior to

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departure, a detention order was issued," he said. "Therefore tanker damage stability should remain an area of attention in the future."

Pat Dolby, CIC co-ordinator said: "The most significant finding from the campaign was that 16.2% of tankers that were inspected, the master could not demonstrate that the ship was normally loaded in accordance the SIB. This is a significant number of tankers that, during a 'spot check'. could not show compliance with stability requirements and thus may pose a risk to the environment."

The detailed results will be submitted for review to the 44th meeting of the PSC committee in May 2011, after which the report will be submitted to the IMO.

On 1st January this year, the Paris MoU introduced a new inspection regime (NIR). Under the new NIR, vessels are now ranked;

- Low risk.
- Standard risk
- High risk.

Low risk ships will be awarded with longer inspection intervals by PSC of up to 36 months, compared to six months in the current system. In order to qualify for a 'low risk ship' category, several criteria need to be met. With regard to flag the following will be decisive:

- Flag appears in the 'White List' published in the annual report of the Paris MoU.
- Flag has informed the Paris MoU secretariat that a final audit report including, where relevant, a corrective action plan has been drawn up in accordance with the 'Framework and Procedures for the Voluntary IMO Member State Audit Scheme. (VIMSAS). TO

Flag state performance table updated

Late last year, the Round Table of international shipping associations (BIMCO, International Chamber of Shipping/International Shipping Federation, INTERCARGO and INTERTANKO) published their latest 'Shipping Industry Flag State Performance Table'.

The Table, which is updated annually, can be downloaded at www.marisec.org/flag-performance.htm

It accompanies the '*Shipping Industry Guidelines on Flag State Performance*', which summarises factual information derived from the public domain. The intention is to provide a general understanding of a flag's performance and to encourage ship operators to reflect on a flag's quality before using it, the group said.

The results of the 2010 study demonstrate that the vast majority of the world fleet is registered with flag states which take their responsibilities very seriously.

Many flags have ratified most of the key IMO conventions, adequate enforcement of which is shown by their Port State Control records. Many flags have improved their performance in previous years, some dramatically, and notably six flags had no potential negative performance indicators at all in 2010.

> "Since the Table was first compiled in 2003, there has been a noticeable decline in the number of flag states that appear on the black lists of regional PSC authorities."

Since the Table was first compiled in 2003, there has been a noticeable decline in the number of flag states that appear on the black lists of regional PSC authorities.

There were still a number of poorly performing flags and for 2010, the list of flags which the Round Table believed shipowners should think very carefully about before using. These included - Albania, Bolivia, Cambodia, Colombia, Costa Rica, Cote d'Ivoire, Democratic Republic of Congo, Georgia, Honduras, Lebanon, St Kitts and Nevis, Sao Tome and Principe and Sierra Leone.

The table and accompanying guidelines are intended to complement the Voluntary IMO Member State Audit Scheme (VIMSAS), by which maritime administrations are subject to external audit under the auspices of IMO with regard to their implementation of IMO conventions relevant to the safety of life at sea and protection of the marine environment. The shipping industry associations said that they welcomed the decision taken by the IMO Council to make this scheme mandatory in future. TO

Shipping documentation - the next step

For tanker owners and operators, 2011 will be the year in which electronic shipping documents (eDocs) gain critical mass against the paper bill of lading, driven by regulatory pressure and the need for commercial efficiency, says Alex Goulandris*.

Paper is dead. Long live eDocs. The electronic bill of lading (eB/L) is a reality, fully available to charterers, owners and operators, terminals and agents. And 2011 will be the year when eB/Ls become firmly embedded in the fabric of the energy shipping markets of Europe and the Americas.

It's not before time, either. Bills of lading are a shipping legacy dating back 6,000 years and are familiar to everyone in the industry from the super majors and commodity trading houses to small family shipowners. But no-one who deals with them on a daily basis has anything positive to say about the current paper process.

Such an archaic process struggles in the modern world, when everything else from money transfers and charterparty recaps is already digital. Using paper actually generates significant costs due to the need for parties to congregate around draft originals for signing; delays caused by physical transfer; need to retrieve paper originals prior to amending bills of lading; risk of fraud; etc.

With documents typically created in multiple non-integrated systems by various parties, from a terminal's documentation team, terminal's laboratory, ships agents and independent surveyors, up to 90% of information is re-typed between systems, causing delays, duplication and a high likelihood of errors and variances. In addition, documentation can be created hours away from the vessel's berth, causing yet further logistical issues and delays.

Using eDocs instead of paper documents offers a number of immediate advantages. Some are purely administrative but most have the potential to improve the bottom line for carriers, trading entities and other parties such as agents and independent inspectors.

eB/L offer faster vessel turnaround thanks to improved document processing, minimising time spent at the load port dealing with documentation or any delays at discharge port while awaiting documentation. They offer reduced outstanding freight payments where freight is settled on receipt of documentation by the shipper/charterer. eDocs also offer the ability to discharge cargo against an original eB/L rather than a letter of indemnity (LOI), thereby enabling the carrier to remain within its P&I cover.

ESS was established in 2003 to realise these benefits and enable international trading partners to use eB/Ls and supporting documentation, safety data sheets and other trade documents for operational, trading, customs and compliance purposes.

That vision of an eB/L was realised in January last year when the first CargoDocs electronic documents were transacted between BP Oil UK, Morgan Stanley, Ineos, Denholm Barwil and Broström Tankers at Ineos' Finnart terminal.

Broström Tankers' operations director Andreas Jorgensen said; "for a long time we wanted to move on and catch up with technology. We want to be in the forefront of using technology efficiently but still in a safe way. CargoDocs eases the administrative burden for the captain and fosters real time savings."

As 2010 ended, ESS entered the Baltic oil export market with a trial of CargoDocs by Russian forwarder Balt-Forward for Russian Export Blend Crude Oil (Rebco) crude and products shipments ex-Primorsk set for the first quarter of this year. Together, Primorsk's crude and products terminals are the largest

Ineos' Finnart terminal benefited from using eDocs.

ESS' Alex Goulandris.

hubs for Russian oil exports with combined throughput in excess of 79 mill tonnes from 935 tanker calls per annum.

Lolita Savchenko, operations director of Balt-Forward in the Port of Primorsk said owners and masters should see immediate time savings. Ms Savchenko estimates that using eB/Ls "will eliminate up to six hours per voyage, which are currently wasted on printing, signing, stamping and distributing paper originals. As you can imagine, we are very enthusiastic about CargoDocs."

Prior to the operational launch of CargoDocs, ESS undertook two and a half years of testing with a group of international trade partners. This extended testing phase allowed the shipping and energy industries to work with ESS through its users association, the ESS-Databridge Development Group (DDG) to ensure that CargoDocs was built around best industry practices and could be adopted with no operational risk.

Reducing those risks involved a number of steps including developing eDocs best practices with the industry, building standard workflow processes into CargoDocs and developing functionality, which enables carriers to use eDocs through a secure email client if always-on internet was not available on a vessel. ESS also obtained approval from the carriers' P&I Clubs to protect users from perceived exposure associated with potential IT risks. ESS published annual IT audits to DDG members and developed ISO27001-equivalent data centre security certification.

In addition, ESS worked with customs authorities to produce eDocs output that were acceptable to government agencies and undertook thousands of simulated transactions working with as many as 20 parties on single trades.

Finnart's use of CargoDocs was the start in a wave of adoption. Ineos, for example, issued a 'Notice of Transition', placing shippers on notice that it was transitioning from paper to eDocs at both Finnart Terminal and Grangemouth Refinery. Trading companies already live include BP, Shell, ConocoPhillips, Morgan Stanley, Mabanaft and Ineos. Shipowners include Broström Shipping, Hellespont Tankers, Teekay Tankers while a significant number, including Maersk Tankers, AET, BP Shipping, Tarntank, Donsotank and Uni-tankers are ready to use eB/Ls. Testing is ongoing at ConocoPhillips' Teesside Terminal, Hamble Terminal (BP) and Baton Rouge (ExxonMobil).

So what will drive wider adoption of eDocs in 2011? Ultimately it's a choice between wasting time and money on an inefficient process, or catching up with current business processes. There is also a steady legislative march in favour of the use of electronic documentation in shipping.

From 1st January 2011, all traders must use EMCS for all movements of duty-suspended excise goods within the EU. EMCS is a computerised system which will capture and process information in respect of all movements of excise goods in duty suspension (including oil products) within the European Union. It will replace the current paper-based Administrative Accompanying Document (AAD) for intra-EU duty suspended movements, capturing and processing AAD information online, validating data and allow real-time notification of dispatch and receipt of goods. As a result, EMCS will link over 150,000 traders in 27 national administrations across the EU.

Rotterdam rules

In 2008, the Rotterdam Rules were opened for signature and to date, 23 states have signed them. The Rotterdam Rules give functional equivalence to eB/Ls to sit alongside legislative recognition of eB/Ls in the US. In 2003, acknowledging the importance of e-commerce in shipping, Article 7 of the Uniform Commercial Code was revised, introducing new rules for electronic documents of title.

Following its historic first eB/L transaction, the Finnart terminal and Broström's *Bro Deliverer* made history again soon afterwards when original eB/Ls were issued, transferred through the trade chain to the receiver, which produced them back to the vessel while it was still moored at the loadport - a process which took just 13 minutes.

Even on short-sea shipments like this, the original paperwork would normally remain on the vessel, forcing all parties in the trade chain to rely entirely on Letters of Indemnity. But rather than follow his normal practice of sifting through a stack of paperwork, the vessel's master - Ove Horgerud - checked the contents of the eB/Ls and supporting documents prepared by the terminal online. Satisfied that they were accurate, he instantly signed the documents for multiple parcels of refined products electronically and with just a single click.

The terminal, having itself electronically signed all the required certificates of quality and quantity electronically issued the full set of eDocs to the shipper, Morgan Stanley. Once it was satisfied that the eDocs were accurate, the company transferred them to cargo receiver BP Oil UK, rather than issue a trading LOI. BP, having checked the contents of the eDocs online, produced the eB/L back to the vessel, requiring delivery at the discharge port - Belfast.

The carrier, satisfied that it was delivering against an original eB/L, did not require a discharge LOI prior to delivering the cargo. There was no faxing or printing, no courier charges and no risk of loss of documents or copies. Each participant also has an archive of all the documents associated with their voyage, easily accessible in their electronic files for a minimum of 12 years.

As an argument for abandoning paper bills of lading and moving to eDocs, it was a very profitable use of 13 minutes. TO

Alexander Goulandris co-founded Electronic Shipping Solutions (www.essdocs.com) while studying for an MBA at Wharton School of Business. He has been the company's CEO since it was established in 2003.

It was set up to address the perceived inefficiencies of paper documents in shipping and to enable trading partners to use electronic documents, including bills of lading, safety data sheets and customs documentation for operations and compliance purposes.

ESS eDocs is currently in use at some of the world's largest energy traders and shipowners, whose input and governance helps drive ESS's solutions.

Prior to ESS, Goulandris worked as a maritime litigator for six years with Freehill, Hogan & Mahar LLP in the US and Holman Fenwick Willan LLP in the UK, Greece and Hong Kong.

Pirate 'Mother' ships – the pros and cons

With more hijackings taking place in the Indian Ocean and Gulf of Aden regions almost daily, Danish concern RiskIntelligence has examined the use of hijacked vessels as 'mother' ships. These are now being used to launch attacks further away from the coasts.

Somali pirates have used a variety of captured vessels for various purposes in the past years. The uses of such vessels have ranged from floating service stations, to temporary mother ships, or as ferries for reinforcements to ongoing operations (eg *Hansa Stavanger* in April 2009). Initially, the operational use of mother ships in areas of operations was confined to captured dhows or relatively inconspicuous fishing vessels, or smaller craft, such as the tug *Yenegoa Ocean* in 2008. Most of these mother ship uses were limited in scope.

Since the first sortie of the hijacked general cargo ship *Izumi*, however, the parameters for mother ship use by pirates appear to have changed. The ship departed from its Somali anchorage in early November 2010, attacked the product tanker *Torm Kansas* first by deploying her attack skiffs and subsequently by closing distance to rifle shot range and opening fire directly on the tanker. A day later the *Izumi* was used to attack an escorted World Food Programme vessel.

In short order, a number of captured merchant vessels were pressed into pirate service on this model beginning with the *Polar*, the *Hannibal II*, the *Motivator*, and the *York*. Some vessels like *Polar* and *Izumi* have now completed multiple patrols since their hijacking. The *Polar* and the *Motivator* have so far been successful in assisting in hijackings. The pirates embarked on the *Polar* hijacked the *Albedo* on 26th November 2010 and the *Shuih Fu No. 1* on 25th December 2010. The pirates operating from the *Motivator* successfully captured the *Ems River* on 27th December 2010.

The use of ocean-going merchant vessel introduces some significant changes to the Somali pirate modus operandi.

- **Reduced dependency on seasons, currents and weather conditions.** The use of ocean-going vessels allows the pirates to transit Monsoon-affected sea zones irrespective of weather and currents. Pirate activity from captured merchantmen will become an all-year feature.
- **Increased range**. Especially during Monsoon season, pirates can now venture out to calmer sea zones, including the waters around Madagascar and the Equatorial waters of the Indian Ocean towards the Laccadive Sea and the One and a Half Degree Channel.
- **Higher transit speeds.** In spite of deteriorating performance of captured merchantmen, pirate action groups can now be expected to advance at a rate of 10 knots (240 nm per day).
- **Mother ships used for direct attack.** If the target is sufficiently slow, pirates have and will manoeuvre to attack with the mother ship, exploiting their numbers on the vessel and consequently their massed firepower.
- **Threat of reprisal against captured crew.** The pirates have and will threaten reprisals against the captured crews of the mother vessels. This circumscribes the ability of navies to interfere in attacks.

As a result, there are many new challenges facing the task forces. These include -

- **More work for over extended navies.** Navies will be forced to divide their attention between keeping tabs on the large mother vessels and maintaining surveillance of sea zones as a whole and disrupting pirate operations.
- **More volume of fire, better aimed fire.** When utilising a captured merchant vessel in an attack, pirates eliminate the small boat disadvantage. They can pour fire into the target vessel from bridge level, reducing survivability of the bridge team. Also, if faced with armed opposition, pirates now enjoy the same stable firing platform and amount of natural cover like the defenders. On balance, however, pirate action groups will be larger than embarked security teams. Pirates on the captured ship will be able to provide effective suppression of an armed team while the boarding team comes alongside the target vessel.
- **Heavier weaponry.** Hijacked vessels are customarily equipped with machine guns up to and including 12.7 and 14.5mm calibres for self-defence against other pirate groups. It is reasonable to assume that the weapons will remain on board during the patrols and that they will be used in self-defence, or against armed resistance. This variant would be lethal for small escort vessels, who would now suffer from being poor and vulnerable gun platforms.
- **Extended endurance and capabilities of attack teams.** Backed by plentiful supplies of ammunition and fuel on board the captured vessels, attack teams can be expected to operate more aggressively and to pursue more tenaciously. Attack teams that have boarded a target vessel and are up against a citadel situation can draw on tools and reinforcements to break down citadel defences.
- **Collision hazard to slow moving or static assets.** Especially offshore operations will face the added risk of the mother ship interfering with operations including entering exclusion zones, running over equipment and anchor lines etc.

RiskIntelligence also said that there would also be new opportunities -

- **Higher predictability of pirate action groups.** The captured ships at sea will be closely monitored by the navies and their positions will be made public. This allows other vessels to avoid known areas of operations of these merchant vessel-borne groups. Plotting courses and past patrols of hijacked mother vessels will also allow ship operators to establish patterns.
- **Better visibility of pirate action groups.** The merchant vessel-based pirate action groups will be impossible to miss for alert and well-briefed crews. By generally avoiding CPAs of less than 10 nm or more (or remaining out of visual range), vessel can pre-empt attack situations at much longer range than with the boat-based pirate attack groups, which only come into visual range at 4-5 nm.
- **Better identification of pirate action groups**. It is generally known, which mother ships are at sea at any given time. With mug shots of the vessels, unambiguous identification by any look-out will be possible, should the hijacked mother vessel be encountered at visual range.

TO

NORDEN sets the scene

News of the recent purchase of the products tanker *Payal* is an example of NORDEN's commitment to the chemical/products tanker sector.

Including *Payal*, NORDEN acquired six modern secondhand MR and Handysize product tankers last year (three MR and three Handies). This brought the owned tanker fleet up to 15 vessels, which is a record-high. Furthermore, the company has another 20 tankers on long-term charters. All the vessels are traded in the 50% owned Norient Product Pool (NPP) - a commercial joint venture with Interorient - which currently operates 72 vessels.

Payal was built in 2007 at Hyundai Mipo. She is of 37,159 dwt with a capacity of 41,132 cu m. NORDEN said that it expected to take delivery of the vessel in January of this year and as she is ice strengthened (class 1A), she will most likely be employed in the Baltic Sea, the company said.

A few months ago, the tanker department said that it was still prepared to go shopping to prepare for the future and at the time had more tankers than ever. This is still the case, illustrated by the purchase of the *Payal*. All of NORDEN's tankers are commercially operated in NPP with partner Interorient.

Speaking in the Autumn house magazine, NORDEN's head of the tanker department, Lars Bagge Christensen said; "The tanker market is a cyclical market and we cannot level out the large fluctuations, but we can make use of them to our advantage. In the short term our strategy is to keep our costs as low as possible. As part of a more long term growth strategy, we also concentrate on chasing further tonnage at the right prices in expectation that the market will turn and that freight rates and vessel prices will increase."

One example of trying to keep a low cost level was the extension of the charters of four of the seven tankers fixed to Geden Lines. They were renegotiated to about half of their original rates. At the same time, the tanker department made some sound investments, as five vessels were acquired earlier last year, which have increased in value by about $30-$35 mill – around 25% of their purchase price.

"There is a lot of talk about how difficult it is to make money on tanker shipping at the moment, but the charterers at our commercial manager in the 50%-owned NPP pool know their craft. They have proven that it is possible to make money in the current market by focusing on short contracts and they have generally been successful in employing vessels at rates above the average," Christensen explained.

Thanks also to a reasonable level of long term coverage, NORDEN's MR and Handysize vessels consistently earned rate levels above the 12-month level in the first half of last year. In the second quarter of 2010, the department made a small operating profit in a poor market.

"Tankers and drycargo are NORDEN's swings and roundabouts – or a way to spread risk. So far, the tendency has been that when one market is high, the other is low. Right now (mid-2010) the market is low and NORDEN's growth is driven by drycargo. But over the last 10 years, the tanker department has contributed with a total of around $500 mill to NORDEN's bottom line," he said.

Optimistic

As for the future, NORDEN was optimistic that there would be an increased demand for refined products from East to West. "Growth in oil consumption has shifted 100% to Asia, whereas oil consumption in the west hardly moves. On the other hand, the trend is moving towards stricter requirements for a reduced content of environmentally damaging substances. These requirements are best met by the new more efficient refineries in the East and therefore, Europe and the US will increasingly import high specification oil products from the East, whereas Western refineries will presumably export their products to other regions with lower requirements," Christensen said speaking last year.

A result of the stricter environmental requirements is correspondingly stricter oil company requirements for shipowners and operators. Factors such as size, technical conditions, quality, safety, maintenance and education will become even more important competitive parameters, NORDEN thought.

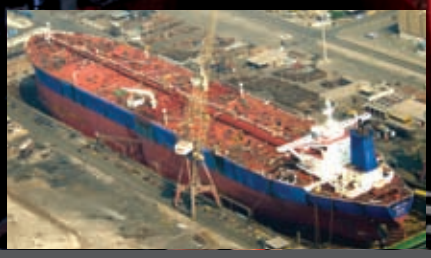
"I think we will see an elimination race where the winners are shipping companies with a certain critical mass and high standards. The oil companies place increasingly high demands on shipping companies and the vessels which they choose to transport their products and the oil companies will primarily choose to contract with shipping companies of a certain size because the technical co-operation and the requirement for competent crew are so comprehensive. Besides focusing on building up a fleet of a certain size, NORDEN's technical department is continuously working on improving vetting efforts in order to meet the strict requirements from the oil companies," Christensen said.

He explained that last Spring, Shell carried out an audit on NORDEN's vessels and procedures and its pool partner Interorient and subsequently entered into a two-year contracts taking five NPP vessels. These contracts were, among other things, the result of the improved vetting efforts. They were the first long term contracts signed between the pool and Shell, as previously, the two parties only worked together on the spot market.

Although rates continued to be weak through the third quarter and for most of last year, the tanker department's earnings were 18% and 25% higher than market rates in MRs and Handysizes during 3Q10, due to good coverage, voyage optimisation and fuel savings, the company said. Taking the 3Q10 as an example, MRs earned an average of $15,200 per day, while Handysizes earned $14,325 per day, which was claimed to be 13% and 19% higher than the 12-month charter market respectively at that time.

NORDEN said that rates would continue to be under pressure in the short term, due to the many newbuilding deliveries entering the product tanker market. However, the company said that in the long term rates were forecast to improve, hence the present market was described as an "interesting investment window".

Last year, the tanker department and NPP started to charter tonnage for short periods following in the footsteps of the drycargo department. In connection with the expansion of NPP's business model, vessels were



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chartered for three to 12 months, some with optional extension periods and were employed in the spot market. At the end of 3Q10, NORDEN had covered 1,718 and 3,572 ship days for 4Q10 and through 2011, respectively, corresponding to 47% and 29%. For this year, daily earnings were $14,490, whereas the average operational costs were $11,818.

Late last year, NORDEN said that it had renegotiated the charters of all seven Handysize product tankers in two tranches following the cessation of an earlier agreement with Geden Lines. The vessels were fixed for another 12 months at rates described as between 40% and 45% lower than the previous levels. The original contracts reflected a stronger three-year charter market of around $19,000-$21,000 per day, whereas the new 12-month contracts were estimated at $11,000-$12,000 per day, reflecting the market's decline.

NORDEN said that it had concluded the first Geden contracts for seven product carriers in 2006 and 2007 respectively with deliveries undertaken a year later. "In co-operation with Geden, we have found a solution where they get the opportunity to extend their charters to us in a challenging market and the vessels are made available to us at reasonable rates," said NORDEN tanker department's senior chartering manager Andrew McPhail.

The seven vessels are all of the Hyundai Mipo 37,000 dwt- 38,000 dwt types. They primarily trade in Europe and are operated in the NPP. Today this pool comprises of 72 tankers taken from partners NORDEN and Interorient's fleets, of which 43 are Handysize, 26 are MRs and three are LR1 types. In addition, NPP will be boosted by a further four MRs currently on order for delivery in the next couple of years, the company said.

MOEPS introduced

In 2008, MOEPS (master's operations environmental performance system) was introduced on board NPP's vessels.

MOEPS was originally developed to provide operators with a joint, automated platform for structuring the many processes in operating the pool's vessels.

It has since developed into a comprehensive communications tool, where most of the information is integrated for the benefit of employees, both ashore and afloat. For example, the operator can follow an individual vessel's voyage and communicate with the master about the optimum speed to gain the optimum fuel consumption to meet the estimated time of arrival.

The master will receive updated information on weather and current conditions directly on a screen in order to plan the best possible route. Port agents are hired and reimbursed through the system and all the standard operating procedures (SOPS) are entered into MOEPS, carefully described and updated as necessary, the company said.

An example of the system's success was that during the second quarter of last year, NPP claimed to have saved $3.6 mill, emitted 25,000 tonnes less of CO2, compared with 2Q09, the company said. In addition, the company expects to reduce the time taken on internal follow-ups by 94 working days per annum. In 3Q10, the savings on fuel were came to $3.8 mill and the reduction of CO2-emissions were 28,000 tonnes, compared to 3Q09.

NORDEN's 2010-built 47,000 dwt MR *Nord Imagination* operates in the NPP.

In the third quarter of last year, the company said that the $615,000 invested in the system had paid off several times. In addition to streamlining the working procedures, MOEPS is a steadily growing database, which provides information across the business. Business awareness has been improved plus the ability to identify potential optimisations, according to Ulla Nielsen, NPP performance manager and MOEPS project manager, writing in the house magazine.

Prioritising agency and tug operator lists was on the agenda to make their selection easier and more cost efficient, she said.

On 10th January of this year, a new project under the Danish Green Ship of the Future project was launched.

This is the ECA Retrofit Technology initiative, which is to test three different technologies' ability to reduce shipping industry's sulphur emissions.

The three technologies are – scrubbing technology, liquefied natural gas as a fuel and low sulphur distillate fuels. They will be compared on the grounds of investment, installation, production costs and maintenance, plus other criteria.

NORDEN is one of the 11 major partners in the scheme and will provide data taken from the hull of the 2008-built product tanker *Nord Butterfly.*

The company is also a partner in SeaMall, a new co-operative of five shipping companies set up to control the cost of essential vessel supplies, such as paints, lubricants, provisions, spare parts and other services needed. The aim is to take advantage of economies of scale and to negotiate more profitable contracts from a position of strength.

NORDEN said that it hoped the purchasing platform could be developed and at the same time provide information about the supply chain and market conditions.

SeaMall is based in Svendborg and it is supported by Clipper, Nordic Tankers, Herning and Pacific Basin, plus NORDEN, giving access to a fleet of more than 250 vessels.

Former TORM head Klaus Kjærulff was appointed chairman of the board of SeaMall supported by Knud Pontoppidan. CEO is Per Nykjaer Jensen - who previously founded and ran the shipping company T&C as CEO until 2003, when the company was sold to the Clipper Group.

At the time of the launch, Kjærulff said; "SeaMall will soon be expanded to include more shipping companies, though our first focus will be on implementing and fine-tuning our systems. With pooled purchase volumes likely to be significant and projected to grow steadily, SeaMall will become a competitive and attractive procurement platform.

"By including in the partnership Hong Kong-based Pacific Basin and its 75 fully-owned vessels, SeaMall has gained an important Asiatic extension to its platform. In the Danish maritime cluster, where the project is supported by the Danish Maritime Foundation, SeaMall will be an important player that can help develop synergies, new opportunities and create value for the benefit of all participating companies", he concluded. TO

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Will Triality be converted to reality?

There has been a slow but steady increase in the number of vessels powered by LNG during the past decade or so. This move to install gas burning prime movers could gain momentum in the next 10 years and beyond, according to leading class society DNV.

Speaking recently in London, DNV CEO Henrik Madsen said: "I am convinced that gas will become the dominant fuel for merchant ships. By 2020, the majority of owners will order ships that can operate on liquefied natural gas (LNG). As a leading class society, DNV has an important role to play in finding more environmentally friendly solutions for the shipping industry."

He was speaking at the launch of an environmentally friendly VLCC design powered by LNG. The conceptual design project, called Triality, has a hull shape that removes the need for ballast water, thus eliminating ballast water treatment systems, plus it will almost eliminate local air pollution and will also recover hundreds of tonnes of cargo vapours (VOCs) per voyage, he claimed.

Triality has been developed through a DNV innovation project. As its name indicates, DNV said that it fulfils three main goals: It is environmentally superior to a conventional crude oil tanker; its new solutions are feasible and based on well known technology and it is financially attractive compared to conventional crude oil tankers operating on heavy fuel oil.

DNV compared its concept with a conventional VLCC. Both designs have the same operational range and can operate in the normal spot market.

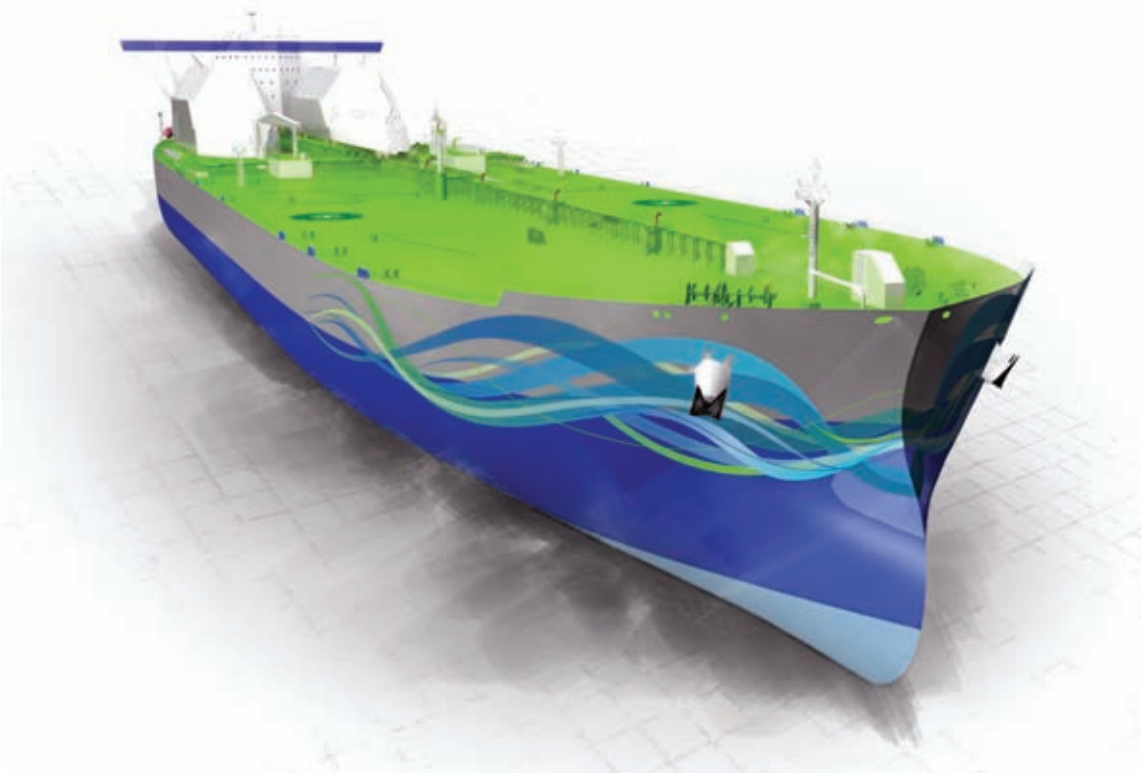
Compared to the traditional VLCC, the class society claimed that the Triality VLCC will:

- Emit 34% less CO2.
- Eliminate entirely the need for ballast water.
- Eliminate entirely the venting of VOCs.
- Use 25% less energy.

Less harm will also be caused to the health of people living close to busy shipping routes and ports as NOx emissions will be reduced by more than 80%, while emissions of SOx and particulate matter (PM) will fall by as much as 95%.

The new concept tanker has two high pressure dual fuel slow speed main engines fuelled by LNG, with marine gas oil as pilot fuel. The next phase of the Triality concept development will review the use of dual-fuel medium speed engines and pure gas engines, DNV said. The generators are dual fuel (LNG and marine gas oil) while the auxiliary boilers producing steam for the cargo oil pumps operate on recovered VOCs.

The VLCC will be fitted with two IMO type C pressure tanks capable of holding 13,500 cu m LNG - enough for 25,000 nautical miles of operation – which are



The VLCC would be built with a different hull form to offset the need to carry ballast water.

located on the deck in front of the superstructure.

A traditional tanker on a ballast voyage needs ballast water to obtain full propeller immersion and sufficient forward draft to avoid bottom slamming. The new V-shaped hull form and cargo tank arrangements completely eliminate the need for ballast water in the VLCC version. There will also be much less need for ballast water on other kinds of crude oil tankers, such as Suezmaxes, Aframaxes and smaller vessels.

The new hull shape results in a reduced wetted surface on a round trip and has a lower block coefficient and thus a more energy efficient hull, DNV claimed.

A VLCC in ballast will normally carry between 80,000 and 100,000 tonnes of seawater containing organisms that can cause damage when released into foreign ecosystems. In addition, a lot of fuel is needed just to transport this extra water and finally, the initial coating and later maintenance of ballast tanks during operations are among a shipowner's main concerns, DNV said.

The Triality VLCC can collect and liquefy more than 500 tonnes of VOCs during one single round trip. These liquefied petroleum gases will then be stored in deck tanks and up to 50% will be used as fuel for the boilers during cargo discharge, while the rest can be returned to the cargo tanks, or delivered to shore during oil cargo discharge.

Triality – Principal Particulars

Length, oa	361 m
Length, bp	351 m
Breadth, overall	70 m
Depth	27.52 m
Maximum dft (loaded)	22.20m
Minimum dft (empty)	9 m
Block coefficient (loaded)	0.60
Block coefficient (empty)	0.52
Location of e/r bulkhead ahead of aft peak	50 m
Location of collision bulkhead ahead of aft peak	330 m
Cargo tank volume	358,000 cu m
Dwt	291,300
Lightship	50,600 t
Service speed (loaded)	15 k
Service speed (empty)	16.5 k
Maximum range	25,000 nm

When it comes to the additional cost of building a vessel such as the Triality and the reduced cost of operating it, Madsen's conclusion was clear: "It is possible to develop an environmentally superior ship and be profitable at the same time. Our best estimate is an additional capital expenditure of 10-15% for a Triality VLCC newbuilding compared to a traditional VLCC. Even with this extra cost included, we estimate a reduced life cycle cost equal to 25% of the newbuilding cost for a traditional VLCC.

"Triality is a concept vessel and a shipbuilder will need to prepare a detailed design before the first Triality crude oil tanker can be constructed. The Triality concept is based on well known and proven components and systems, so in principle a Triality crude oil tanker introducing all or some of the innovative elements in the concept can be designed today. I am convinced that the Triality concept will create great interest among shipbuilders and crude oil tanker operators, so that the first Triality crude oil tanker will leave a shipyard before the end of 2014," Madsen said.

He also said a few shipowners and at least three South Korean shipyards had already looked at the concept with interest. Among those involved in the project either directly, or by providing information, were - DNV's modelling centre in Poland, Innoco and Making Waves, who helped put the project together while MAN Diesel, Hamworthy Gas Systems, BW, Yarwil, Hamworthy Moss, Wärtsilä, OceanSaver, H+H, Couple Systems and others provided the information necessary to complete the project.

This is very much a holistic approach to ship design, DNV explained and is part of the class society's COSMOS research project, which aims at developing advanced simulation tools to optimise vessel energy systems, leading to a new approach to holistic energy system design. It follows the launch last september at SMM, Hamburg of the Quantum concept for gas powered large containerships.

The whole concept was put on the drawing board in only eight or nine weeks by a dedicated team of nearly 40 highly qualified DNV employees taken from many disciplines. Initial workshops, including brainstorming sessions and clarification of the project's needs and scope were held in August/September last year.

Project manager, Torill Grimstad Osberg explained that the task was to develop a concept VLCC, which was environmentally superior to and more economical than

DNV's Henrik Madsen.

conventional VLCC designs, based on technically feasible solutions.

She explained that there three main features identified –

1) The need to carry water ballast is eliminated as a consequence of a new hull design and cargo tank divisions.
2) LNG as a fuel for both main propulsion and auxiliary power. VLCCs currently use heavy fuel oil (HFO).
3) Use of low temperature LNG for – recovering VOC, which could be used as fuel in addition to LNG and marine diesel oil for auxiliary boilers producing steam for cargo pumps. In addition, recovered VOC could be used for cooling scavenging air for the main engines, engine cooling and possibly for air conditioning, freezer/refrigerator operations, plus other uses.

The Triality concept is wider and longer than a conventional VLCC, but consumes less energy. This is mainly due to its reduced wet hull surface and consequently lower frictional resistance, plus its improved hull shape, giving a lower block coefficient, DNV explained.

The following articles describing the Triality project in detail were mainly reproduced courtesy of DNV's Tanker Update magazine, headed by the class society's segment head tankers – Jan Koren. TO

Triality - Ballast free mode

In an unloaded (ballast) condition, ballast water is needed to keep the propeller submerged for efficiency and to keep the bow section from bottom slamming by adding enough forward draft. In addition, ballast is used during cargo operations to reduce bending moments and to compensate for trim and heel.

To have a ballast-free VLCC in operation, some major changes in the hull form are needed. A conventional 300,000 dwt VLCC in lightship condition will typically float with a mean draft of 3-4 m – with the bow and the propeller almost completely out of the water. To increase the lightship draft, a more V-shaped hull was developed by DNV.

The concept vessel was designed to carry a certain amount of cargo. The prime target during the hull design stage was to minimise the resistance and optimise the propeller conditions. A vessel's resistance is normally divided into viscous and wave-making resistance, which becomes important when the speed increases.

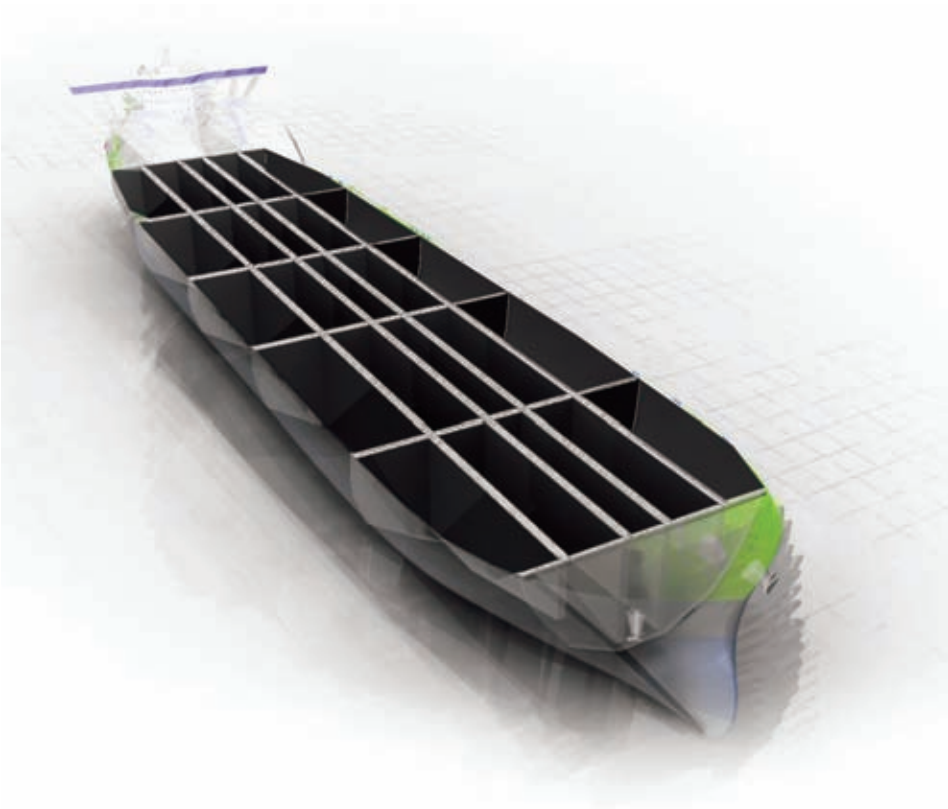
Ballast water is used in a conventional VLCC in two separate ways.

Traditional VLCCs normally operate at moderate speeds and their resistance is dominated by viscous effects, which are proportional to the vessels' wetted surfaces and shapes, which in turn depends on the hulls' geometry. DNV said that its main aim was to minimise the weighted sum of the wetted surfaces in fully loaded and unloaded conditions. Triality would spend about the same time in each condition and therefore, these were weighted evenly. This optimises the total resistance of the complete voyage, DNV explained.

A box-shaped parametric hull was created to minimise the wetted surface for the required displacement. DNV said that some parameters for the submerged part of the vessel may vary, including draught, breadth on keel, breadth, height of vertical side and length. These parameters can result in anything between a wedge and a conventional hull. A wide parameter span was analysed in order to establish the least wetted surface.

By using computational fluid dynamics (CFD), which DNV claimed had prediction accuracy on a par with scaled model testing, the viscous resistance of the new design could be compared with a more traditional design. The class society focused on optimising the bow and stern's pressure fields. High pressure areas in the bow and low pressure areas in the stern should be avoided, as they contribute to a bad shape factor, DNV said.

The optimum diameter and twin screw propellers will allow for a low draught aft when in an unloaded condition. At the same time, high propulsive efficiency is ensured



The VLCC would be fitted with longitudinal bulkheads separating the cargo tanks.

Triality	Base case
Wetted surface - design	
28,000 cu m	28,500 cu m
Wetted surface - unloaded	
20,000 cu m	13,000 cu m
Draft - SG 0.799	
21m	21.5m
Draft - SG 0.875	
22.5m	23m
Draft - unloaded	
10m	6.5m
Propulsion power - design	
18MW	21MW
Propulsion power - unloaded	
18MW	10MW
Block coefficient - design	
0.80	0.53
Block coefficient - unloaded	
0.75	0.62

by overlapping propeller arrangement. The vessel's wake caused by the friction between its hull and the surrounding water is focused near the centreline – similar to a conventional single screw vessel design.

This represents a loss of energy, which is partly recovered by the propellers, as both will contribute to a re-acceleration of the vessel's wake. In addition, the two propellers have the same rotational direction and the overlap arrangement will contribute further to a reduction in rotational energy losses compared to a conventional arrangement.

The propulsion power estimates are based on the resistance and propeller analyses. The conventional tanker needs less propulsion power in a fully loaded condition while Triality reveals its potential in the loaded condition, DNV claimed.

An important element for Triality is that it must be able to carry out cargo handling operations without the use of ballast water, using existing infrastructure and in accordance with prevailing regulations. A traditional VLCC will arrive at the discharge terminal to load cargo with full ballast tanks. Ballast will be pumped out while the vessel takes on oil to avoid high bending moments, list or trim during the loading operation.

As the Triality design does not carry ballast water, the vessel's internal arrangement needs to be such that it will inherently compensate for the bending moments, trim and heel. DNV's solution is a cargo arrangement divided into five longitudinal sections – one centre tank, two intermediate tanks and two side tanks. This can be achieved by having four longitudinal bulkheads instead of two as is the norm on conventional tankers.

By filling/emptying a cargo section along its entire length, no longitudinal bending moments occur, due to uneven cargo weight along the vessel's length, DNV said. Triality will be equipped with a cargo piping arrangement that has been installed for filling, or emptying, a complete longitudinal cargo section simultaneously.

To avoid large heeling angles during cargo operations, the cargo must be prevented from causing heeling moments on board the vessel. Heeling moments are avoided by placing the longitudinal bulkheads to give moment equilibrium around the longitudinal centreline for all segregation alternatives. Moment equilibrium occurs not only when the side of intermediate tanks on both sides are filled with the same segregation, but also when a side tank is filled at the same time as an intermediate tank on the opposite side of the vessel. By filling cargo along the full length of the cargo section, no large trims will occur during cargo operations, DNV explained.

The given tank configuration results in a segregation share thus –

- Segregation 1 = 55%
- Segregation 2 = 25%
- Segregation 3 = 20%

Or

- Segregation 1 = 55%
- Segregation 2 = 22.5%
- Segregation 3 = 22.5%

With regard to cargo segregations, Triality may in principle be loaded in the same way as a conventional VLCC as long as the transverse equilibrium and longitudinal filling along the complete length are maintained. TO

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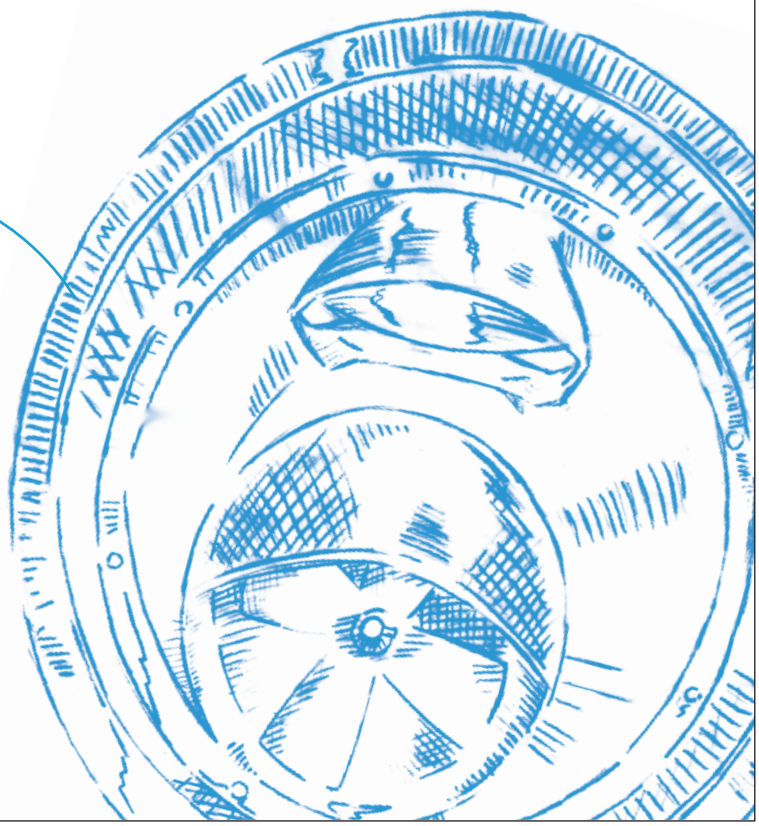


Triality - An operating profile

DNV has also considered an operating profile for a VLCC powered by a gas burning engine to try to measure the economic and environmental performance of such a vessel.

The class society said that a good operating profile should reflect the characteristics of the crude oil market, typical VLCC sailing and operational patterns, availability of LNG for bunkering purposes, plus the effect of ECA expansion worldwide.

Research found that the dominant route was the Middle East Gulf – Asia and the number of voyages undertaken on this route is expected to increase in the coming decades.

There are currently very few LNG bunkering opportunities outside northern Europe and none are suitable for a vessel the size of a VLCC. DNV found that it was technically possible to bunker from LNG storage tanks ashore, or directly from an LNG feeder vessel, or bunker barge. The gas may be transferred via a flexible hose, or a special rigid arm.

Several LNG production and export terminals exist in the MEG, which would prove excellent sources for local LNG fuel distribution. Its distribution is now the subject of other studies worldwide and is expected to be slowly developed during the next few years.

DNV said that in its study, bunkering operations would not affect a VLCC's operation to any great extent. In addition, the introduction of ECAs will have no impact on an LNG burning VLCC, but rather a conventional VLCC, which will have to use scrubbing technology, or change to burning distillate type fuel oil.

The North Sea is already a dedicated ECA and the waters around the US coast are expected to follow suit in 2012. In addition, the Mediterranean and Singapore will probably be designated as ECAs in 2020. Other areas will follow.

To create the operating profiles, DNV chose three representative routes and weighted to make one overall Triality operating profile. The routes chosen were – MEG- East Asia (weighted by 65%), MEG- US (weighted 20%) and MEG- Europe (weighted by 15%).

The operating profile was then calculated by using information on typical port waiting times, port manoeuvring times, plus the time taken to both load and discharge cargo in each terminal. The same calculations were used for a conventional VLCC after taking ECAs into account.

DNV's research showed that a conventional VLCC would spend around 5% of its time in an ECA from 2012, increasing to 8% after 2020. In addition, the ECA emission requirements are expected to become more stringent over time. As the LNG fuelled VLCC will not be affected by an ECA, the operational performance would be enhanced, as the vessel will not have to use scrubbers, or switch fuels.

Triality - Making use of the LNG as fuel

LNG has already proven viable as a vessel's fuel, especially as boil-off gas on LNGCs. However, there are more than 20 other vessels, mainly Norwegian controlled offshore support vessels and ferries, fitted with LNG burning engines. Another gas powered OSV was ordered recently by Eidesvik. DNV claims to have classed the majority of the vessels in operation.

Project manager Torill Grimstad Osberg explained that although LNG-fuelled vessels are in operation, new solutions will be necessary to power a ship the size of a VLCC. For example, the gas will be housed in two 6,750 cu m capacity LNG deck tanks, which will be enough to operate the vessel for 25,000 miles – enough for a round trip to and from the MEG and the US.

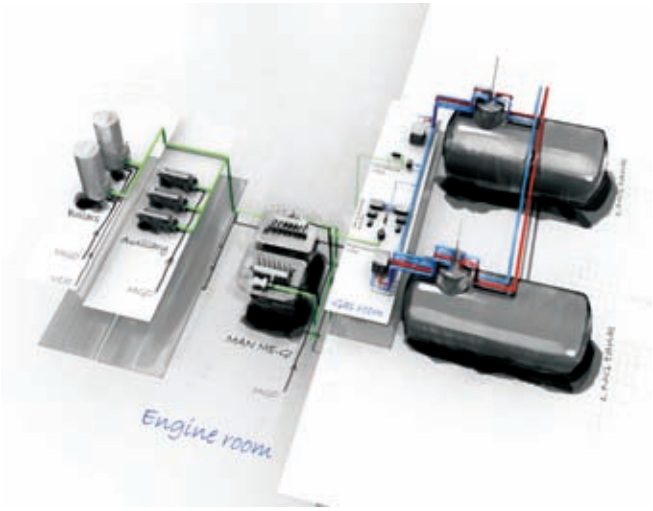
The tanks have been placed on deck due to the ample space usually available on the topside of a VLCC. They will be fitted about 10 m from the vessel's side and their external insulation is protected by the surrounding deck houses, as is protection from a deck fire, or an impact. Their insulated pressure tanks can accumulate boil-off gas for several days without the need for a re-condensation system even if the gas from the tanks is not used.

This IMO type C tank is reliable and results in very simple fuel system operations since the tank's pressure can be used to transfer gas to consumers on board. All the tank connections lead from the domes on top of the tanks to a separate fuel gas room where the necessary process equipment is located. Other tank types have also now been developed for use as LNG bunker tanks – prismatic tanks can provide better space utilisation on board vessels where space is limited. However, this is not generally a problem for a VLCC.

Triality project leader – Torill Grimstad Osberg.

Another difference between small gas fuelled vessels and larger vessels, such as VLCCs, is the introduction of large two-stroke dual fuel engines. This LNG fuelled engine will soon be available from MAN Diesel. It is claimed to have the same high efficiency as more conventional two-stroke engines and will burn natural gas at 300 bar and will use normal fuel oil for ignition purposes.

Osberg said that DNV had developed two versions of a natural gas powered VLCC – one with a conventional hull form and the other with a ballast free hull design. The gas burning machinery and LNG tank installations are the same. However, the more conventional VLCC would be fitted with one main engine connected to a fixed pitch propeller, while the ballast free version will have two main



Gas is transferred directly from the tanks to the main propulsion units.

Two gas tanks are fitted on the deck ahead of the accommodation block.

engines and propellers because of the reduced draft in an unloaded condition.

The generators have been designed for lean burn dual fuel operation and low pressure gas. These four-stroke engines maybe an option as main engines for the ballast free version, but they have not been developed for direct mechanical operation, Osberg explained. The lean burn dual fuel engines have the advantage of already meeting the strictest NOx emission requirements for vessel built after 2016, under IMO Tier III rules, but they are slightly less efficient than a two-stroke engine.

Two-stroke gas engines also directly reduce NOx emissions by about 13% compared to normal oil fuelled engines, but not down to Tier III levels. According to MAN, the necessary reduction to comply with the new rules can be achieved by using exhaust gas recirculation. In addition, the auxiliary steam boilers can burn natural gas and also have the option of burning fuel oil, or VOC.

Low sulphur marine gas oil is used as pilot fuel in the main engines for ignition and back up fuel. This means that even when the two-stroke main engines have to switch off gas operation below 25% loads, ECA sulphur level requirements can be met. As an alternative, the machinery can also operate fully on fuel oil. Within the confines of the project, it has been assumed that the vessel will burn gas in all of its normal operations except during low load situations. Full back-up fuel oil capacity has therefore not been included, Osberg explained. The concept also has what is claimed to be a great benefit, that is the complex heavy fuel oil installations fitted on board VLCCs are omitted.

The gas supply systems for the high pressure main engines and low pressure consumers are different. LNG has a temperature of around -140 deg C at 5 bar pressure, which is about the same as maintained in the tanks. This pressure is sufficient to send liquefied gas to the high pressure pumps, delivering liquid with 300 bar pressure to the high pressure vaporiser, which in turn delivers gas with a temperature of 45 deg C to the main engines. The high pressure pumps are energy efficient and the energy consumption is comparable to that of regular high pressure pumps on diesel engines.

This low pressure system does not have any moving parts as the tank pressure pushes the liquefied gas through the low pressure vaporiser and on to the consumers.

Pressure build-up units are heat exchangers used to regulate the tank pressure. The loop is operated automatically to keep the tanks' pressure within the preset value of 5-6 bar that is needed to supply the consumers. Each tank is also fitted with a submerged pump, which can be used to transfer LNG from the tanks when they are not pressurised.

Emissions reduction gains from switching to natural gas as fuel are claimed to be 94% in SOx and particle emissions, as LNG is sulphur free. Natural gas, which is mainly made up of methane, has less carbon per energy content than oil-based fuels and therefore emits less CO2 when burned. On the other hand, methane itself has a greenhouse gas potential that is 21 times higher than CO2. Four-stroke engines emit some unburned methane, called methane slip, Osberg said.

This eliminates some of the positive effects of the CO2 emissions reduction. The two-stroke engines used in the project do not have a methane slip problem due to a different engine cycle. Some gas will still be released from the piping system during operation, but this is little compared to the 24% CO2 reduction, due to the combustion of natural gas instead of heavy fuel oil, Osberg concluded. TO

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DAMEN DOUBLE HULL OIL TANKER MTS 'SHANNON FISHER'

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Triality - profitability

In its calculations, DNV claimed that Triality has a significantly smaller environmental footprint than a conventional VLCC that burns heavy fuel oil, has a ballast water treatment system and an exhaust scrubber fitted.

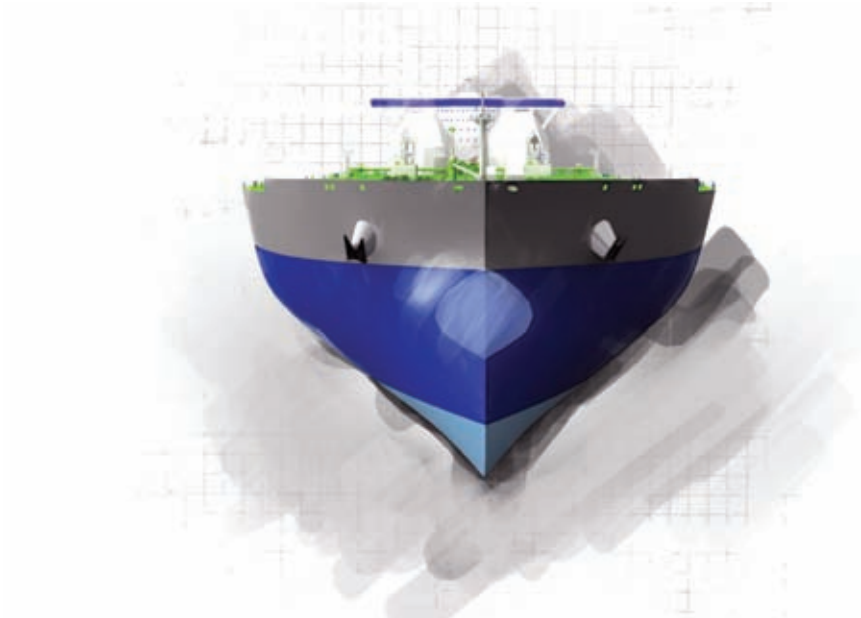
The question is – will the new design prove more profitable to operate?

DNV's financial analysis – investment versus fuel costs for different fuel price scenarios – showed that the concept would be cost-effective thus:

- Improves the expected current value before tax by $24 mill in the reference fuel price scenario – this corresponds to about 20% of the investment cost in a conventional VLCC.
- Is profitable until the LNG price reaches $15 per MMbtu in the reference oil price scenario.
- Is more profitable that a conventional VLCC except in a low oil price scenario.
- Has a higher than expected present value before tax than a conventional VLCC in 92% of cases.

DNV explained that the calculated figures relate to the difference from the base case – a conventional VLCC – and a 20-year life span. Had this lifespan been longer, the figures would have been even more in favour of the Triality concept. In short, the new design does increase the initial investment by $14 mill, but reduces the voyage costs by $38 mill.

Given high and low oil price scenarios, the expected breakeven price is $26 and $6 per MMbtu respectively, DNV said. There are of course major uncertainties as to the future fuel oil price. To make a qualified decision, an investor needs to understand how the fuel price uncertainties and investment costs influence financial performance. An important factor of Triality's profitability robustness is the reduced price uncertainty stemming from the LNG long term bunker contracts.



Triality would be cost-effective, despite costing more to build.

DNV claimed that other tanker types, such as Suezmax, Aframax and smaller vessels, can also benefit from using LNG as fuel to reduce SOx, NOx, CO2 and PM. Their cargo decks normally have plenty of space available for fuel tanks. For the VLCC project, DNV selected duel-fuel slow speed two-stroke engines, which is the preferred type for larger vessels and for those operating mostly outside ECAs.

This type of engine has a high efficiency and is attractive from a maintenance point of view. For loads of below 25%, at present these engines can only operate on fuel oil. When operating within ECA zones, more expensive gasoil may be needed to comply with SOx emission limits.

The NOx reducing properties of medium-speed four-stroke gas or dual-fuel engines are superior to those of the two-stroke gas/diesel engines. So, for tankers operating within ECA areas, either pure gas engines, or dual-fuel low pressure engines may be a better choice, DNV said. This is despite the fact that the installation maybe more complex and include a reduction gear.

The loss of VOC is a challenge for all tanker size ranges. The benefits of using low temperature LNG to prevent this are assumed to be similar for different size sectors. Also a challenge for all tanker types is the ballast water treatment question. There are significant investments involved in addition to the operational and maintenance costs and crew workload. Thus ballast-free vessels would be attractive.

However, DNV explained that there were practical limits on how far down the size scale can be achieved with a ballast-free vessel. Sufficient draught to avoid slamming problems and to allow manoeuvrability must be included in evaluations for ballast-free smaller tankers. There might also be the possibility of reducing ballast volumes, DNV concluded. TO

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ECDIS capabilities and limitations (Part one)

As a follow up to the article appearing in the November/December edition of TankerOperator (see page 35), ECDIS Ltd's Mal Instone* has produced a paper thoroughly examining the use of ECDIS – its capabilities and shortcomings. The paper will be published in two parts, the second of which will appear in the March issue.

As a historical comparison the onset of ECDIS could be said to be as significant as putting steam powered engines and propellers on sailing ships. The comfort blanket of the much loved and respected paper chart is fast disappearing and being replaced by a digital equivalent.

Some embrace this new technology and others fear it. It is therefore not surprising that the rapid advance of this new technology means there are large numbers of vessels navigating with paper charts and ECDIS, or in historical parlance, navigating with sails and engines. This will no doubt continue until adequate training, equipment efficiencies and trust in ECDIS equipment warrants the removal of 'sails'.

For those that distrust these systems, much of the distrust can be put down to the lack of proper training that would give the operator the ability and confidence to use the equipment efficiently and effectively. The need for training is justified by the large numbers of ECDIS related incidents at sea.

We all read about these incidents and with the benefit of hindsight pass judgement, but this could be you joining a ship with ECDIS, without adequate training. Ask yourself whether you would you be able to utilise the system safely and effectively? Are you willing to take the risk of not conducting adequate training? One thing is certain, when used by properly trained operators ECDIS provides enormous benefit for the mariner over existing paper charts.

Such benefits include:

- Increase in spatial awareness and efficiency – this ultimately means the operator has more time to look out of the window.
- Fusion of navaid information – pools information feeds to assist in compiling your picture (eg Radar Image Overlay (RIO), AIS and NAVTEX).
- Increased safety in dangerous conditions – if you can prove the ECDIS derived position correct, you can judge yourself to the nearest point of danger very accurately.
- Fast, accurate passage planning and re-planning.
- Automated, fast, accurate chart updates.

It is my opinion that the concept of ECDIS systems can be likened to that of radar sets. Radar sets are subtly different in the way they look and the software they use, but on the whole they all contain much the same functionality. The challenge is to know where to find that functionality on the system you are using. The existence of multiple systems in fleets makes this challenge greater, although for those that are waiting for the day all ECDIS menus look the same do not get too excited. One only needs to look at radar which has been around for decades to see that it is highly unlikely.

Select with care

It is therefore incumbent on the purchaser to choose an ECDIS system with care so that he or she has the functionality to meet the task (minimum performance standards laid down in IMO A.817(19)). Furthermore, it is essential that adequate training is available so the operator is able to get the most out of the ECDIS and understand both capabilities and limitations of the equipment. Playing around with an ECDIS for a couple of hours is not enough to warrant navigating with it. There is no substitute for proper training.

I have listed some advantages of ECDIS over paper charts, but what does ECDIS offer the operator in terms of functionality and time saving during the route planning process (appraisal, planning, execution and monitoring) and what are the shortfalls of using such systems for this purpose?

1) Appraisal – Gather Information

a) Data - First, without data an ECDIS system is useless. It is the quality of data within it that is the basis for navigational safety. It may therefore be prudent for the would-be ECDIS purchaser to choose a quality, reliable data product first before purchasing an ECDIS that can utilise it, rather than the other way round.

There are two different types of data product available for use in ECDIS, raster and vector charts. Raster charts are high quality scans of paper charts whereas vector charts are databases that use 'objects' in the database to create a customised display. There are official variations of each data type, called raster navigational charts (RNCs) and electronic navigation charts (ENCs). Both terms sound non-specific but are in fact very specific:

RNCs by definition are official charts as their official status is based on the premise that they must be constructed in accordance with IHO publication S-61, ie standardised and issued by a government authorised hydrographic office (HO).

ENCs by definition are official vector charts as their official status is based on the premise that they must be constructed in accordance with IHO publication S-57, ie standardised and issued by a government authorised HO.

With the existence of private data produced by companies independent of HOs, it is prudent to tread with caution in order to ensure that your data product is official.

When installed with data, ECDIS systems can utilise a number of different products of both RNC and ENC format to suit the mariner's needs. The system is also capable of giving visibility of holdings so that you can see which charts are available within your system folio. This can be displayed as a list of available charts or as in the screenshot** over the page, as an overlay similar to that shown in a chart catalogue.

However, the shortfall of the system with regards to data is that ENC coverage of the world is incomplete. Therefore, if your route is not entirely covered by ENCs, then in accordance with IMO Circular 207, the mariner must utilise an appropriate combination of ENCs, RNCs and paper charts to execute the route. Thus, not only does it require careful planning with regard to data use, but also great expense for the mariner.

Here are some considerations when using data:

1. What data products can your ECDIS utilise (SENC data, such as TADS?).
2. Do you have sufficient coverage of ENCs for your route?
3. If you do not have sufficient coverage of ENCs, do you have sufficient RNCs?
4. If using RNCs you are in RCDS mode and you will require an 'appropriate' folio of paper charts in accordance with IMO Circular 207 (www.ecdisregs.com).
5. What is your Flag State definition of 'appropriate' folio of paper charts? (www.ecdisregs.com)
6. The operator must ensure the system prioritises the correct chart data type (ENC/RNC). Know how your system prioritises data.

b) Cell & object interrogation - The obvious advantage when using ENCs is the ability to interrogate it to view information on the cell and objects within the cell (see screenshot). Effectively, it provides access to an encyclopaedia of information that the operator can access. In future, this may include the integration of a huge number of information sources, such as Admiralty List of Lights & Fog Signals (ALLFS), in order that all relevant information is available at the operator's fingertips. However, before you get excited at the prospect, there is a lot of work required before this vision is achieved. Moreover, access to this information on ECDIS systems is not yet as user friendly as it could be.

For example, it is not always possible to get a sufficient explanation of an object, particularly when interrogating ECDIS Chart1 and it can take a long time to find the information required.

Many systems do not prioritise the interrogated object at the top of the list of those available in the cell and as such it can take time to cycle through the list before you find what you are looking for. It should be noted that although RNCs are scans of paper charts, when interrogated they also provide limited information about the chart such as title, scale, projection and updates, but objects within it cannot be interrogated.

c) Tidal & port databases - Some systems offer additional databases such as tidal curves (see screenshot** below, right) and prediction data to aid in calculating HW, LW, tidal heights and predicted TS. However, before committing to such databases, it is worth considering where the data is from, whether it is official data and if or how it can be updated? Not all Flag States approve data provided by ECDIS manufacturers, with some stating that only Admiralty Total Tide (ATT) is acceptable (most systems are able to integrate ATT).

The environmental data in some systems may be official, in that it has been purchased from official sources, but it does not necessarily state exactly where it is from, so be careful. Some systems are able to provide their own database of worldwide ports and port information to aid the mariner, while others can be integrated with existing publications such as IHS Fairplay. If utilising databases provided by the manufacturer then consider how the database is updated and whether information can be updated by the user as changes occur.

d) Safety Contour & Safety Depth - The ability of an ECDIS system to highlight a given safety contour based on a set safety depth is one of the great advantages of the system. ECDIS uses an operator configured safety depth to display a safety contour that differentiates safe water from that which is unsafe. However, the lack of contour data currently available within ENCs means the operator is not yet able to fully harmonise the safety contour with the safety depth.

2) Planning – route creation and checking

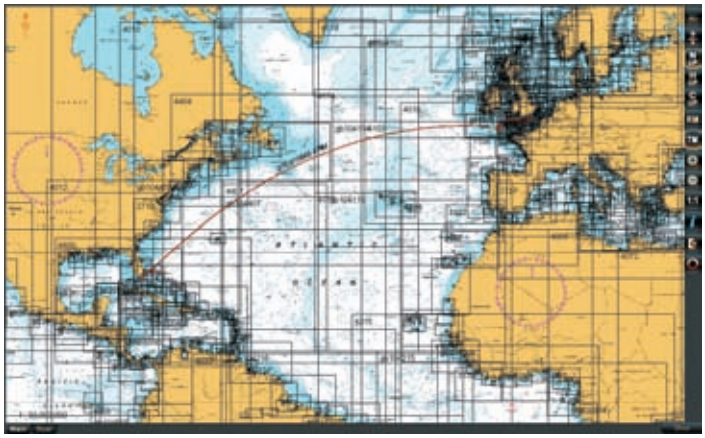
a) Route planning - Route creation on an ECDIS can be fiddly and frustrating to start with, but when practised makes the process much quicker. For example, if you were constructing a Great Circle route on paper charts it would be fair to say that this would require knowledge, skill and a significant amount of time! However, constructing a Great Circle route on ECDIS takes seconds as waypoints are placed at the click of a button. Moreover, there is no need to rub out your past track and re-plan or transfer waypoints from one scale of chart to another, as waypoints are placed on all available charts for its position.

Once the route is complete, you are presented with all the information relevant to the route. Enter your ETD and it will calculate your arrival time based on planned speed, or enter your ETA and it will calculate when you need to depart. If you enter your ETD and ETA the system can calculate the necessary speed required to meet the ETA ie SOA.

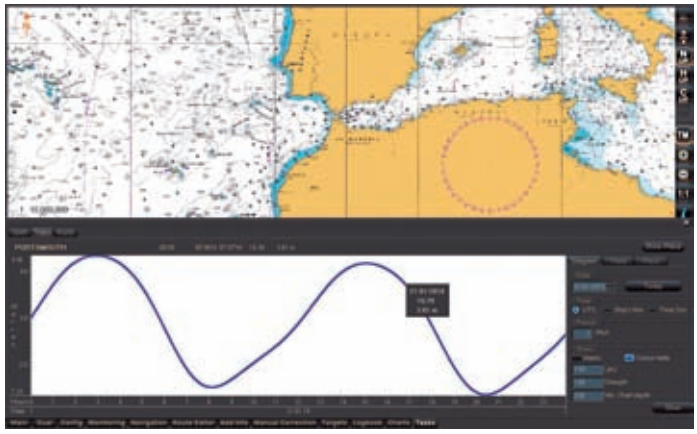
Some systems can calculate the effect of tide on your route timings and even calculate under keel clearance based upon an entered draught. Once the plan is derived it can be saved and used again and again, or even copied to disc and shared among a fleet of ships.

However, the route planning function varies between systems with some being easier to use than others. Furthermore, some systems lack functionality with regard to producing Great Circle routes. For example, not all are able to split the curved line into individual Rhumb Lines, whereas other systems provide detailed options, such as limiting latitudes, number of segments, length of segment etc. It must be noted that not all systems can calculate SOA based upon an entered ETD and ETA.

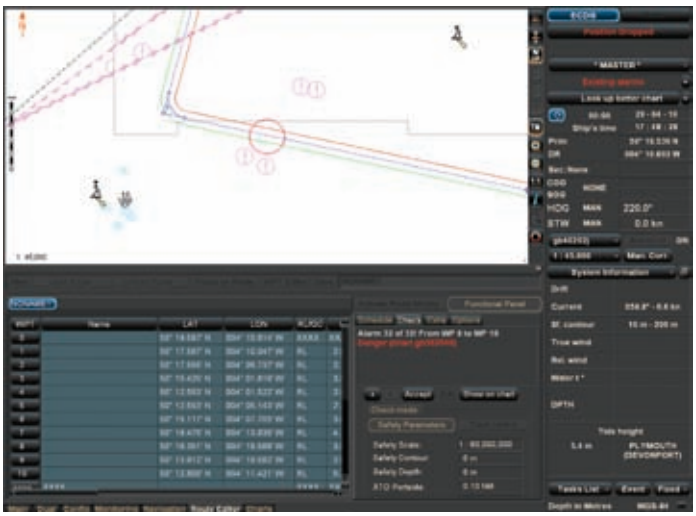
b) Route checking - ECDIS systems have the ability to check the planned route for dangers. However, be careful as the check only looks within the cross track distance (XTD) or corridor of the route, so ensure that it is correctly configured to cover the required area. The wider the XTD the more alarms will



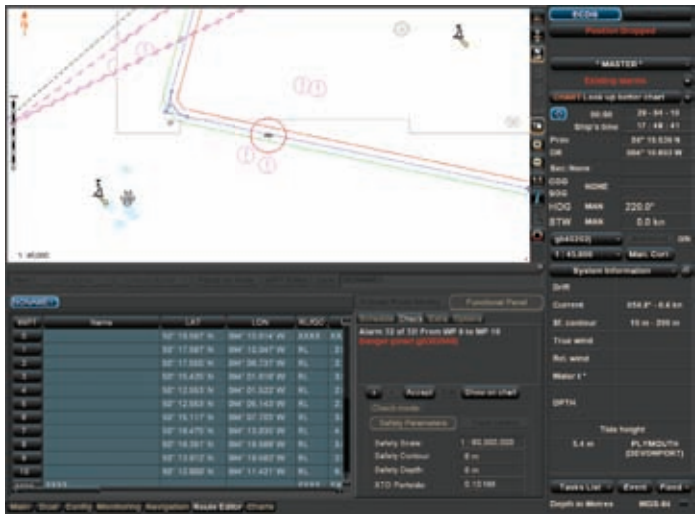
An overlay similar to a chart catalogue.



Most systems are able to integrate Admiralty Total Tide (ATT).



A standard display.



A customised display.

be generated, although this is not a reason to reduce it below what is required.

The check looks for set parameters, which could be system defined, as well as operator defined, depending on the system. If your system offers the ability to configure the search beyond set parameters, ensure that what you want the system to search for is selected. Also, when checking the route it is important to ensure that the correct display setting is selected (see screenshots** above).

In the left hand screenshot the system is in the standard display and the route check is highlighting a danger, although it is not shown. In the right hand screenshot the display has been set to custom and isolated dangers have been selected for display. The highlighted symbol is now displayed (non-dangerous wreck). Another frustration when using ECDIS systems to check a route is that it may highlight the same danger on multiple occasions without recourse for the operator to clear the specific danger in one action.

When conducting the check of the route, the system will only check ENCs and not RNCs, unless there are manual alarmable constructs within the XTD. The inability of most systems to highlight gaps in ENC coverage for your route therefore necessitates that a manual check on the best scale charts be conducted for the entire route. Note that this can be time consuming but comes highly recommended!

Once the route has been checked, additional information pertinent to the route can be added. The system can even be configured to alert the operator of such notices. Considerations at this stage are how best to display the information so that it can be clearly seen by the operator. Note that the font size is constrained on many systems and symbology is also limited. Personally, I used to favour a 'cloud and arrow' approach on paper charts to draw attention to supplementary information, but this is not necessarily available as a symbol in ECDIS. You must therefore make use of whatever is available and what works for you. Perhaps technology will allow the use of light pens to add such information in future? TO

(To be concluded. Part two will be published in the March issue)

**Mal Instone is director of operations & standards, ECDIS Ltd.*

***Screenshots courtesy of Transas and Kelvin Hughes.*

Liquid Cargo Handling Simulator LCHS 5000: Meeting the STCW'95 and 'Beyond'

Training for personnel responsible for cargo operations onboard gas and liquid carriers:

- VLCC/LCC
- chemical and product tankers
- LPG/LEG
- LNG-m and LNG-s tankers
- crude oil and product terminal and FPSO

The simulator is designed for:

- Special training of the tanker personnel (officers and ratings) responsible for cargo loading in control of tanker systems
- General training of officers of any type of vessel in control of the ship's ballast system, control of ship stability and stress occurring in the ship's hull; and protection of environment against cargo leakage pollution

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TRANSAS SETS THE STANDARD

New website launched

A new ECDIS website - www.ECDISRegs.com - has been launched in association with ECDIS Ltd.

This new website provides ECDIS related references, news and articles for the seafarer to make current legislation clearer and easier to understand.

Mark Broster of ECDIS Ltd said, "Finding relevant ECDIS legislation can be frustrating and time consuming, so this new website aims to provide all relevant information in one place. The site is supplemented with expert comment provided by the ECDIS Ltd team in order to help the mariner navigate and understand the mass of legislation that exists. The service is free to view, and has already proven to be very popular."

Winch bollard design aids safe mooring operations

Following on from the UK P&I Club's article on the dangers of mooring operations (see *TANKEROperator*, November/December, page 8), TTS Marine has advised us of its new patented TTS Winch Bollard, which the company claims is much safer and easier to use than the more conventional systems currently available.

The new equipment can replace mooring winches, capstans, warping drums and bollards normally used for mooring, TTS said. Tests have shown that the new system's mooring and tightening of slack rope operations can easily be carried out by one person instead of the usual two seafarers, the company claimed.

The company said that its Winch Bollard contributes to safe mooring operations, as it reduces risks of injuries during mooring and rope disruption caused by too high rope tension on the fixed bollard, or with slack moorings. By fitting the system, a saving on deck space can also be made as there is less equipment needed for mooring operations. It is available both in hydraulic

The stern section of one of the Vela VLCCs showing TTS' Winch Bollards in place.

Winch Bollard basic features

- Compact, clean and water resistant design.
- Direct mooring without use of stoppers.
- One man operated.
- Optimal and safe control during mooring by means of a control stand with a foot pedal, integrated emergency stop and a flexible cable connection.
- Easy controllable fail safe brakes.
- Stepless speed control with high light line speed.
- Automatically reduction of line speed when the load is increased.
- Low noise during operation.
- Self-lubricated bearings for low maintenance.

Standard equipment

- Complete winch bollard with necessary equipment to ensure safe operation.
- Frequency converter with control unit (electrical version).
- Prepared for connection to the vessel's ring line system or HPU (hydraulic version).
- Foundation prepared for welding to the vessel's main deck structure.
- Entire steel structure made of certified steel and sand blasted to Sa 2.5 prior to painting.
- Exterior paintwork: top quality, two-component epoxy/acrylic paint of highest marine standard. Colour according to owner's choice.
- Full set of operating manuals and spare parts list.
- Optional pipe hatch; rope; storage drums; HPU; radio control etc, on request.

and electric versions.

TTS said that the Norwegian Maritime Directorate (NMD) had shown great interest in the positive results of mooring safety when using the Winch Bollard.

Feedback from the two vessels on which WB250 type was mounted was claimed to be very positive. A testimony from one of the vessel's owners said; "We have found the winch bollards to be very useful.

In Scottish waters where we have a large tidal range, ships' moorings require to be tended more frequently. Using TTS Winch Bollards means tending rope s during the night can be a one man operation".

Eight Winch Bollards were recently installed on board four large tankers managed by Vela. They are all installed on the tankers' quarterdecks.

There are three different size ranges available –

- WB250 with a 4 tonne pull force.
- WB400 with a 8 tonne pull force.
- WB500 with a 15 tonne pull force.

TO

Cargo absorption challenges for chemical/product tanker operators

Transport by sea is still the most practical method of moving large volumes of liquid materials in a safe, cost effective manner.

Cargo volumes and the number of different cargoes shipped have grown steadily over the last few decades. This trend is expected to continue to do so as industrialisation spreads and global energy, chemical and food requirements expand.

To enable the carriage of a wide range of materials a chemical tanker owner has to decide between using coated mild steel tanks or stainless steel tanks. As the cost of stainless steel remains prohibitively high for many tanker operators, coated mild steel tanks remain the only cost effective alternative. The correct choice of tank coating to meet the operational needs of the operator is therefore critical.

When using coated mild steel tanks, an important consideration in the industry is the absorption of cargoes into the tank lining. This can in turn lead to subsequent cargo contamination, which can occur as a result of the transport of small quantities of a previous cargo into the next one.

Different coatings absorb, desorb and retain cargoes in different ways depending on the coating type, the cargo in question, the temperature and duration of carriage and so on. When switching from cargo to cargo, the challenge then becomes one of cleaning and recovery in order to return the coating to an acceptable condition ready for the next cargo.

IP's dedicated tank lining laboratory in the UK.

Significant expenditure

Depending on the specific trade patterns and coating type, tank cleaning operations can make for a very significant expenditure in terms of time and money. Couple this with tightening regulations governing permissible cleaning methods and materials and the problem is not going to go away.

Recognising this fact, International Paint spends a great deal of time and resource in its dedicated tank lining laboratory in Newcastle Upon Tyne in the UK, understanding the issue of cargo absorption.

"We study this at a molecular level", explained Paul Devine, product manager for International Paint. "The absorption profile of a cargo into a coating is heavily influenced by the coating technology type but also by the cargo itself. Having an understanding of the most challenging cargoes, in terms of their fundamental chemistry and physical properties enables us to tailor our new product development work to more effectively meet the needs of the industry.

"Low cargo absorption is always a key focus in all of our tank lining development work. We were heavily involved in a project with Marinspec Associates, the aim of which was to evaluate cargo absorption of current tank linings and subsequent transmission into the next cargo and we were very pleased with the results.

"Building on this the aim now, is to move beyond the established technologies and deliver a coating which eliminates cargo absorption in the vast majority of cases, thus massively reducing the likelihood of subsequent contamination, increasing vessel operating flexibility, cutting cleaning times significantly and opening up new trade opportunities for our customers, " he concluded.

Turning to hull coatings, International Paint has claimed success with its Intersleek® 700 antifouling.

The 2006 decision by the National Shipping Company of Saudi Arabia (NSCSA) to apply Intersleek® 700 on the hulls of eight VLCCs has resulted in fuel savings of more than 6% and CO2 emissions cuts running into many thousands of tonnes.

The VLCCs are managed by Mideast Ship Management, the vessel operating subsidiary of NSCSA.

NSCSA which runs a fleet of more than 30 vessels including 17 VLCCs, took the decision to replace self-polishing copolymer (SPC) biocidal antifoulings with International Paint's biocide-free silicone-based foul release coating, Intersleek® 700, when the eight ships were docked successively through 2006 and 2007. The application involved blasting the ships' hulls and coating their vertical sides with the coating.

Since then, detailed performance analysis on board one of the VLCCs, the *Ramlah*, has proven the relative fuel savings and emissions reductions resulting from the use of Intersleek® 700 rather than the earlier SPC antifouling. The analysis covered the whole docking period prior to the application of the Intersleek® 700 system (the previous 60 months) and the on-going performance since the application (up to 54 months to date).

The results demonstrate an overall 6.4% improvement in fuel efficiency which translates into a saving of more than 6,500 tonnes, equivalent to around $3.2 mill at $500 per tonne. Corresponding savings in greenhouse gas emissions mean that more than 20,000 tonnes of CO2 have been prevented from entering the atmosphere from this one vessel. The data has been independently verified by vessel performance specialists, BMT.

"These results are very important for us," said John Willsher, Intersleek® product manager. "They demonstrate that ship operators can not only benefit from substantial fuel savings but that the latest generation of foul release coatings can play a key role in shipping companies' environmental strategies as they seek to reduce emissions. As we have said previously, there are many new technologies currently under development, some quite complex and expensive which do offer potential, but Intersleek® is relatively simple, available now and these results prove the positive impact it can have." TO

Ballast tanks and treatment systems

At a pre-conference focus day held in London early December, the risks of ballast water treatment systems on ballast tank coatings was assessed by participants from the global industry.

Bremen-based RWO claimed to be a pioneer in this field. Thorough corrosion tests undertaken by independent institutes have proved that RWO's CleanBallast ballast water treatment system with its EctoSys® disinfection technology does not increase the corrosive properties of seawater.

RWO - in co-operation with a leading European corrosion institute (SWEREA-KIMAB) and the classification society Germanischer Lloyd – has carried out thorough accelerated corrosion studies in treated full-salinity seawater with the CleanBallast ballast water treatment system. The tests simulated operation over an approximate entire lifetime of a BW tank/piping structure (about 40 years).

CleanBallast operates readily in waters with low and full salinity, RWO said. The natural corrosiveness of those environments differs significantly, with, for example, full salinity (>32PSU) being a very corrosive media to common construction materials. It is also well known that active chlorine has further negative effect on corrosion, increasing the wear rate of non-passivated metals, etc.

RWO's CleanBallast system does not increase seawater's corrosive properties.

The disinfection unit EctoSys® utilised by the CleanBallast system is based on electrochemistry, however, operating very differently compared to, for instance, conventional chlorination systems using salt water (containing chloride), where a maximum production of active chlorine is desired. Instead, EctoSys® produces short-lived mixed oxidants, which together have a more striking and powerful effect compared to active chlorine. Thus, the EctoSys® is not dependent on chloride content (salinity), but produces oxidants directly from the water. The negative effects of active chlorine on corrosiveness can effectively be avoided.

In natural brackish and full-salinity seawater, besides the short-lived oxidants (ie hydroxyl radicals) the disinfection unit EctoSys® will produce low levels (up to maximum 2 mg/l) of more persistent oxidants, summarised as TRO (Total Residual Oxidants). Being oxidising agents, such substances in higher concentrations are relevant for corrosive properties of water. TRO will decay via interactions with, for example, dissolved organic matter. Fig 1 illustrates a typical decay curve of TRO, showing that the natural blank level of 0.2-0.3 mg/L of TRO is reached within approximately two hours.

RWO's co-operation with SWEREA-KIMAB and GL included thorough corrosion studies in treated full-salinity seawater, simulating an approximate entire lifetime of a BW tank/piping structure. These studies were later recommended by the IMO technical group GESAMP-BWWG, as part of the guidance for other vendors developing ballast water treatment studies, to be included in their respective approval process (ref. MEPC 59/2/16, §4.5.1).

The tests included accelerated comparative studies (treated and untreated seawater) using both uncoated steel test specimens but more importantly test specimens with 2-coat paint systems according to NORSOK Coating 3B approved according to DNV classification note 33.1 class B1, common and approved for use in BW tanks, for instance, the Jotun system 'Balloxy HB light'.

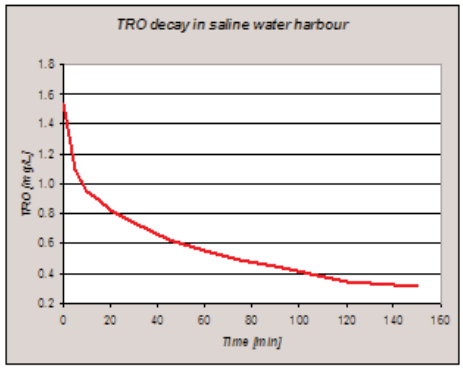

Fig 1: Natural decay of residual oxidants TRO produced by CleanBallast, T=22°C, pH=7,9, Salinity 15PSU.

The tests were carried out in Brest, France and included parallel tests with both continuous exposure to the water and intermittent cyclic exposure of water and air. Intermittent exposure resembles better the real conditions in ballast water tanks and a worse corrosive case than continuous exposure. The tests were accelerated, that is, the exposure of the test panels was set to simulate an approximate entire lifetime of a BW tank/piping system, regarding initial maximum concentration of TRO and natural decay.

The evaluation of the exposed test panels was performed according to the following standards:

- SS-EN ISO 9227:2006 (salt spray 1,440 h).
- SS-EN ISO 6270-1 (condense 1,440 h).
- SS-EN ISO 2812-2 :2007 (immersion 3,000 h).
- EN ISO 15711:2004 (cathodic 3,000 h).

Based on the result of these tests, both SWEREA KIMAB and GL concluded that there are no additional corrosive properties of seawater treated with CleanBallast, compared to untreated seawater. Thus, the tests proved that the CleanBallast equipped with the EctoSys® disinfection unit does not increase corrosion in ballast water tanks. Furthermore, CleanBallast is certified and classified by the GL as compatible with epoxy-based ballast water tank coating systems, RWO said. TO

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Colfax expands pump technology

Colfax Corporation has expanded its SmartSense™ intelligent pump monitoring line to include the new SmartSense Pulse.

Measuring only 2.4 inches long, 1.6 inches wide and 1.3 inches deep, it easily fits near the bearing on a pump to gauge temperature and vibration. At-a-glance LEDs on the unit indicate pump performance and provide preventive maintenance alerts when needed, the company claimed.

Colfax has expanded of its SmartSense™ intelligent pump monitoring line to include the new SmartSense Pulse. Measuring only 2.4 inches long, 1.6 inches wide and 1.3 inches deep, the Pulse easily fits near the bearing on a pump to gauge temperature and vibration.

"Colfax's SmartSense Pulse is designed to enable a level of monitoring that would otherwise require more staff and diagnostic equipment, which would be expensive and impractical," said Dan Yi, a Colfax electronics engineer.

"Temperature and vibration are key indicators of a pump's operating performance," he continued. "Excessive levels of either one indicate a need for adjustments, and having a simple, easy-to-use, automated system to constantly monitor pump conditions should enhance operation, reduce downtime and increase energy efficiency."

The Pulse follows the introduction of Colfax's initial SmartSense system, whose larger control unit, measuring 22 inches long, 20 inches wide and 10 inches deep and additional sensors monitor pressure, wear, cavitation and integrity of the pump's mechanical seal – in addition to temperature and vibration.

The larger SmartSense system's control modules can be accessed through the owner's own data network, the Internet, cell phones, or wireless devices and can operate independently using its own customisable algorithm, or connected to a group of pumps managed from a central office.

Colfax's software for the larger SmartSense system also has the ability to alert operators to the need for parts, with accompanying ordering documentation, for regularly scheduled maintenance or to address replacement needs as they arise, the company said.

Either system can be installed on new pumps during manufacture or added as a retrofit to existing pumps made by any company. They are applicable for a variety of industries using pumps, including marine. A company spokesman told *Tanker Operator* that its small size makes it particularly useful in cramped, on board conditions.

The SmartSense Pulse will be available during the first quarter of 2011, while the larger version is currently available. TO

API completes successful gas carrier commissioning

As well as winning orders for installations on board Palmali newbuildings (see page 12), Aalborg-based API recently commissioning of its first supply of full integrated cargo control automation and remote valve control System for the first vessel in a series of Lauritzen Kosan's six pressurised gas carriers, built at Yangzhou Kejin shipyard in China.

An experienced team of API Marine service engineers worked in close co-operation with the Chinese shipyard representatives and the Lauritzen Kosan engineers in order to provide a fully functioning system, meeting highest requirements of quality and safety.

In accordance with the contract between API Marine and Yangzhou Kejin Shipyard, signed in late 2008 - API Marine delivered full integrated cargo control automation and remote valve control system for a series of six 3,700 cu m pressurised gas carriers, ordered by Lauritzen Kosan.

A specially designed unique dual-functioning system, introduced by API Marine, allows level measurement of liquid and vapour stratification in cargo tanks by using non-contact acoustic GLF (guided low frequency) self-calibrating methods.

API is to fit six newbuilding Lauritzen Kosan LPG carriers with cargo control equipment.

"Successful handover of our advanced integrated system for *Helle Kosan* has been a milestone in the development of API Marine, giving us valuable experience in China and opening vast opportunities in the Asian market, especially in the field of specialised gas carriers", said Sven Egelund Rasmussen, managing director of API Marine.

Commissioning of API Marine equipment for the remaining five gas carriers is scheduled to be carried out throughout this year. TO

ClassNK's guidelines on corrosion resistant steels

ClassNK has developed and released what it claims are the world's first set of standards for the application of corrosion resistant steels to tanker's cargo tanks.

The new '*Guidelines on Corrosion Resistant Steel for COT*' are the first guidelines to lay out clear requirements for the application of the new steels, whose use was approved by the IMO's Maritime Safety Committee (MSC) earlier this year.

The last decade has seen tremendous changes to the building and survey requirements for tankers. Along with the shift towards enhanced survey programmes, double hulls, and ballast tank coatings, recent efforts have been focused on establishing corrosion prevention measures for their cargo tanks.

Amendments to SOLAS requiring such corrosion prevention measures were adopted at the 87th meeting of the MSC in May 2010, and from 1st January, 2013 corrosion resistance measures will need to be applied to the cargo tanks of all crude oil tankers. Along with coatings, MSC recognised corrosion resistant steel as an acceptable corrosion resistance measure and adopted the new 'Performance Standard of Corrosion Resistant Steel' along with the amendments to SOLAS.

Corrosion resistant steel was developed by Japanese steel manufacturers specifically to resist the corrosive environment found in cargo oil tanks, and the new steel promises to provide owners and shipyards with a lower cost alternative to coatings. By using corrosion resistant steels, shipyards can reduce the cost of the construction and coating process and owners can reduce costs from coating maintenance and reapplication.

Although the effectiveness of the steels has been proved on vessels in service and use of this new type of steel was approved by MSC in May, one factor preventing their widespread application was the lack of clear standards for their application. According to Dr Yoshiya Yamaguchi, a manager in the ClassNK equipment & material department who participated in the development of the new steels: "These guidelines fill that gap and make the application of these new steels practical for the entire maritime industry."

Procedures described

ClassNK's new guidelines describe the procedures for application of the new steel in great detail, including area of application, construction work and inspection procedures during construction, as well as the required contents of the technical file. As the new guidelines also cover the requirements for type approval of corrosion resistant steels based on the amendments to SOLAS, the guideline is expected to be of great benefit to steel manufacturers as well.

Dr Yamaguchi emphasised the importance of the new guidelines by saying: "With the development of these new steels and these new guidelines for their application, we have a chance to improve tanker safety while at the same time reducing costs for yards and owners. These guidelines are an important technical achievement, and we are confident they will have a positive impact on the entire maritime industry."

The new guidelines can be viewed on ClassNK's web page.

digital gauging

Honeywell Tanksystem introduces the world's first portable, digital, automatic, topping-off monitoring system.

The HERMetic TOMSYS is a portable, digital, automatic, gas tight, level monitoring system, designed to continuously and automatically monitor the cargo tank liquid level during topping-off procedures. The unit accurately monitors the liquid level over the last upper three meters.
By increasing safety and efficiency, Honeywell Tanksystem helps customers improve business performance.

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***Andreas Sohmen-Pao**, CEO, BW Group*
Session Chairman of the Offshore & Energy Day: Drivers of the Offshore Industry in Asia

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Afternoon
THE ASIAN VOICE IN WORLD SHIPPING: THE MAJOR BULK TRADES

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Morning
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FLAGSHIP-HCA enables accurate hull condition forecasting for improved maintenance and investment

FLAGSHIP, the Pan-European maritime transport project partly funded by the EU, has developed software to forecast the condition of a ship's hull over time.

The software was developed to help improve the efficacy of surveys and reduce the amount of time a vessel is out of service.

FLAGSHIP-HCA (Hull Condition Assessment) is designed to accurately predict the condition of a vessel's structure, coating and components, enabling shipowners and operators to schedule maintenance in a more efficient manner and thereby reduce maintenance costs while improving safety at sea.

The principal economic objectives of FLAGSHIP-HCA are to extend the life of the existing fleet of tankers and bulk carriers by up to five years, with a 10% to 20% reduction in service repair costs for vessels throughout their life-cycle. In this respect, a primary concern for shipowners and class societies is that of corrosion of the ship's structure and this is the software's primary focus.

Ben Hodgson, project manager at BMT group and FLAGSHIP-HCA sub-project leader said: "Management of corrosion is being addressed through separate tools that meet the specific needs of the shipowner and the class society. The enhanced data exchange that these two tools will promote between class and shipowner will quite possibly lead to the development of enhanced class rules which will ultimately lead to better maintained, more available and safer ships."

FLAGSHIP-HCA includes three primary tools, which enable the shipowner and class to exchange hull data in real time, based on crew inspections and maintenance work, as well as periodic measurement campaigns.

First, the toolset includes the survey advisor tool (SAT), which advises surveyors where individual vessels are most vulnerable and therefore where they should concentrate their investigations.

Second, the hull health programme advisor (HHA) optimises the survey and maintenance programme taking in to consideration the vessel's work schedule and its predicted structural integrity.

Finally, the corrosion parameter prediction tool, which takes the results of a survey or set of surveys and update a database if corrosion parameters associated with every aspect of a vessel's hull – based on observed rules and results.

Accurate hull condition monitoring is now possible on tankers.

Designed as a tool for shipowners and surveyors, FLAGSHIP-HCA is claimed to enable shipowners to schedule vessel maintenance and vessel replacement more accurately than has been possible to date. The software not only optimises existing asset lifecycle and investment decisions, but can also provide class with more robust data upon which to base their rulings.

The project was led by the BMT Group in the UK and was supported, delivered and trialled in conjunction with MARINTEK of Norway; Bureau Veritas and Sirehna of France, Germanischer Lloyd of Germany and PORTLINE - Transportes Marítimos Internacionais - of Portugal

FLAGSHIP is a consortium of more than 40 European maritime organisations taking part in a part EU-funded project the focus of which is on improving safety, environmental friendliness and competitiveness of European maritime transport.

The emphasis of the project is on shipboard systems and procedures, shipmanagement systems on shore, impact of new technology on present shipowner/ operator organisations, effective and efficient communication interfaces and impact of standards and regulations.

OMNIPURE passes USCG muster

Severn Trent De Nora's OMNIPURE™Series 55 marine sanitation treatment systems have received final certification from the United States Coast Guard (USCG) to the IMO's MEPC.159(55) effluent standards.

USCG Certification involves testing rigorous environmental standards, such as shock and vibration above and beyond IMO requirements.

The OMNIPURE Series 55 technology utilises an electrolytic treatment process, combined with electrocoagulation to both effectively treat wastewater and provide sanitary solids for handling.

Its electrolytic process generates a powerful oxidant from seawater to effectively disinfect biological wastes. The systems range in capacity up to 65 cu m per day as individual units that can be combined for increased capacity. The systems provide effective electrolytic treatment of both black and gray water through a proprietary and certified treatment process.

Stability risks with ballast water exchange at sea

The North P&I club has warned shipowners to take great care when attempting to comply with ballast water rules by exchanging ballast water at sea.

The club says in the latest issue of its loss-prevention newsletter 'Signals' that without a meticulously prepared and implemented procedure for ballast water exchange, vessels face a serious risk of a loss of stability.

According to risk management executive, Simon MacLeod, "The 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediments (BMW Convention) needs to be ratified by just three more states with 10% of world tonnage, but many countries have already introduced their own regional mandatory ballast water requirements - many of which are based on IMO guidelines."

The new regulations are designed to prevent the introduction and spread of harmful marine organisms by shipping and one of the most common ways of complying is to exchange ballast water on passage. "However, this can pose significant stability risks if a proper plan is not developed and rigorously followed on board," said MacLeod.

North reminded shipowners that emptying and refilling ballast tanks can significantly reduce a vessel's stability, both by reducing ballast weight but also by introducing free-surface effects. In dynamic deepsea conditions, this can potentially lead to an angle of loll and ultimately capsize.

"An angle of loll is very dangerous situation and should be corrected as soon as possible," said Macleod. "However, the effects of corrective actions should be carefully calculated to ensure matters are not made worse.

'Given the potential risks associated with deepsea ballast water exchange, it is critical that a proper plan, including the sequence in which the tanks have to be emptied and refilled and the weather limits to be observed during operation, is carefully developed and implemented.

"Full use should be made of the vessel's stability book and loading computer in developing the plan," he warned. TO

MPRI upgrades liquid cargo training simulator – Safe cargo

Integrated training solutions provider L-3 MPRI, has released Version 5.0 of its liquid cargo handling simulator (LCHS) software called 'Safe Cargo'.

This upgrade incorporates significant improvements to the performance, instructor features and configuration options currently available in the software suite. It is fully compliant with the latest Windows® operating systems and incorporates a new network communications infrastructure that vastly improves the speed and stability of the simulator, as well as system diagnostics and recovery, the company claimed.

"Version 5.0 of our Safe Cargo software capitalises on L-3's extensive experience in liquid cargo simulation and feedback from our valued customers," said Dennis Corrigan, senior vice president and general manager of L-3 MPRI's training systems group. "This latest release provides our customers with the broadest, most flexible and effective system available and includes all the tools required to meet the training and assessment requirements of the forthcoming revision to the Standards of Training, Certification and Watchkeeping (STCW) and other specialised training applications."

The redesigned instructor interface ensures the system is easy to use, minimising the amount of training required before instructors can use the system effectively, while building upon all the existing functionality that Safe Cargo software has successfully provided for the past 20 years. The configuration wizard allows an instructor to quickly define the required simulator configuration for the training exercise, selecting from multiple ship types, and assigning the student stations to be operated independently, or in groups.

Once defined, configurations can be saved and reloaded in the future with a single click of a button, providing considerable flexibility. New tools are also available to simplify the monitoring of each of the student stations and the recording of student actions, with integration into the WISE Virtual Instructor and Competence Assessment tools.

The new software additionally features the option to incorporate real hardware consoles or virtual panels with the appropriate gauges and controls, allowing lifelike simulation of a fully operational cargo control room environment.

MPRI's LCHS has been installed at Warsash since June 2010 and has recently been installed in State University of New York (1 + 14) upgrading the existing system. A new installation was recently delivered to YASA Shipmanagement, Turkey and the International Maritime Training Institute in Panama.

The system will also be installed on the back of contracts in Manila and Indonesia in the near future.

NEI wins major BWTS patents

NEI Treatment Systems VOS™ ballast water treatment system has been granted patents in Japan and South Korea.

Patents for NEI's unique BWTS technology were previously issued in the US, Canada, the European Union and other key jurisdictions in Europe and Asia, representing 22 major flag states where the company's intellectual property is now protected. Remaining NEI patents are currently pending in China, Brazil and Turkey.

Issuance of the Japanese and South Korean patents for the VOS™ BWTS represent a key milestone for NEI and its technology licensees – Mitsubishi Kakoki Kaisha (MKK) of Japan and Samgong of South Korea.

Commenting on the patent approvals, CEO Jon Slangerup said: "This is an important step forward for the company and for our strategic partners in Japan and South Korea, further strengthening our position in two of the largest shipbuilding and ballast water management markets in the world. MKK and Samgong have both made significant investments in the resources needed to aggressively pursue and capture the BWTS business in their respective markets, and these patents are key to this mission."

MKK and Samgong have built manufacturing, assembly and test facilities to support their market plans for the VOS™ BWTS.

NEI's partnerships with MKK and Samgong extend beyond exclusive VOS ™ licensing rights to also providing manufacturing and logistics support for the company's global marketing activities. TO

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