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COMMENT

‘Nothing breeds success like success’

Those attending the biennial SMM exhibition and attendant conferences in Hamburg at the end of September would certainly attest to the old saying.

The current shipbuilding boom has had a huge knock on effect on the marine equipment industry and of course on the shipbuilders themselves. Everything seems to be at record levels - freight rates; newbuilding and secondhand prices; order books, both for ships and equipment; company turnovers and so on.

This somewhat euphoric situation was reflected in more halls.

Can the level of excitement be sustained? Most of the forecasters are naturally cautious given the huge amount of tonnage due to be delivered between 2006 and 2009. Depending on who you believe, there are 1,500 or 1,700 tankers on order as at mid-year. Some 150 of these are in the VLCC size range, while another 337 are gas carriers.

According to Jurgen Kennemann, chairman of German shipbuilding industry association VSM, there could be a newbuilding price war in the coming four or five years. This is due to the rapid expansion of shipyards worldwide, especially slowdown in the fledgling LNG sector, due to receiving terminals being years late in coming on stream. The Russians are also playing political games with the huge oil and gas developments of Sakhalin I, II and Shitokman, leaving oil majors and others hanging in mid-air, but are exporting oil by the suezmax and aframax bucket full from the Black Sea, Baltic and through the various pipelines.

Clarkson’s Martin Stopford has already joined the bears in forecasting a cyclical downturn, which is bound to occur at some stage soon. Hopefully, tanker owners, operators and others have put something aside for a rainy day.

The aframax fleet is expected to grow by 10% this year, following an 11% hike in 2005.

Hamburg where 1,699 exhibitors from 50 countries crammed into the 12 halls and played host to an estimated 45,000 visitors. There were even another potential 300 exhibitors locked out, due to lack of space, a situation that the management hopes to rectify come 2008 by building even in China and to a lesser extent India and Vietnam, which would result in greater capacity during a period of a possible downturn.

We are already seeing cutbacks in the containership sector in certain areas as Maersk attempts to upstage everything in its path by economies of scale. There is a rainy day, but those considering or planning IPOs soon, may decide to postpone their entries into the world’s stock markets for a little while.

Even though rates are dropping slightly in the energy sector, they are still way above daily operating costs in most cases with only the single hull older tonnage causing concern. There are forecasts of a weaker fourth quarter due to a drop in OPEC production and a build up of large tonnage, which will impact on November liftings. About 10 VLCCs are due for delivery by the end of the year and a further 32 VLCCs are due for delivery next year, representing 6.7% of the total fleet, according to Drewry Shipping Consultants. By the end of this year, the number of aframaxes will have increased by 10% this year, against 11% in 2005, adding to the glut of tonnage becoming available.

Some creative tanker owners and operators have come up with grandiose schemes to convert their single hull vessels into FPSOs, heavy lift ships and other floating facilities when the crunch comes sometime after 2010.

This writer well remembers a scheme put together by Sea Containers’ Jim Sherwood in the late 1970s/early 1980s whereby laidup VLCCs were to be converted into giant caravan carriers taking holidaymakers across the Atlantic until it was explained that a VLCC would probably take 10 days to cross the ‘pond’ and the idea thankfully didn’t get any further.

This time around it is not only crude carriers that have caused shipyards to burst at the seems and put up the ‘full up’ signs until 2010, but also the chemical/products tanker sector, which has witnessed unprecedented ordering. However, here the economics appear more sound as there is a definite increase in the shipment of products around the world on the build up of refinery capacity, especially in the Middle East and the increased movement of products, for example heating oil, to the US and the fast developing world that is China and India.

Where does all this leave the tanker industry? Basically, holding its breath.

The aframax fleet is expected to grow by 10% this year, following an 11% hike in 2005.

John G. Basham
Changing the Culture

Leading Norwegian class society Det Norske Veritas (DNV) has launched a new service aimed at reducing the level of accidents on board ship by addressing the changing safety culture within shipping companies. DNV claimed that there is a huge potential for cost savings and to build up a competitive edge by reputation. Out of the 80-90% of accidents that are put down to human error, around 60% of these are related to poor situational awareness.

The DNV SafeX service analyses the safety culture and attitudes, defines the overall safety performance and implements the necessary changes to ensure safety excellence on board ship. The goal is to change a company’s entire corporate safety culture and to maintain this change in the long term.

Jan Erik Granholdt, DNV’s head of environmental and technical solutions said this project is not an "all-out effort - it is an ongoing and proactive approach to safety issues." He felt that the ISM Code didn’t address the human factors properly and that something else was needed.

A prototype scheme has been in operation for two years and nine owners have already signed up for the service. Granholdt said the target was to sign up 25 companies in the next 12 months.

DNV found that motivation was a key issue. Some 30% of seafarers were not following instructions properly on board a vessel. One of the areas for concern was the spate of accidents on chemical carriers, which is under examination by several different organisations on a joint basis.

Granholdt thought that the number of crew changes taking place was one problem that should be addressed. Many owners have told TANKEROperator that crew retention is high on their list of priorities, a point identified by DNV as a cause for concern. In 2001, DNV formed DNV Maritime Solutions, which is an in-house management and technical consultancy. Les Chapman, manager for Northern Europe and Africa, said the aim was to hand back 10 times the cost to the customer.

Chapman claimed that the consultancy was the only one able to handle both the management and technical side of shipping - from boardroom to the engine room. He said that each task was tailor-made for the client as obviously each client has different needs.

A number of specific DNV competences can be offered including:

- Strategy and Business Development.
- Enterprise Risk Management.
- Operational Excellence.
- Safety Excellence.
- Technical Excellence.
- Financial and Commercial aspects.
- Environmental Excellence.

One example given by principal consultant Stephen Bligh was that by examining functions, such as coatings, hull and propeller polishing and scrubbing and measuring the results, some 10% fuel savings per year is possible.

Continued on p4
NEWS

Continued from p3

The consultancy is also helping tanker owners cope with the rigours of TMSA, enabling them to get up to Level 3, or 4 Bligh claimed. He described Level 1 as being on par with the ISM Code.

Chapman said the consultancy differed from others in that it could be a continuous process, rather be a third party that comes in to do a specific job and then leaves. Changing the culture of a company can take up to 12 months to achieve, hence the longevity of assignments.

The consultancy started in 2001 with just one person, but has since grown to a grouping of 75 people with offices in London, Singapore, New York and Oslo, the corporate headquarters. Work has been undertaken with virtually all the oil majors, while financiers have taken advantage of the consultancy’s due diligence service.

Today, much of the work is repeat business, which has come by word of mouth, rather than by marketing. However, the group has started to raise its profile, but will not become independent from DNV unlike ABS and ABS Consulting, Chapman said.

By 2010, the consultancy aims to have around 20-30% of its business outside the traditional classification and compliance remits. At present, this type of work represents around 10% of the business handled.

Tanker HR forum formed

At a time when the world’s shipping industry has become very worried over the lack of expertise available both afloat and ashore, some of the world’s leading tanker owners, shipmanagers and freight trading companies have agreed to form a human resources and benchmarking forum to produce reliable salary and compensation data.

Driven by some of the largest names in world shipping, including Teekay, Eletson, BW and V Ships, the new club is the brainchild of UK recruitment specialist Spinnaker.

Many other industries have long taken for granted the availability of benchmarking data, but it has been notably absent in shipping, Spinnaker said. Supply and demand for both technical and commercial personnel have been underpinned by the roller coaster freight and newbuildings markets of the last few years. And as industry labour becomes ever more globally mobile, world-class HR practices and reliable compensation data are critical factors in enabling companies to compete.

The founding members of the forum, who also include AET, Cargill, Vela, and Euronav, said that they will be inviting other tanker and gas carrier owners, operators and freight traders to join the forum. Spinnaker Consulting, has been asked to act as secretariat and manager to help to ensure that the data provided remains of a confidential nature.

Spinnaker’s chairman, Philip Parry said: "The twin focus for HR professionals is staff attraction and retention. The club will give access to information that will help the leading players set compensation and benefits levels to attract and retain staff. "HR and benchmarking clubs are familiar in many industries. They are a low cost, confidential way to enable employers to share data, in the knowledge that it will be kept confidential by the independent secretariat."

The tanker HR and benchmarking forum’s inaugural meeting will be held in London on 27th October when the founding members and others who wish to join will finalise the club’s remit and bylaws.

The horizon is blue

Maersk Tankers plans to expand its fleet by around 14% per year through to 2009 in order to become one of the top three tanker operators in the world, division head Soeren Skou was quoted as saying in the Danish newspaper Boersen.

"Our total fleet has grown by close to 9% per year over the last five years, but we expect to grow by 14% per year up till 2009," Skou reportedly told the daily.

Maersk Tankers is currently quoted as the fourth or fifth largest tanker operator in the world, but the ambition is to make the world's top three within three years.

A Maersk company spokesperson told TANKEROperator that the division was in expansive mood and that the newbuilding details were on the website, which indeed revealed the true extent of the newbuilding programme.

Briefly, by 2009 Maersk Tankers will have taken delivery of nine VLCCs, six LR2 products tankers, 13 MR products tankers, two handysize products tankers, seven small products/chemical tankers, four fully refrigerated LPG carriers, three semi-refrigerated LPG carriers and six LNGCs.

In addition, Maersk commercially manages several other tankers, mainly smaller vessels.

A Danish finance concern Danish Equities, part of Dansk Bank, recently valued the tanker newbuildings at $3.5 billion. Dansk Bank is an associated company of the Maersk group.

In a separate move, the London operation, formerly Maersk UK, has been split into two units. The shipping operations department, including technical operations, recently moved to Newcastle while, Maersk's container division moved to the former P&O Nedlloyd offices in London’s Aldgate.

The Mariners’ Role in Collecting Evidence, Third Edition 2006

Re-written by Dr Phil Anderson and published by the Nautical Institute, this book is split into seven sections, covering:

- General Guidance.
- Cargo related incidents.
- Ship related incidents.
- People related incidents.
- Environmental incidents.
- Commercial/Operational incidents.
- Codes reports and reference material.

It has been re-written to include the influence of the ISM Code on accident and loss prevention. This system has to be audited regularly and records how the ship and owner/operator monitor safety and environmental policies.

At the book’s launch, Anderson explained that this information will be examined whenever there is an incident and the ISM Code is now an integral part of collecting evidence. He said he wanted to demonstrate the significance of this development in the book.

Capt Nick Cooper, Nautical Institute president said “It is often hard to sell the idea to shipowners that acquiring good evidence following an incident is the best loss prevention strategy available.”

The Mariners’ Role in Collecting Evidence, 400 pp, price £27.50, is available from the Nautical Institute, 202 Lambeth Road, London SE1 7LQ.
Innovative VLCCs delivered

A couple of interesting VLCCs were recently delivered from Japanese shipyards, which are worthy of mention.

The first is the 300,866 dwt Kiho, which was delivered from IHI’s Kure yard on 28th August and was built to the so called ‘malaccamax’ dimensions. For low resistance and fuel consumption, IHI’s proprietary hull form, including the LV Fin and AT fin, was used.

This hull form was designed by advanced structural analysis technology. For example, the structures and fittings of the double hull water ballast tanks were designed for ease of access for inspection purposes, gas detection, inert gas introduction and ventilation.

Kiho is claimed to be the world’s first VLCC to be fitted with an electronically controlled diesel engine, a Diesel United built Wärtsilä 7RT-flex84T-D, developing 27,160 kW at 74 rev/min, giving a service speed of 15.5 knots. Optimisation of the engine tuning can be achieved at all load conditions, helping to reduce NOx emissions and to reduce fuel consumption.

In addition, an ADMI TSS is installed. This is a technical support system developed by IHI and Diesel United, which constantly monitors the inspects the machinery on board the VLCC. All the information is displayed on one screen, while sampling data is also automatically sent to the shoreside management team and engine builder for analysis.

Meanwhile, Mitsui Engineering & Shipbuilding (MES) handed over the 302,478 dwt Kasagisan on 2nd August.

This is the third VLCC to be delivered having been built to Mitsui’s Malacca doublemax design since May 2005. Kasagisan is fitted with Mitsui’s integrated propeller boss and wing (MIPB-Wing), which has been recently developed to increase propeller propulsion efficiency. Both the service speed and the fuel consumption have been improved in part by developing a new bow and stern form.

The Mitsui-MAN B&W 7S80MC-C diesel engine, developing 27,160 kW at 76 rev/min, is fitted with the electronically-controlled lubrication system for the cylinders to help decrease the vessel's operating costs and a steam turbo generating system has also been fitted to recover thermal energy from the main engine's exhaust gas. Other installations include a fixed type flammable gas detecting system arranged in the ballast tanks and the pump room.

MAN buys Pielstik

MAN Diesel has bought the remaining 33.4% shares in SEMT Pielstik from MTU Friedrichshafen.

The acquisition and transfer of shares became effective on 1st January this year retrospectively. Neither party would disclose the purchase price.

This move gives MAN greater inroads into the medium speed diesel engine market.

Since 1988, SEMT Pielstik has been jointly run by MAN and MTU, first as a 50:50 joint venture and since the beginning of 1998 in an arrangement whereby MAN held two thirds of the shares and MTU one third.

MTU will continue to develop its core market in the field of high speed engines.

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NEWS

‘Poseidon Challenge’ publication launched

The Poseidon Challenge publication was launched recently in Athens on board the schooner Mania in the lee of Cape Sounion and the Temple of Poseidon. It is a summary of the expressions of support and commitment of leading influential and authoritative figures of the maritime world.

They met earlier this year at Intertanko’s Singapore event during the first Poseidon Challenge day, to express their own ideas and add their individual stamp committing to:

- Work more closely with others inside and outside our sector.
- Improve the health and safety of our employees.
- Focus on our stewardship of the marine environment.
- Advance our individual efforts to raise the bar and excel.

On board the schooner Mania (courtesy of Capt Panagiotis and Nikos Tsakos) to support and explain the Poseidon Challenge were - Stephen Van Dyck, chairman of the Poseidon Challenge (and chairman of Intertanko); Emmanuel Vordonis, vice chairman of Poseidon Challenge (and executive director of Thenamaris Ships Management); Nicky Pappadakis of AG Pappadakis, chairman of the Hellenic Marine Environment Protection Association (HELMEPA) and chairman of INTERCARGO; Yiannis Andreopoulos, technical adviser to the Union of Greek Shipowners; Levent Ballar, general manager of the Turkish Marine Environment Protection Association (TURMEPA) and representatives from the Ministry of Greek Mercantile Marine.

The Poseidon Challenge is a long-term part of the work programmes of all those who adopt it. It stands for, as they aspire to achieve continuous improvement, and set (and achieve) new goals of excellence - including striving to achieve zero fatalities, zero pollution, zero detentions.

It is designed to encourage people to work effectively together, including with other sectors. Participants have expressed a common desire to make a difference in the way they, their companies and their sectors work.

Stephen Van Dyck said: “Each and every participant is here to make a commitment to continuous improvement and to make it stick. It’s about improving the way we run our businesses. We need to have people here who really want to be here, who want to make a difference. Basically it’s all about changing what we do. If you do what you did, then you get what you got.”

Emmanuel Vordonis commented: “Revitalising our spiritual values will take us beyond fundamentals to a higher level of excellence. The Poseidon Challenge can re-import our heart and our soul into management systems and into our human behaviour thereby bringing us nearer to achieving true excellence.”

Graham Westgarth, president of Teekay Marine Services added: "Poseidon Challenge is about an obsessive and sustained commitment to best practices, a willingness to embrace change, an openness and desire to learn from our mistakes. Ultimately if it is not supported by time, energy, money and passion, it won't work. We have to walk the talk.”

Impounded off Estonia

Hard on the heels of the Poseidon Challenge initiative comes the Solar 1 disaster in the Philippines and the rather bizarre case of the combination carrier Probo Koala.

The case of the Solar 1 will be highlighted in the November/December issue of TANKER Operator.

As for the 48,000 dwt combination carrier Probo Koala, a team of nine investigators from the Ivory Coast was due to leave the so-called toxic ship as TANKER Operator went to press. At the time, the vessel was still detained off Paldiski, Estonia.

According to local news agencies, the Ivorian state prosecutor who is leading the delegation said that he wanted to obtain documentation and extracts from interviews with the vessel’s crew. He claimed that the Estonians were a “big help in the investigation.” However, questions still remain over the ship’s actions while at sea, and over the health of its crew.

European environment commissioner Stavros Dimas, who visited the ship in Paldiski, said that tests had revealed the presence of toxins in the blood of the Probo Koala’s crew. Local authorities could not comment on the claim, the agency said.

Interest had also been aroused by the fact that it took almost a week for the vessel to steam from the Latvian port of Ventspils to Paldiski during September - less than a day’s sailing.

The company which chartered the tanker, Dutch energy trader Trafigura Beheer, maintained that it anchored at sea to avoid accruing port fees.

But according to Estonian prosecutors, chemical evidence from the ship’s wastewater indicated that it had been refining petrol illegally at sea, adding chemicals to low-grade oil. In September, a Dutch newspaper made a similar claim.

Authorities in Ivory Coast launched a criminal investigation after the Probo Koala unloaded several hundred tonnes of a liquid, which was described as ‘slops’ - in Abidjan last August.

It was alleged that this liquid was ultimately dumped on city rubbish tips, leaking fumes, which killed eight and left tens of thousands in need of medical attention. The crisis led to the resignation of the Ivorian government.

The Probo Koala reached Paldiski in mid-September and asked permission to unload 600 tonnes of waste. Environmental inspectors who analysed the waste reportedly found high levels of toxins ‘very similar’ to those in Abidjan.

The Estonian authorities launched a criminal investigation and impounded the ship.
**Products Trades and Earnings to Increase**

Continuing the analysis of McQuilling’s Tanker Market Outlook 2006-2010 (see September issue page 12), the report also took a look at the clean products trades. Overall, the trend forecast is higher for the five years under review.

This is mainly due to increasing consumption requirements in the western hemisphere. For example, a rise in gasoline imports into the US, and Asia and products being shipped for longer distances, thus increasing the tonne/miles ratio.

Longer haul products trade will be undertaken by increasingly larger coated vessels – primarily panamax, aframax and even suezmax size vessels. This transition to larger vessels will depend to a certain extent on the capabilities of the discharge ports to handle them.

In total, the aframax fleet grew by an average of 3.3% per year between 2000 and 2005, but over the same period, the coated aframax fleet grew by an average of 7%. By the end of last year, the coated aframax fleet accounted for 17% of the total with 10% being ice class. About 22% of the aframaxes delivered this year will be coated.

As for the panamax fleet, during the same period, coated vessels grew by 13.2% per annum, compared with a total growth rate of only 2.6% per annum. Interestingly, says McQuilling, the coated panamax fleet accounted for 46% of the total fleet at the beginning of this year, compared with 28% at the start of 2001. At least 65% of all panamaxes delivered or scheduled to enter service this year are coated. Of the current fleet around 20% is ice class.

Some 40% of the MR Fleet is made up of pure products tankers with a further 20% being chemical tankers having IMO III classification. These often switch between chemical trades and oil products, depending on market conditions. In the MR sector, trades are more widely distributed.

Overall demand for panamax and aframax tonnage decreased between 2001 and 2005, mainly as a result of the 2003 Venezuelan strike, which had a dramatic impact on crude and dirty products trades, drastically reducing demand, which never fully recovered during the period.

In contrast, demand for coated vessels in these size ranges during the period increased with aframax demand being 14% higher in 2005 than in 2001 and for aframaxes the figure was 25% higher.

Despite a constant MR supply overcapacity relative to demand since 2002, rates have been going north since then. Even taking into account growing oil demand and the effects of the revised IMO 13G phase out requirements through 2010, rate strengthening is likely to continue. McQuilling expects rates to remain flat in the Caribbean for clean products trades and grow slightly in the Asian trades through 2010.

The coated panamax fleet has shown an increasing in supply overcapacity relative to demand over the past few years, but from 2008, the consultancy expects this situation to ease and rates to strengthen through 2010. Moderately increasing rates in the clean aframax trades are also forecast, especially in the east.

Oil products moving increasingly longer distances as new refinery capacity comes on stream in non-traditional areas, will increase the demand for coated panamax and aframax tankers in particular. Much of this new refinery capacity is currently being built or planned in the Middle East and is set to double to more than one million barrels per day by 2011. Capacity at the world’s largest refinery in Jamnagar, India is set to double to more than one million barrels per day by 2011.

The year 2010 represents a watershed in the tanker industry when a large number of vessels would be required to leave the fleet. For example, in the MR sector, 119 vessels could be on the way out. However, this is unlikely as by then several might have passed the condition assessment scheme (CAS) and be allowed to trade beyond 2010. McQuilling calculated that 52 out of the 119 will have to exit the fleet for various reasons, including age and belonging to a flag state, which insists on single hull retirement by that date. This could result in an upside potential for rates.

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Liquimar's 46,000 dwt MR High Nefeli seen at Fawley recently.

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Anglo’s Fleet to up by 25 per cent

Anglo Eastern Shipmanagement, one of the world’s largest shipmanagers, reports that it expects to increase its fleet size by 25% to 227 from 188 vessels vessels through 2006. Quite astonishing growth for a company which had only 95 vessels in its fleet in 2000, and 133 vessels on Jan 1 2002, writes Karl Jeffery.

The shipmanagement concern employs 9,600 seafarers. Of this total, 69% of its officers, and 58% of its ratings, are of Indian origin. The company has won an award from the Indian government three years running (2002 to 2004) for the best foreign employer of Indian seafarers.

Only 0.1% of Anglo Eastern’s seafarers are over the age of 58. Most of the officers have between five to 10 years’ experience. The company also currently employs 500 cadets. "Oil majors are very particular about these statistics," Chawla explained. He also claimed that the company had not experienced any oil spills for five years.

The second differentiating factor for Anglo Eastern, Chawla believed, was the company’s management team. “We’ve all been here 20 years. That’s something unique,” he said. The shore staff includes 24 ex-masters, 57 ex-chief engineers and six naval architects. The chief executive officer, Peter Cremers, is an ex-master, and the president, Marcel Leids, is an ex-chief engineer. In total, the company has around 500 shore staff in its offices located at Hong Kong, Singapore, Glasgow, Australia and Montreal.

Evolving shipmanagement
Shipmanagement is becoming are far more respected profession in the shipping industry, Chawla believed - and more shipowners have found that the increasing regulatory burden made it too hard to manage vessels themselves. "It's easier to give vessels to a shipmanager," he said. "People say, let's outsource the difficult part. Now there is no doubt shipmanagement is a well established professional service."

After ISM, shipowners started to give their managers a lot more respect, perhaps in appreciation for how hard managing ships had become, as regulatory and oil major demands escalated. "Shipowners are looking for professional, sound service, but I think the top 10, 20 shipmanagers would qualify," Chawla thought. "The impetus for improved quality is coming entirely from regulations and the charterers, but not the owners. I don't think owners are getting more demanding."

The issue of shipmanagement fees was not very friendly. Shipowners had not yet shown willingness to pay higher fees for shipmanagers, which run their fleet at above the minimum standard. "Shipmanagement fees have not increased in the last 15 years," he claimed.

It was not hard to see that this business dynamic rewards shipmanagers who managed their fleets to the minimum standard at minimum cost - that is, close to the minimum standard as they could. This was a dangerous scenario when you consider how flawed the international regulatory system is. "Regulation helps increase the main standard, but for differentiation above the minimum standard, there has to be a market force," he explained. Chawla said that the sole market force rewarding higher quality management is that the company was more attractive to owners, and could increase its fleet size faster. There was not a great deal of economics of scale in shipmanagement (after all, there was only so many vessels one superintendent or purchasing manager can look after), but larger shipping companies were more attractive to seafarers, and this helped the manager beat one of the toughest problems shipmanagers face, which was attracting the crews.
The New ME-B Engine

The ME-B engines are the latest and most modern MAN B&W engines with low specific fuel oil consumption at all loads as well as a very low lubricating oil consumption. This together with the long time between overhauls and a very high reliability give these engines one of the lowest life cycle costs in their power range.

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**PROFILE**

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**TMSA**

Would TMSA be something of a holy grail for shipmanagement, creating a stronger market reward for shipmanagers, which aimed to go above the minimum?

Chawla wasn't so sure. "TMSA scores won't affect the chartering rates," he said. "But higher scoring ships will get better utilisation."

Anglo Eastern believed that good TMSA scores would make the management company more attractive to owners who were looking for someone to look after their vessels, and so higher scoring managers should be able to grow their fleets faster.

It was possible that the higher returns, which shipowners earned using shipmanagers with higher TMSA scores could be translated into higher management fees, but this would still take a lot of time. "It will take five years before TMSA is fully implemented, reckoned Chawla.

The hardest aspect of TMSA was promoting continuous improvement. He said; "That's my role - pushing continuous improvement. It takes a lot of energy. Ask my wife about this!"

**Software**

Anglo Eastern has a knowledge management system, which captures all the information normally completed on paper documents, so that it can be accessed in every company office and every ship, running either over the web, or from a database on the computer. This includes all the incident reports coming from the vessels, operations reports and circulars. The software was designed by ARI.

The company uses ARI's ship forms manager to gather incident forms on the ship. Seafarers can complete information about the causes of the incident, such as lack of knowledge, lack of skill, failure of memory; they can also say if the mistake was intentional/unintentional and write an analysis of what happened. It has developed its own software for root cause analysis. There is a sophisticated system with reports for internal ISM audits. "A complete record of everything is maintained," Chawla explained.

The company uses ShipServ for electronic purchasing. "We are possibly one of their biggest clients," he said. All information about vessels is available online for owners who wish to examine it, including ship inspection information and planned maintenance reports.

In its training centre in India, Anglo Eastern has a Transas shiphandling simulator, an ARI ship's engine simulator plus an LNG simulator. "We were the first company in the world to have an LNG simulator," he said. The simulator has 40 inch flat touch screen monitors, and can be used to simulate 40 different ship types. "We had to wait six months to get the correct screen," he said. "Certainly no-one else in the world has it."

There is also an online learning management system - seafarers can go into the system, and see what courses they have done and courses they want to do. This system aims to take advantage of all kinds of modern technology. Certain courses are available online, incorporating streaming video and computer games-style graphics. There are discussion forums. The company can send e-mails to all seafarers through the system. Seafarers can learn at home, and also do multiple choice tests. For questions with descriptive answers, they can compare the answers they gave with ones experts gave, on the system.

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**Greeks confound the market**

The Greeks invested an estimated $4 billion in contracting to up to 53 energy carrying ships in Asia during September, writes David Glass.

Twenty different owners placed orders, which lifted the total tanker contracts to around 275 ships. This came at a time when an average 10 tankers were being delivered to Greek owners each month.

Piraeus-based newbuilding broker, George Moundreas & Co said the real value of the orderbook was uncertain as prices for many of the confirmed deals had not been made known, as "neither the shipowner nor the shipbuilder is willing to alert others to details in a tightening market."

"All we can do is base the values on market information and this shows prices are quickly going up as owners seek earliest possible delivery," said Moundreas, adding; "the fact that what goes up must come down, has not discouraged the contracting as analysts generally talk of a good market for the next three to five years."

While Moundreas noted owners' disregard for warnings that the freight market was looking more fragile, equipment suppliers based in Greece said the pace of contracting was likely to pick up. This assumption was borne out by the fact that in the first 15 days of September, ships worth some $1.5 billion were contracted and analysts noted many more projects were under negotiation.

Among the most recent orders were Athenian Sea Carriers, which booked three 318,000 dwt VLCCs and Metrostar, which contracted two firm 318,000-tonners, with two options. All ships were ordered from South Korea's Hyundai Heavy Industries at a reported $127 mill each, with delivery 2009/2010. These two contracts involved leading players of the asset game, having in the past reaped huge profits in contract re-sales.

With shipyards now nearing capacity into 2010, many of the contracts placed by the cash-rich Greeks were likely to be carrying a premium, as all but a handful of ships will be delivered in 2008 and 2009. Earlier deliveries cost more, noted Moundreas and some of the contracts were certain to be candidates for resale at a later date.

Many of the recent orders have come from established names -- Angelopoulos, Angelicousiss, Martinos, Procopiou, Tsakos, Haji Ioannou, Vafias, Eleiston, Maranakis, Hadjipateras -- who have been renewing their fleets, through ongoing projects over the past five years.

Fifteen suezmax ships have also been ordered, with another five options.

Two LPG carriers of 84,000 cu m capacity were booked at Daewoo for Vafias-controlled StealthGas. Worth a confirmed $93 mill each, the ships were to be delivered in 2009. These marked a major diversification for Nasdaq-listed StealthGas, which currently has a fleet of some 27 LPG units, all at the smaller end of the market.

Likewise, an order by products tanker specialist Eleiston for four firm, two options, 35,000 cu m in LPG carriers at Hyundai Mipo, in South Korea was also a major diversification for this company. Worth an estimated $62 mill each, the ships were set to join the fleet, comprising 25 products tankers, in 2009/2010.

Tankerman, Basil Papachristidis, seeing "better returns in the offshore sector than those in the tanker market" ordered four pure supply vessels. In contrast, offshore specialist Gregory Callimanooulos booked his first suezmax tanker newbuildings in the shape of three firms, one option 163,000 dwt vessels, at $73 mill each, with China's New Century, for delivery 2009/2010.
Now that we’ve got our high horsepower tugs working in the Bay Area once again, Crowley’s come full circle. After all, we began our marine services business here in 1892 and it’s still home to us. So it’s only natural that we’d come back to help keep the ships that call here as well as the environment safe and sound.

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much power is needed for specific ice class, or a model test can be undertaken. Kuehnlein explained that for a vessel of up to 140 m in length, there is no real difference in the power ratio. However, for a 110,000 dwt BalticMax type tanker, the difference can be substantial between calculations and model testing. “The difference is using installed power in calculations, but delivered or required power in model testing”, he explained.

In the above mentioned cases for ice classes 1C, 1B, 1A, and 1A Super vessels are normally tested at a speed of five knots where for much power is needed for specific ice class, or a model test can be undertaken. Kuehnlein explained that for a vessel of up to 140 m in length, there is no real difference in the power ratio. However, for a 110,000 dwt BalticMax type tanker, the difference can be substantial between calculations and model testing. “The difference is using installed power in calculations, but delivered or required power in model testing”, he explained.

In the above mentioned cases for ice classes 1C, 1B, 1A, and 1A Super vessels are normally tested at a speed of five knots where for
example, the main machinery can only deliver 6MW instead of 10MW of power, due to the harder running propeller. The engine manufacturers have extended the load range. Kuehnlein said that the owners and operators of larger tankers now prefer to tank test, a point born out by Essberger's Stephan Polomsky who said that the aframax *Urals Princess* and *Urals Queen*, which Essberger was involved with the newbuilding supervision, had been model tank tested in Hamburg before being built.

Kuehnlein confirmed that podded propulsion units are of great advantage when going astern in ice, as demonstrated by the double acting tanker (DAT) designs. In ice, due to the resistance levels, a tanker sailing at five knots might burn less fuel per nautical mile than sailing at just two knots. At five knots maybe 20% to 50% more engine power will be needed, but the vessel will sail two and a half times the distance.

Hull shape is also important as ice underneath the hull can cause friction. "It is therefore important to design a hull shape that pushes the ice away from the hull", Kuehnlein explained. "You need open water to get to the propeller. The tanker should be trimmed in ballast to ensure the maximum efficiency," he continued. Also the propeller of twin screw vessels should turn outwards. The gap between the propeller and the hull must be at least as wide as the maximum thickness of the ice to be encountered. A vessel fitted with a bulbous bow will also need more power to sail through ice.

An angular bow shape should be adopted in order to limit or avoid ice crushing and to create a bow wave to push the ice away each side of the vessel. The tanker should not be built with vertical walls, where ice could build up. The stern should also be designed with a flared angle with an ice horn, or knife fitted. To go astern, the rudder should be set at 0 deg and the propeller should be constantly turning, even when slowly manoeuvring.

HSV A can undertake around two or three tests per week. For 1C to 1A Super tests, brash ice is used in the tank. The thickness of these brash ice channels is measured every two metres at 10 positions over the widths of the channel in the 70 m long tank. The towing model is pulled at five knots (full scale) with different propeller turning rates from nearly idling to well above the self propulsion point. An underwater camera is positioned to look at the propeller's action. Two tests lasting around three minutes in loaded and ballast condition each are normally undertaken.

The large ice tank is 78 m in length and 10 m in width. The depth of the main section is 2.5 m and the deep section is 5 m in depth. The ice freezing rate is two mm per hour.

### Ice Test Tank - principal particulars

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank length</td>
<td>78 m</td>
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<tr>
<td>Tank breadth</td>
<td>10 m</td>
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<tr>
<td>Tank depth</td>
<td>2.5 m</td>
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<tr>
<td>Ice freezing rate</td>
<td>Two mm/hour</td>
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<tr>
<td>Shallow Water Bottom</td>
<td>Adjustable over length and depth</td>
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<tr>
<td><strong>Towing Carriage</strong></td>
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<tr>
<td>Speed range</td>
<td>1 mm/s &lt;-&gt; 3,000 mm/s</td>
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<tr>
<td>Towing capacity</td>
<td>50 kN</td>
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<tr>
<td><strong>Transverse Carriage</strong></td>
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<tr>
<td>Static Load capacity (horizontal)</td>
<td>5 kN</td>
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<tr>
<td>Static Load capacity (vertical)</td>
<td>10 kN</td>
</tr>
<tr>
<td>Load application on vertical lever</td>
<td>up to 1.2 m</td>
</tr>
<tr>
<td>Maximum driving force</td>
<td>3 kN, at speeds up to 0.5 m/s</td>
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</tbody>
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**Sets the Standard**
Curing Shipping’s ills

Mare Forum 2006, held in Athens Greece between September 25 and 26, tried an in-depth approach to the many and diverse issues facing the global maritime industry, writes Anastasia Rammou.

Delegates and speakers represented all stakeholders. The introductory session set the scene, introduced the stakeholders, talked of the current global achievements and discussed the necessary pending actions. The UK DoT’s Brian Wadsworth linked e-Navigation with the conference’s central theme – the human factor. He analysed the objectives of e-Navigation, namely safe navigation and efficient safety services, secured shipping systems, cost-effective traffic management, logistics and operational management. Wadsworth explained the e-Navigation’s architecture: “The platform is the electronic chart, supported by real time information on navigational instructions, such as traffic lanes where they exist, virtual hazard markings, hydrological data where relevant, and vessel position and movement data. The basic positioning and timing information is naturally provided by GNSS satellites - GPS and Galileo to come”.

He said: “We need to adapt the human element, through modernised training and certification, to exploit the potential of new technology. e-Navigation is not just about hardware and software: people must, as always, be at the heart of any new navigation system”. He concluded by declaring his optimism and trust to the efforts in the IMO’s NAV and COMSAR committees, which will be identifying the core requirements for a global marine e-Navigation system (see Navigation feature on page 26).

Turning to the EU’s recently released Green Paper Ida Skard, director general of the Norwegian Ministry of Trade and Industry, described it as a ”holistic and integrated European maritime policy”. She added that Norway “wishes to co-operate closely with the EU in international bodies, such as the IMO to enhance the global quality standard of shipping through international rules and regulations”. Central to this approach, Skard said was the effort to ”stimulate entrepreneurship and innovation through scientific knowledge and a well educated and experienced workforce” and underlined this point by referring to a recent report showing that “companies in Norway in the next few years will need more than 1,000 new seafarers”, while at the same time the Norwegian maritime academies were not able to fill their capacity with students.

Alfonso Guinier, managing director European Community Shipowners’ Association, not surprisingly also gave a vote of confidence to the Green Paper, presenting it as a point for “constructive exchange of views” between all parties. Guinier illustrated the progressively lower costs of transporting goods by sea and further supported the Green Paper’s proactive approach towards the economic, social and environmental balance necessary for the industry’s sustainable development.

Clay Maitland, managing partner, IRI/ Marshall Islands Registry, highlighted the quality endorsement role set out in the EU Green Paper: “What the client/shipowner wants today is flag state that can solve problems. These problems are clustered, largely, in the areas of environmental protection; safety; the efficient provision of services; crew certification; political acceptability; and that hard-to-define substance called ‘quality’.

Green Paper,” he said. RINA’s CEO Ugo Salerno addressed the question of sustainable regulation, offering his insight regarding the idea of systemic regulation: balanced self-regulation emerging from a compliance culture, which provides the genuine incentives for corporate social responsibility. Salerno concluded by describing a ‘parthenon of sustainable regulation’, where the pillars holding it up are called ‘self-regulation’, ‘incentives’ and ‘corporate social responsibility’, while its base is called ‘goal-based standard’.
The third session addressed the issues of safety, environment and the relevant changing attitudes, followed by a discussion on the theme, “Is shipping being left behind in the race for green solutions?”

Harilaos Psaraftis, professor, National Technical University of Athens and former CEO of Piraeus Port Authority, referred to the need for proactive attitude and proactive regulation as the key drivers to a greener shipping industry. He commented that regulation should be placed in place before the catastrophic event and formulated properly to prevent the catastrophic event, instead of being ad hoc adopted “in the aftermath of catastrophic events”.

Proactive safety regulations need to be integrated with the formal safety assistance (FSA) and the goal-based standards (GBS). FSA was defined by the IMO as “a rational and systematic process for assessing the risk related to maritime safety and the protection of the marine environment and for evaluating the costs and benefits of IMO’s options for reducing these risks”.

GBS focuses more on the construction of the ship, the objective being to introduce a system of standards to measure against the safety of a ship during its design, construction, and operation. These standards “should be broad, overarching goals against which ship safety should be verified”, while they are not intended to “set prescriptive requirements or to give specific solutions”, Psaraftis said.

He continued by referring to the GBS’s safety level approach (SLA) debate. He asked how and when can the FSA and GBS be linked and integrated? Before this integration, there was a need to address certain deficiencies in the SLA, and specifically the “individual risk acceptance criteria” and its one-dimensional existing risk index. Psaraftis underlined that there had been no FSA for environmental risk, instead there were only assumptions, therefore significant effort is needed to “develop environmental risk assessment criteria”. Psaraftis concluded by offering practical suggestions for further steps towards this direction, including full discussions at the IMO by relevant correspondence groups and the preparation for onward discussion at MSC 82, Istanbul in November-December 2006. His overall concept strategically linked “shipping safety” with “environmental safety”.

Michael Cabibbo, managing director, Worldwide Ecological Shipping & Transport [WEST], presented what he considered to be an innovative, practicable and environmentally-efficient technology solution. WEST recently patented a propulsion system that enables merchant ships to be fuelled by treated municipal and industrial wastes, biomass or other types of refuse derived fuel (RDF), meeting the UNI 9903 (RDF) requirements. The energy produced from RDF combustion can be used for the ship’s propulsion, as well as all of its electrical and heating requirements, while reducing the air emissions by up to 98% when compared to a traditional maritime propulsion system. In addition, WEST’s system was claimed to give substantial economic benefits to ship owner/operators and also provide a hedge against the constant fluctuation in bunker prices.

This system is fully compliant with all the latest European directives regarding the use of renewable energy sources and in particular Directive 2003/30/Ce - 'Promoting the use of bio-fuels and other renewable fuels for transport'. Cabibbo covered all the aspects of this environmental technology - the logistics and environmental issues, the implications for RDF production plants and waste treatment plants, the ship design considerations, and RDF availability. When referring to the economic competency of his technology, Cabibbo stated that the increased costs associated with WEST’s patented system are quickly recovered through:

(a) The elimination of the majority of the fossil fuel costs
(b) The profits derived from acceptance of the RDF (tipping fee).
(c) The possibility of increasing the cruising speed of the vessel.

As a further illustration, Cabibbo presented the net present value of the after tax cash flow benefits. In concluding, Cabibbo stated that improving the environmental conditions of coastal ecosystems means reducing the emissions from ships. "The WEST propulsion system allows for a reduction in air pollutants by a factor of 10, while providing the owner/operator of the ship with a new and significant revenue stream from the tipping fees received from use of RDF", he claimed.

**Recycling**

DNV’s Hanna Lee Behrens presented the class society’s proposal for ship recycling through the culture of corporate social responsibility (CSR).

After briefly presenting DNV’s ship recycling practices regarding health, safety and environmental issues, Behrens stressed the class society’s commitment to make the maritime industry environmentally sound by striving to achieve efficient regulatory framework, examining cost-effective measures, and supporting the industry to reach environmental compliance.

The fourth session, which pulled in the most delegates and proved to be the most interesting session during the conference’s first day, endeavoured to give a holistic analysis of the human factor challenges.

A discussion between the speakers and audience followed the theme: “How can the decline in the number of Europeans entering certain maritime professions be reversed and the safety and attractiveness of jobs ensured?”

Manning shortage

Roberto Giorgi, CEO of V Ships, started his address with a startling question: “Where will tomorrow’s crews come from?” Recruitment is the single biggest issue facing the maritime industry, an area needing significant investment, while the human factor is the catalyst to a competitive advantage. Giorgi presented a combination of adverse elements – a global shortage of suitably qualified officers in conjunction with growth in the world fleet, increasing industry regulation, plus wages’ inflation caused by competition.

He referred to a new approach to increase the supply of quality seafarers in that crew must be viewed by shipowners as ‘customers’. There should also be long-term strategy implemented for discovering and developing talent. Key factors to this new approach are ‘training’ and ‘retention’. According to Giorgi, as China appears already unable to meet current demands, the next crews will probably come from the new and aspiring EU nations, as well as from Russia and India.

“Recruitment is the single biggest issue facing the maritime industry, an area needing significant investment, while the human factor is the catalyst to a competitive advantage.”
GREEK SHIPPING SUMMIT REPORT

In his conclusion, Giorgi underlined the importance of investment in quality crew, as well as the importance of the crews' need to feel respect, stability and involvement in the company they work for.

George Chalos, partner, Chalos, O'Connor & Duffy, LLP, addressed the pertinent subject of seafarer criminalisation, which is an emerging and growing factor discouraging people from joining maritime professions. After explaining certain legal terms, such as 'strict liability' (an individual can be found criminally liable without having had any criminal intent) and 'corporate liability' (a corporation may have direct criminal liability for the acts of its directors, and officers; a corporate officer/director may be found criminally liable just because of his/her position of responsibility), Chalos presented the criminalisation threat for commercial vessels in US ports and waters.

Violations of MARPOL and the Act to Prevent Pollution from Ships (APPS) by any commercial vessel, including vessels operating under the authority of a country other than the US, when these are operating in US waters, or while at a port or terminal under the jurisdiction of the US, may lead to investigation by the US Coast Guard, arrest of the crew and the detainment of the vessel, prosecution against the crew, owners and managers (corporate and/or individuals) and criminal charges. From 'obstruction of justice' to 'false statement' and 'conspiracy', these charges can be overwhelming for innocent crew members.

Intimidating

US Coast Guard officers with their intimidating style are inspecting vessels using checklists of 'red flags' (anything from a freshly painted flange to whistle blowers seeking monetary reward). "Investigators can and will seize documents and records; contact local US Attorney's Office to obtain grand jury subpoenas and/or arrest warrants; arrest and/or detain individuals who may witnesses or are suspected of committing a crime; remove witnesses and/or suspects from vessel and detain them for extended periods of time", Chalos warned. He concluded his talk by providing a key list of the crew members' rights in the US and of the ways to avoid and respond to a criminal investigation.

Jannis Platsidakis, ceo Anangel Shipping, delivered arguments supporting the notion that shipping is a personnel-intensive rather than capital-intensive industry. A shipowner, as opposed to a plant owner, will have to rely on his/her vessel's crew, in their competence and numerical capacity, to navigate, maintain and manage the vessel in compliance with the company's objectives and policy, to meet the vessel's chartering commitments and to implement flag, environmental and international laws and regulations.

Platsidakis said that he disagreed with studies that point to a world shortage of seamen, as such a shortage, if actual, would have resulted in ships being laid-up. Instead, he associated the growth of the industry with the increasing evidence required to vouch for crews' competence and businesses' commitment to provide continuous training and performance monitoring. He said that his company's commitment was expressed primarily through flying the Greek flag on its vessels. This way, the company could illustrate its reliability, through a flag of a state with substance, to which every flag state employee can turn to seek support if they feel they are treated unfairly by the company.

As an extension to the Greek flag, the group employs Greek officers who they can develop within the company by rotating them between different roles. In addition, he said that the company employs a significant number of cadets, trains them on board and takes on the best graduates.

The group maintains a certified training department providing constant and rotating seminars for its crew. Further, the group has established its own recruiting agency in the Philippines in order to retain optimal management of ratings.

Ken McLean, director and chief executive, Bahamas Maritime Authority, further endorsed the importance of the flag. During his long career at sea, McLean said that he often found himself to be "an amateur engineer and a professional psychologist". The Bahamas Maritime Authority is currently focusing its attention on a strategic plan for the five year period 2006-2011, which emphasises the chain of responsibility for enhancing maritime safety and requires the human element to be considered at all times.

The chain of responsibility is - IMO => Flag State => Port State => Coastal States => Shippers => Classification Societies => NGOs => Crew. If one link fails, the whole chain fails, often with terrible consequences. Often crew are blamed for incidents, under the notion of 'human factors'; however, a closer look always reveals erroneous 'human factors' at the level of designers and managers.

IMO's strategy encourages all stakeholders to identify, correlate and evaluate the factors, including human interaction on board ships that influence safety and security culture.

The organisation's challenge is (a) to place emphasis on the contribution of the human element to safer shipping and (b) to improve measures aimed at enhancing human performance in the maritime industry.

"Human beings never will be infallible. Human minds will wander; frustrations have an adverse impact on behaviour; uncomfortable working conditions affect physical co-ordination, and fatigue takes its toll and hampers both judgement and physical responses. "Lack of knowledge, familiarity with equipment and professional skills also tend to be reflected by rising accident rates. Thoughts of home, the implications of leaving behind family and loved ones follows the seafarers to sea and ashore (Thomas & Bailey, 2006) making safety on the job everyone's job", McLean said.

The discussion that followed, under the chairmanship of Eurasia's Rajaish Bajparee, revealed many catastrophic events caused by the mere lack of necessary rest. The exchange revealed a close link between the increasing demands on the human side and the diminishing number..."
of young people wanting to become seafarers. One optimistic observation stood out. This was made by Jean Richards, director Quantum Shipping Services who referred to a discussion she had with McLean 25 years ago, when they were both worried about the diminishing number of young people joining shipping. The fact that after 25 years the same issue is on the agenda demonstrates that the shipping industry always employs those people who really love it and will strive to achieve progress within it.

During a recess discussion, Bajpae offered up his views regarding human factor in shipping, a matter in which he is an acknowledged expert. "As shipping industry changes, public perceptions change too: now there is 'zero-error, zero-tolerance' attitude", he explained. Human factor errors, which can be avoided are not being forgiven anymore. On the other hand, just-in-time processes has led to the continuing build up of a larger fleet, thus driving recruitment to outsiders.

Mismatch
This huge orderbook has created a mismatch of resources. There are about 5,000 vessels to be delivered in the following months, but are there 5,000 masters ready to command these vessels? Further, Bajpae referred to the tri-fold approach for the retention of quality seafarers, considering 'retention' as more important.

A substantial investment made on an employee comes to nothing when they decide to change jobs for a small increase in his or her salary. This mark-up might have seemed insignificant if the employee felt trusted, valued and dignified by his/her existing employer. Also, continuous and effective training is absolutely essential for efficiency, safety and compliance in shipping.

Turning to the finance sector, under the theme of 'Buy, Sell or Hold, what will you do?',

Bote de Vries, head of investment management and agent for Navigation Finance Corporation (NFC) and Deucalion Aviation Funds, outlined the advantages of remaining a private company. NFC has been active since 1999 and is a joint venture between DVB and Northern Navigation International (NNI). Its objectives are to identify, structure and execute investments in all shipping and offshore sectors. Its products include private equity, preferred equity, sale and leaseback, straightforward equity, mezzanine debt and other financial solutions.

De Vries outlined why in his opinion shipping companies should remain private:
(a) For at least a decade shipping stocks were priced below net asset value on almost every stock exchange in the world.
(b) Up to 2003, more public companies went private than private companies went public in shipping.
(c) US window is short and brings the memories about the high yield bond issues.
(d) The favourite public price per earnings (P/E) ratios can give a wrong picture in shipping, as it presents old vessel earnings the same as young vessels, although they will need replacement (or other costly refurbishment) soon.
He referred to the largest disadvantage of going public - investors, analysts and the rest of the world want companies to invest and grow if the business is going well and to divest and control costs if the business is going badly.
Also, owners lose the control, while analysts virtually run the company. The capital required could become available at better pricing than by going public, while the risk for a big company is the multiple of a smaller company's risk and only the investments banks can be the

considerably. For the shipowner, the decision to go public depends on how the main objective, which is that the market value exceeds the net asset value, can be reached. Whereas, for the investor, the decision to buy shares in shipping depends on the main objective - the expected return.

Bartnes used Frontline as an example of both parties having succeeded. He said there were two ways to calculate Frontline's value - the net asset valuation (NAV) and the discounted cash flows (DCF). It is obvious that the NAV looks at the historical cost, which is important for a capital-sensitive industry such as shipping, while DCF assesses the future of shipping company's returns. There is a market expectation derived from DCF, which may not correspond to shipowners capital decisions. There is a positive relationship between shipping returns and the key figures. However, there has been no co-ordination between the finance and the shipping markets until a few years ago.

Public or private?
There was a vivid discussion following the speeches. These were structured as a game of Monopoly. Participants were asked by the session's chairman Jon Guy whether they would access the capital market, or remain private and which of the two options would they invest their funds in.
Overall, there are two approaches to financing shipping. There are the brave pioneers who comprehend the need to assess the capital market. Fortunately, there are a lot of shipowners who know their business so intuitively and so deeply that no capital market could deprive them the control of doing what they know best.
These debates are not uncommon in finance. What is unique in shipping is the intensity of these two contrasting attitudes - private or public finance.
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Small coastal tanker series features full redundancy

On view in London earlier this month was the first in the series, the 4,420 dwt Speciality. She was delivered last May from the Wuhan yard of Qinshan and bought a cargo of vegetable oil loaded in Malaysia to northern Europe.

The second ship in the series, Seniority had reached Singapore on her way to Europe as TANKEROperator went to press. The third and fourth vessels, Superiorty and Supremity, will be delivered by the end of the first quarter of next year.

Speciality was built according to Lloyd's Register +100A1 Double Hull Oil Tanker, ESP, LI, EP(V) +LMC, UMS, PSMR, CCS, ICC ShipRight (SERS, SCM) SBT to a twin skeg design.

Upon TANKEROperator's visit to the ship it quickly became evident that a lot of thought had been put into the design at the conceptual stage, which was developed by Everard in-house. However, the actual design and construction was as a result of extensive collaboration between Everard, Norwegian naval architects Skipskonsulent, the UK's Maritime and Coastguard Agency (MCA), LR and Qinshan Shipyard, Everard said.

Failure Mode Effect Analysis (FMEA) techniques were applied throughout the design and construction process to assess the consequence of potential failure and to identify where improvements were required. The fundamental design principle applied to the quartet was that there must be no single point of failure, which could lead to a hazardous situation.

Speciality and her sisters have been built with full redundancy in mind. They are twin screw, twin rudder, diesel-electric powered vessels of around 4,400 dwt on a maximum draft of 5.9 m. The total cargo capacity in the six coated tanks is 4,500 cu m. In areas where the depth is restricted the tankers can achieve their design deadweight tonnage of 3,750 on a draft of 5.4 m.

The unconventional cargo tank layout means that there are no port and starboard tanks arranged each side of a centreline as in conventional tankers, but a full scantling deck trunk running the full length from the forecastle to the accommodation. This provides the longitudinal strengthening needed, usually afforded by the centreline. This trunk houses stainless steel piping, cables, valves and instrumentation to be located in a fully protected environment, which also houses a fixed gas detection system and a water mist fire extinguishing system. In total there are 225 remote controlled valves and thus 450 hydraulic lines.

Each vessel has six cargo tanks of varying sizes, which allows greater flexibility when carrying multi-grade cargoes. Six grades can be carried in total segregation. Each tank is fitted with a Marflex deepwell cargo pump, rated at up to 375 cu m per hour and is fully coated with International Paints Interline 903 phenolic epoxy. The stripping valves can be controlled from the bridge, while one person is usually deployed on deck during cargo operations.

Heated cargoes can be carried and each tank is fitted with Bloksma shell and tube heat exchangers using hot water as the heating medium. Tank cleaning is achieved using Dasic Oribitor tank washing machines and a hot water wash (to 85 deg C) can be used if necessary.

When considering the risk during cargo operations on a berth, Everard took into consideration that the vast majority of small to medium oil spills took place during loading and discharge operations and that human error contributed to most of these pollution incidents. Consequently a comprehensive centralised cargo control and monitoring system was developed by Damcos Marine Systems using Saab Rosemount tank radars supplemented by high level

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Principal particulars

<table>
<thead>
<tr>
<th>Length, overall</th>
<th>95.1 m</th>
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<tr>
<td>Depth</td>
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<td>Speed, maximum</td>
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Tank capacities

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<tr>
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<td>657 cu m</td>
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<td>1,013 cu m</td>
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<td>5</td>
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<td>757 cu m</td>
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<tr>
<td>Total</td>
<td>4,510 cu m</td>
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<tr>
<td>Slop tank</td>
<td>42 cu m</td>
</tr>
<tr>
<td>Max loading rates</td>
<td>3,000 cu m/hr</td>
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Speciality – A special tanker
TECHNOLOGY - SHIP DESCRIPTION

alarms and redundant tank empty sensors in the pump wells. Everard claimed that this system provided huge benefits to the operator by way of an instant overview of the status of the entire cargo, ballast, stripping and tank venting system.

Specifically for this class of vessel, Damcos and Everard developed a detailed and intelligent cargo planning module, which verifies the viability and integrity of an entire cargo operation before it can be executed. This includes confirming that the two valve segregation between different grades is in place; the manifold valves are only open on the correct side of the vessel, product loaded into a tank, or through pipework, dedicated elsewhere within that operation to a different grade of cargo. Having validated the plan, it is then monitored by this system throughout the cargo handling operation. Any deviation immediately prompts an alarm.

Another innovative design, pointed out by managing director William Everard, is the installation of four Rauma Brattvaag mooring winches both fore and aft, which can be automatically controlled from the bridge. Cameras are placed on the bow and stern enabling the bridge team to monitor operations. At some ports, such as Immingham, there is a very high rise and fall tide, which can vary by as much as six metres.

Moving on to the navigation equipment, this is housed in an almost 360 deg visibility bridge area. The centrepiece is a SAM Electronics NACOS IV integrated bridge system (IBS), which includes a dual redundant ECDIS, radar, ARPA, AIS and multi-function adaptive autopilot. All the other navigational information and monitoring systems are integrated into the NACOS, allowing the display of all the relevant data on any of the five inter-switchable displays within the wheelhouse.

As a consequence of the redundant ECDIS installation, the Speciality class is allowed to operate without paper charts. Furthermore, by carrying a high calibre gyrocompass and a GPS compass, the vessels do not have to carry magnetic compasses. Everard claimed that these were the first UK flag ships not to be fitted with a compass since 1894. The wheelhouse also contains the machinery control centre, the cargo control and monitoring station, the communications hub and the ships’ office. A PC-based simulator is also available for training purposes at the back of the bridge.

Speciality’s two entirely independent machinery spaces are separated by a fire resistantwatertight bulkhead. Machinery redundancy helps to ensure that the vessel was still able to sail at 10 knots using one machinery compartment.

Both machinery spaces house three MAN/Leroy Somer diesel generator sets set in separate soundproofed enclosures. They can each produce a maximum of 486 kW. This package has been provided by Lindenberg Anlagen. Equipment redundancy in the machinery spaces allow the vessels to operate without an emergency fire pump, or an

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Everard family still very much in control

Last year, FT Everard celebrated its 125th anniversary. It was founded in 1880 by Frederick Thomas Everard who was building, repairing and trading the traditional Thames sailing barges from his base at Greenhithe, Kent.

Down the years, the company has been controlled by the same family. Frederick was succeeded by his four children - Frederick, Alfred, William and Ethel - in 1929. William's son and daughter - Frederick and Ethel - took over in 1964.

The fourth generation gradually took control and assumed full control in 1988 on the death of their father Frederick and the retirement of Aunt Ethel.

Today, Frederick Michael Everard is chairman, William Derek Everard is managing director, while sister Rosemary Ann Shotton is a director of the company.

A few years ago, Everard set its stall out to become the market leader for operational, standards, technological innovation and environmental performance in the northwest European coastal clean petroleum products trades, having ditched its 'yellow peril' image somewhat unfairly levelled at some of the company's drybulk coastal fleet. For many years Everard had owned and managed for third party clients, a variety of coastal drycargo vessels, as well as a considerable tanker fleet, until the company decided to concentrate purely on tankers.

Everard's innovative period started with the double hull Ability class tankers delivered in 1979 and with the later Asperity class dating from 1997. These were fitted with state-of-the-art cargo control and monitoring systems and emergency

---

A full scantling trunk runs the length of the vessel
allowing access to UK free-to-air TV and radio stations. There are 11 cabins provided on board. A large messroom is divided into a lounge and eating area with a kitchen and store room located opposite. Large food storage space is usually not required as the vessels call at ports once every three or four days.

All the accommodation space is carpeted and nobody is allowed in unless specifically authorised. A changing room has been fitted for footwear.

An emergency generator. Power availability is provided by a highly sophisticated power management system developed by Imtech Marine & Offshore.

Both the Damcos and Imtech automation systems 'talk' to one another and so the vessels work to a single radio clock, otherwise the integrated machinery systems would not work together. The electronics were installed by Ships Electrical Services (SES), an Everard subsidiary.

The generators provide the power for the low voltage 690 V diesel-electric propulsion system. Each side of the system comprises one 900 kW variable speed electric motor driving a fixed pitch propeller through a single stage reduction gear.

Each vessel is capable of a maximum speed of 13 knots, but in service they will normally operate at 11.5 knots, consuming about six tonnes of mgo per day. William Everard explained that 11.5 knots service speed is attainable on three engines, but that it is more economical to operate on four at 330 kW, giving a lower power ratio.

There are five modes of operation with the six generators - alongside mode, manoeuvring with four engines, manoeuvring in heavy weather with five engines, passage mode and sprint mode. The latter adds around 1.5 tonnes extra fuel, but is sometimes used to get to ports where a tidal window operates, such as Ipswich. Everard explained that to miss a tide could mean missing the next cargo.

Emissions and energy consumption are minimised due to the highly efficient hull form, selection of low sulphur fuel, load optimised high speed diesel engines and waste heat recovery systems, claimed Everard. The company said that these vessels can achieve reductions of 50% in NOx, 90% in SOx and 30% in CO2, compared with other similar vessels.

Noise has also been taken into consideration as the vessels are sometimes required to call at wharves near built up areas. As the vessels solely trade within MARPOL designated areas, the company operates a zero tolerance policy regarding discharge of oil mixtures at sea. They are therefore fitted with large capacity storage tanks for waste oils generated from the machinery, as well as from the cargo operations. Consequently the vessels are exempt from carrying an oily water separator and oil discharge monitoring equipment.

The ships' office can be used by the deck rating as a rest room and houses an Omicron gas sampling system connected to the bow thruster room and paint room. The level of oxygen is also measured for extra safety.

Everard has also taken due care of seafarer comforts. Each of the eight crew members has his or her own cabin fitted with modular en-suite facilities and satellite TV with independent decoders allowing access to UK free-to-air TV and radio stations. There are 11 cabins provided on board. A large messroom is divided into a lounge and eating area with a kitchen and store room located opposite. Large food storage space is usually not required as the vessels call at ports once every three or four days.

All the accommodation space is carpeted and nobody is allowed in unless specifically authorised. A changing room has been fitted for footwear.
International lives up to its name

Silicone paint applied to the undersides of large vessels travelling at speeds of plus 15 knots can save as much as 6% in fuel consumption, claimed International Marine Coatings.

Although tested on four fast Hapag-Lloyd containerships using International’s Intersleek, a coatings technology that does not use biocides to control fouling, the savings on fuel consumption can be made by coating the underside of any deepsea, high activity scheduled ships, claimed the coatings manufacturer.

Intersleek provides a slippery, low friction surface onto which fouling organisms have difficulty settling. International claimed that any that do, normally settle weakly and can be removed easily by simple wiping or washing, or by the vessel moving through the water at speed.

Ship operators using Intersleek have reported important economic and environmental benefits, including increased vessel speed, reduced fuel consumption, reduced emissions, no leaching of biocides into the sea and reduced wash water treatment costs at drydock.

Elsewhere, International has experienced some success coating ice class tankers. Two of the so called ‘ICE’ class aframax vessels operated by StenaBulk in a collaborative venture between Stena and Russian interests, including Sovcomflot, were coated with Intershield 163 Inerta 160. The first vessel Stena Antarctica had her vertical sides coated while at Dubai Drydocks in June, while the second ship Stena Atlantica was scheduled for application in October.

International said that many more in the ‘ICE’ pool would follow. Intershield 163 Inerta 160 was specifically designed to be applied on vessels operating in ice conditions. It is a high performance abrasion resistant coating, which includes the following features:

- Smooth surface assists ice slip.
- Resists ice adhesion to the coatings surface.
- Low frictional resistance controls fuel costs and improves operating efficiency.
- Abrasion resistant - controls mechanical damage and hull roughness, saving on future maintenance and repair costs.
- Up to 2.5 times the impact and erosion resistance of standard epoxies.
- Designed for operation in temperatures down to - 50 °C.
- First class society recognised abrasion resistant ice coating.
- Good mechanical properties: flexibility under bending stress, extension and compression.
- Good cohesive strength.
- Allows reduction in steel thickness at the ice belt leading to reduced overall vessel weight and improved fuel efficiency.
- Thirty year, plus or minus 700 proven track record.
- Low volatile organic compounds (40g/ltr EPA Method #24, 30g/kg SED).

Last July, the first vessel in Romania to be applied with International Paint products was coated on the main deck, superstructure, water ballast tanks, technical tanks, cofferdams and underwater areas.

The 41,000 dwt chemical tanker Histria Amber was launched at the Santierul Naval Constantza yard. She is the first of two complete vessels to be supplied by International.

International has also been very active in Dubai Drydocks recently. Applications include the 137,354 cu m LNGC Al Khor operated by NYK on long term charter to QatarGas. Back in November 2001, International Paint attended the gas carrier in Singapore and coated the complete underwater area of over 15,000 sq m, which was blasted to SA 2.5 standard. Intershield 300 was applied followed by an Intersleek foul release system.

Two years later, the LNGC was drydocked in Dubai under survey requirements where the Intersleek system was found to be in good condition. In September this year, the vessel undertook a scheduled drydocking where the Intersleek was still found to be in excellent condition.

The total touch up repair was less than 1% and most of that was said to be down to mechanical damage at or around the fender areas. Following the touch up repairs, one full coat of Intersleek was applied, while the topsides were converted from Interthane 990 (polyurethane) to Interfine 979 (polysiloxane). Al Khor has since returned to service and is not due for another drydocking for five years.

Last August, the VLCC Watban was also drydocked at Dubai. The National Shipping Corporation of Saudi Arabia (NSCSA) owned, Mideast managed tanker had her existing coating removed on the underwater hull. An area of 29,000 sq m was blasted followed by an application of Intershield 300 and Intersleek on the vertical sides and a five year Interswift 655 scheme was applied to the flat bottom area.

The topsides were converted from Interthane 990 polyurethane to Interfine 979 polysiloxane for extended gloss and colour retention.

Watban was the fourth NSCSA VLCC converted this year, following the Ramlah, Safaniyah and Ghanawar. The last of the five sisters, Hawtah, is scheduled for drydocking in November.

Finally, the Iranian VLCCs Iran Noor and Iran Noah managed by continuing on page 24
Long life

Intershield® 300

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TECHNOLOGY - HULL COATINGS

Optimising hull performance

Around two-thirds of the world's shipping above 10,000 dwt, is burning more fuel than is necessary to reach its destination on time. Half these vessels could improve their performance without affecting commercial operations, by using routine cleaning techniques.

The other half requires comprehensive hull treatment in drydock before performance can return to a level akin to the original sea trials. This was the view expressed by Torben Munk, president of Propulsion Dynamics, when he spoke at the SMM conference held in Hamburg on 28th September.

As Munk implied in his paper, The Effect of Drydock Treatment and Coating Selection on Hull Efficiency, this situation did not arise from either unawareness or complacency about the problem. He said that owners were spending a lot of money to mitigate hull degradation, ‘...the total costs of all shipowners’ anti-fouling precautions are of the order of $1.5 billion per year, or approximately 5% of marine fuel oil costs.’

The main methods used to combat added resistance to the ship's hull and propeller were, he said, the treatment of the hull in drydock, the selection of a suitable coating applied to the underside of the hull at regular intervals, and in-water brushing of the hull and polishing the propeller. This raised in Munk's mind the question of which coating to use, and when to undertake the maintenance procedures. The tools available to evaluate this to a precise degree...
Innovation means control

Danish coatings manufacturer Hempel recently launched two new innovative solutions offering complete fouling control

What is claimed to be a new dimension in surface contact is a silicone-based biocide-free fouling release coating called Hempasil. This system has a non-stick surface with three important properties - exceptionally low surface tension, flexibility and smoothness. It is extremely hard for fouling organisms to cling to a Hempasil treated surface, claimed the manufacturer.

The flexibility and low surface tension of the top coat means that organisms are secured from the hull as the vessel sails - so fouling that settles when the vessel is idle will not last. And the coating's smoothness cuts down on drag, reducing fuel costs by up to 2% compared with conventional antifouling solutions.

Ships with frequent ports of call and having fender contacts while alongside can benefit from the high-abrasive resistance of the entire system, Hempel said.

Real challenge

For some non-stick fouling release coatings, sticking to an anti-corrosive coating on a hull can be a major problem. To ensure that Hempasil adhered well enough to anti-corrosive coatings on hulls, Hempel developed and patented a new tie coat called Nexus.

Nexus 'ties' the silicone coating to the inner epoxy-based anti-corrosive system. Utilising adhesion promoters and advanced hybrid chemistry (the combination of epoxy and silicone technology), Nexus is said to achieve extra-firm chemical bonding between the different coats and exceptional mechanical strength.

Hempel claimed that this system is extremely efficient to apply and has already been used in 100 full ship applications, covering more than 200,000 sq. m.

Both the Hempasil top coat and the Nexus tie coat are ecologically sustainable and have a very acceptable VOC content. There is no leaching of biocides into the marine environment, and because the Hempasil system is 70% solids, emission into the atmosphere is minimised.

Dry docking intervals

Hempasil is a key component in the first coating system specifically designed for vessels certified for docking intervals of up to 10 years.

The coating comes with a 10-year guarantee making it the key component in the coating system of vessels with long docking intervals. Using Hempasil, the container ship APL Jeddah, owned by APL has secured certification from DNV to sail 10 years between drydockings.

Hempel's own studies show that the reduced drag from Hempasil can produce substantial fuel savings compared with other antifoulings, especially for vessels operating at a higher speed.

The Danish company also has a high-performance antifouling that is both self-polishing and self-smoothing, Globic NCT. The antifouling helps combats both marine fouling and the effects of fouling has on fuel consumption.

Hempel said that nano-capules technology provides such precise control of polishing rates that it is possible to create an economical top-performance product that can be designed for specific needs and conditions. This binder technology is claimed to have several advantages:

- **lower paint consumption** - a 15% reduction in dry film thickness gives a marked reduction in the cost of fouling protection per service month.
- **lower application costs** - fewer coats mean less time spent in drydock.
- **fuel savings up to 1%** - Globic NCT has demonstrated the same high level of hydrodynamic smoothness as the best of the TBT-based antifoulings
- **lower purchasing costs** - the coating has been thoroughly tested on top of all existing antifouling technologies. Doing away with the tiecoat saves on the purchase cost, in addition to the time and expenditure involved in one complete coating application.
- **faster redelivery** - thanks to quicker drying and shorter recoating intervals.
- **optimised antifouling performance** - a drydock interval of up to 60 months is possible even under the most aggressive fouling conditions.
- **superior mechanical properties** - achieved by a strong binder and the use of reinforcing microfibres*.

Globic NCT uses nano-sized acrylate capsules in the binder system to maintain the balance between the self-polishing rate and the leach rate. The nano-capsules' highly reactive acrylate polymer core is primarily responsible for the self-polishing effect. Around the core is a shell of hydrophobic acrylate, essential for controlling the rate at which sea water penetrates.

Working in collaboration with research partners in Japan, Hempel has managed to fine-tune the rate at which the acrylate core reacts with sea water - and can now formulate antifouling coatings with polishing rates designed for specific purposes and conditions.

*Hempel has produced more than 35 mill litres of antifoulings with the patented microfibres.
ECDIS performance standards edge closer

In July, at the IMO's sub-committee on safety of navigation (NAV), draft revised performance standards for ECDIS were finalised for adoption by the Maritime Safety Committee (MSC) 82nd meeting due to take place in November/December this year.

According to the IMO, the aim behind the revision is to ensure the operational reliability of the equipment, taking into account the technological progress and experience gained. It has been proposed that the revised performance standards would apply on all ECDIS installed after 1st January, 2009. The draft proposals are more detailed than the current version and include references to newer equipment, such as AIS.

A safety of navigation circular has since been issued entitled, Additional Guidance on Chart Datums and the Accuracy of Positions on Charts. This is meant to give guidance on methods of detection of datum inconsistencies in electronic charts, such as by using radar overlay in advanced ECDIS models.

At the meeting, the sub-committee considered the results of a formal safety assessment (FSA) study by Japan, which indicated that the mandatory installation of ECDIS was justified on cost grounds, providing the vessels sailed in areas where suitable scaled ENC's were available.

The study concluded that, when considering a mandatory carriage requirement for ECDIS, the implementation date should be harmonised with the date on which the ENC's become available for such areas and, in addition, the mandatory application of ECDIS on existing vessels and small ships should be carefully examined.

Although there was considerable support for the FSA, some of the delegates thought that this did not mean that 100% ENC coverage would be necessary or achievable. The target completion date for the development of mandatory carriage requirements for ECDIS is 2008. Further submissions were requested for the next session.

Other concerns were raised by the NAV, following the MSC's 81st meeting held in May, at which the sub-committee was asked to look at an item labelled 'Development of an e-navigation strategy' as a matter of high priority. Also involved were the radiocommunications and search and rescue sub-committees (COMSAR). NAV is acting as the co-ordinator.

NAV said it fully supported the concept of e-navigation with the IMO taking the lead, but said it would be prudent to invite other organisations, such as the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) and the International Hydrographic Organisation (IHO) to participate.

As a result, a correspondence group on e-navigation was established to make recommendations on the following:

- The definition and scope of the concept of e-navigation in terms of its purpose, components and limitations with the aim of producing a system architecture.
- The identification of the key issues and priorities that will have to be addressed in a strategic vision and a policy framework on e-navigation.
- The identification of both benefits and obstacles that may arise in the further development of the vision and framework.
- The identification of the roles of the IMO, the member states, other bodies and industry.
- The formulation of a related work programme, including an outline migration plan (to give timescales of the phased roll-out of the proposed system) and the roles of NAV and COMSAR, as well as from other parties concerned.

Other items on the agenda included the recommendation on new and amended routing systems, including traffic separation zones, the standardisation of vessels reporting systems into extensible markup language (EXL) format. This was forwarded to the COMSAR committee.

Also discussed were draft performance standards for shipboard GALILEO receiver equipment, which were approved for adoption at MSC 82 (see page 29). The committee noted that these standards were meant for standalone GALILEO receiver equipment and that there might be a future need for performance standards for combined GALILEO/Global Navigation Satellite Systems (GNSS) receivers.

Progress was also made on the draft revised performance standards for integrated navigation systems (INS). A correspondence group was re-established to finalise the drafts and also to develop revised performance standards for integrated bridge systems (IBS) to include an alert management module and bridge resource management guidelines.
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Simplicity in a complex world

Revolutionise navigation...

Charts You Can Trust
Navigation beyond the stars

On an average day, a trawl through the pages of the auction website eBay will reveal more than 150 items under the search, 'sextant'. Names such as Dolland, Kelvin & Hughes, Henry Barrow, Jesse Ramsden, and Limbach, through to the more modern Plath Company of Germany, are on offer from one dollar to $500, writes Brian Warshaw.

Refinements may have been added to the sextant through the years; but basically, it remained the same design as that put forward by John Hadley in 1731. Instruments made with loving care by skilful engineers, housed in mahogany or oak boxes, some with engraved nameplates to their former owners, have become ornaments and objects of beauty to be proud of.

Unlike the dodo, the sextant is not quite dead; but it is no longer the first choice of the professional maritime navigator. Celestial navigation will remain a passion for an officer on the bridge with a quiet moment to spare, or for the amateur yachtsman out for a pleasure cruise. Nevertheless, the sextant has been effectively replaced by the satellite for all commercial and military navigation.

Since 1945, development work has been ongoing to provide an effective radionavigation system, and in 1957 the US Navy established a series of transmitters in the northeastern Atlantic and Mediterranean, naming the system LORAN-C. In the 1960s, LORAN-C was used more by the aviation industry than the maritime industry, especially during the Vietnam War, when a chain of stations was established for the use of USAF aircraft.

LORAN-C still operates throughout continental US and most of Alaska, using 24 land-based US stations. A partnership with Canada and the Russian Federation stations extends the coverage to Canadian waters and the Bering Sea. The absolute accuracy of the system is better than 0.25 nautical miles for suitably equipped users within the published operating areas.

With the advent of the Global Positioning System (GPS), the decommission of the LORAN-C system has been forecast over a number of years. However, in 2005, the US Coast Guard confirmed that it would continue to support the system for the foreseeable future. The European Radio-Navigation Plan (ERBP) recommended LORAN-C as a core technology for the EU to use as a means of extending coverage to all of Europe; and Norway reversed its decision to close down its transmitters.

The first operational GPS satellite was launched in 1978 and by the mid-1990s the US Department of Defense had an operational system of 24 satellites, almost 20,000 kilometres above the earth's surface, and travelling at 11,000 kilometres per hour. Known as NAVSTAR GPS1 or Navigational Signal Timing and Ranging GPS, it costs around $400 mill per annum to operate and maintain.

A second GPS system, GLONASS, is operated by the Russian Federation. Like NAVSTAR, it too is freely available for civil use. The system obtained full global coverage in 1995 with 24 satellites. Unfortunately, the low reliability of the satellites and financial constraints have caused the efficacy of the system to be reduced. However, the Federal Guide Programme 2002 to 2011, calls for the system to be restored and developed. It currently appears that progress on the plan is not going as intended, and there are doubts as to its achievability on grounds of financial affordability, and international acceptability.

Both the NAVSTAR and GLOSNASS systems operate on two bands of accuracy, the higher one for military purposes and the lower accuracy band for civilian navigation. The public service is available to anybody with a suitable receiver, is free at the point of use, and the identity of the user is not required.

Generally, accuracy levels are within 20 m; but in areas where WAAS (Wide Area Augmentation System) is available, the correction factor can bring the accuracy in longitude/latitude and altitude to within two metres, although this system is more relevant to aviation than to maritime operations.

Looking at NAVSTAR, in addition to the satellites it has five ground control stations around the world; four of which are unmanned, and the other is the master control station. Satellites wander off course and one of the functions of the control stations is to determine correction factors for orbital position and for time, and send it to the satellites.

On the ground or at sea, the GPS receiver must have a clear view of the sky, free from physical obstructions, in order to receive signals from the satellites. Two types of coded information are sent from the satellite to the receiver. The first is known as almanac data, which contains details of the approximate location of the satellites, and the second, ephemeris data, the exact position of the satellites as corrected for accuracy by the master control station. The ephemeris data is valid for four to six hours, thereby enabling the GPS receiver to know the position of the satellites at all times.

An additional item of information required before the receiver can calculate geographical position is to know the distance from the vessel to the satellite, and this is calculated from the simple formula Velocity x Time = Distance. Radio waves travel at the speed of light, that is 300,000 kilometres per second; but to determine time is a little more difficult. The satellites use an atomic clock that is extremely accurate, however, the GPS receiver does not, therefore, in order to correct for this internal time delay discrepancy, a minimum of four satellites must be tracked and their time periods recalculated to eliminate the clock error within the receiver.
TECHNOLOGY - NAVIGATION SYSTEMS

With the GPS receiver having obtained accurate orbital positions and the distance for the satellites it can receive from, it calculates position by means of intersecting arcs. Information from three satellites is required to obtain a two-dimensional longitude/latitude fix; four are necessary if altitude is needed. In reality, the receiver will have between five and 12 satellites in view, and selects the best of these to update the position.

The EU plans its own system called GALILEO, which is budgeted to cost Eur3.4 billion. GALILEO differs from the other two satellite systems in that it is specifically designed for civilian purposes and, it is claimed, will be more advanced, more efficient, and more accurate than NAVSTAR. There are a number of shortcomings in the NAVSTAR system, and problems have been reported by Canadian and French civilians that signals have been lost without warning for as long as 20 minutes. Also, unlike NAVSTAR and GLOSNASS, there is no possibility that in a military crisis it would be cut off for civilian use.

GALILEO will comprise a constellation of 30 satellites orbiting on three circular paths at a height of 23,000 kilometres. The importance of an additional system has been recognised, and agreement between the US and the EU has been made for interoperability and compatibility, thereby establishing a world standard for a GNSS or Global Satellite Navigation System. China has joined the joint undertaking agreement with the EU and will contribute Eur200 million to finance specific activities of development, and discussions are continuing with several other countries with a view to making a financial and technical contribution. The European system will be financed as a public-private partnership, with a minimum investment of Eur500 million, and its operation will be awarded as a concession in an open bid procedure.

In maritime navigation, the objective of GALILEO will be to provide on board services for ocean and coastal navigation, port approach and port manoeuvres, and to integrate with new systems such as the AIS. Anticipated benefits from the system include accuracy to within one or two metres longitude/latitude, and from three to five metres horizontally, and, importantly, a minimum of six seconds notification after a malfunction.

Unlike the limited use performance that is available from a sextant, which required the stars to be seen, GNSS will enable navigators to know exactly where they are 24/7, in clear blue skies or pea-soup fog, notwithstanding that the final direction in which the system is steering remains to be successfully charted.

1. NAVSTAR GPS is commonly known as GPS, however for the purposes of clarification NAVSTAR is used throughout this article.

SAM launches latest IBS

At the recent SMM exhibition, SAM Electronics unveiled the latest version of its C5 design ship control centre (SCC), which is an integrated bridge assembly including navigation, communication, propulsion control and alarm monitoring functions accessed via a series of new ergonomically-designed, standardised 23 inch flatscreen monitors.

The SCC has been two years at the project stage. The complete assembly includes the latest NACOS 5 integrated navigation command system, incorporating a radar-controlled Trackpilot, ECDIS and other key functions. These functions include a new generation series 1100 multipilot, radarpilot, trackpilot, conningpilot, chartpilot and chartpilot facilities, supported by multi-function consoles. Newly developed sub-assemblies include a Debeg 4620 dual-channel echosounder, a Dolog 4682 dual-axis Doppler log and a 4642 EM log with a 4900 multi-purpose digital display unit.

Integral communications include systems for GMDSS, satcom, shipboard and internal alarm functions, while the automation facilities cover ship management, monitoring and control, as well as remote control of the main engine and power generation plant.

The SCC has been designed to fit on board ships of all types and sizes. It comprises a complete standardised package of common hardware and software, which can be adapted to individual ship operational requirements. SAM also claims that it significantly reduces installation costs, meeting the so-called one-stop-shop requirements of shipyards, SAM’s main customers, for the single supply of turnkey bridge configurations, typically meeting GL and DNV class requirements.

SAM’s also showed SeaSense, a hull stress monitoring system, which can be operated anywhere on the ship. Combined with a weather indicator, it can react to changing conditions in 60 secs. As the stresses increase, by reading the monitor, a watchkeeper has the option of quickly reducing speed.

Another innovation on show was the SAM 4620, which is a new compact type-approved IMO-compliant navigation echosounder for both shallow and deepwater operations.

It can be used as a switchable single of dual-channel mode over depths of between 5 m and 1,000 m in increments of five specific ranges. The depth displays can be shown either in fathoms or feet. TFT displays show lat/long and speed data, which can be annotated with date and time when connected to a GPS unit. Data can be transferred to an ECDIS, VDR and other sensors via RS-232C and RS-422 interfaces.

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On extended ocean voyages the need for fast, reliable communication has always been clear. Inmarsat understand this better than anyone, which is why we’ve doubled the speed of our Fleet 77 service to 128kbps. Now every Fleet 77 user has access to the world’s fastest uncontended demand-assigned data channel. For downloading maps, charts, weather reports and the occasional bouncing baby boy, there’s no better service. To find out more about the high performance Fleet 77, go full ahead to inmarsat.com/fleet
For 60 years radar has had to use short high power pulses of microwave energy to detect contacts on the sea surface. SharpEye™ changes all that as in essence, KH has eliminated the magnetron and high voltage modulator from its latest series of radar transceivers thus taking detection performance and reliability to a new level.

A radical approach within the transceiver enables more information to be extracted from the radar returns before being processed by the display, allowing detection techniques, which are normally only found in multi-million dollar military systems, to be available in commercial marine radars.

The new S-Band SharpEye™ system will detect targets in clutter long before conventional radar. It achieves this through the use of a monostatic pulse Doppler solid state transceiver, which uses the Doppler effect to determine the targets’ velocities. It features advanced pulse compression, which processes received echoes into velocity bands enabling it to separate the wanted targets from clutter.

With no items requiring periodic replacement, SharpEye™ is claimed to be a truly ‘fit and forget’ technology - reliability is maximised, maintenance is minimised and performance is enhanced to a new level, while it can be fitted to existing KH’s Nucleus 3 and Manta systems.

In the SharpEye™ radar the solid state power amplifier has a peak output power of just 170 W, this contrasts with typical marine radar systems in which the magnetron has a 30 kW peak output. But the new system produces more energy than the magnetron system, therefore exceeding conventional radar in detection performance.

It continuously measures key performance parameters, such as RF output power, VSWR, oscillator frequencies and receiver sensitivity and informs the operator that the radar is operating within its performance envelope. The system automatically alarms if there is any degradation in radar performance and removes the need for the periodic performance checks.

"This revolutionary new system from Kelvin Hughes is a major leap forward for the marine navigation industry", said KH’s managing director Ron Nailer, "We are so confident of the reliability of this new technology that we are offering a lifetime guarantee in support of SharpEye™ technology."

Not stopping there, KH has developed the world’s first widescreen bridge using the new MantaDigital™ common core processors, which was also shown at SMM.

Looking forward to the new IMO standards coming into effect in 2008, the new common core processors will meet the requirement for enhanced performance in radar processing and tracking. They have also been designed to be truly multi-functional with the capability of enabling the display of radar, chart, radar + chart, HAP and much more.

Using the latest widescreen flat panels, the new MantaDigital™ bridge comprises three completely multi-functional displays, each panel is capable of showing digital charts, radar, conning information or the new and unique dual PPI function.

The ability to display different scales, orientations, motion modes and trail modes from the same radar sensor on the dual PPI provides an added safety benefit for the mariner. On the main PPI the navigator will be able to use the chart radar in many configurations for his anti-collision and general navigation.

On the second PPI display, located on the same screen, the operator is able have the range scale looking further out to assess risk further down his planned track.

The MantaDigital™ chart radar is capable of being configured for many different users’ preferences.

Processors are already available for ECDIS, VDR and S-VDR. The new KH chart radar will be available in 2007, to meet the new IMO standards. Extensive digital processing and clutter-reduction algorithms are used to exceed the new radar performance standards, improve reliability and reduce service interventions saving time and reducing costs.

The new MantaDigital™ Widescreen Bridge has been designed to:

- Reduce the operator’s workload by simplifying the use of radar.
- Incorporate the new MantaDigital Chart Radar.
- Provide Dual PPI displays on the same screen.
- Integrate SharpEye technologies to maximise detection and tracking capability.
- Provide correlation of radar and AIS for improved target tracking and collision avoidance.
- Use the latest technology to increase and enhance safety at sea including the use of picture in picture technology.
- Greatly enhance reliability and reduce through life costs by using common core technology.

The radar processor is designed to provide facilities for remote diagnostics through a network or modem link to include:

- Remote software upload - for both primary radar application and embedded software.
- Remote diagnostic download - for configuration data, runtime parameters and recorded radar data for analysis.
- Remote control of radar.
- Remote download of total operational hours (that is run-time) for all components with a limited life (for example, if magnetrons are used).
- Service call initiation (under operator control) - automatic fault finding and reporting.
New slow speed engines to be launched next year

Today is no exception as new slow speed diesel engines are under development, new agreements have been signed and senior personnel are on the move. And an agreement has even been announced to cooperate with rival MAN on certain aspects.

Four new slow speed engine types are currently under development in Winterthur using the platform concept - a favourite method of the vehicle construction industry. This entails standardising the parameters as far as possible to reduce costs. Many components will be identical, giving the benefit of rationalisation in design and manufacturing, greater volumes, lower manufacturing costs and also simplifying the list of spare parts.

Two of the engines are dedicated to the large tanker sector, while the other pair are intended for containerships. The tanker prime movers are designated as RT-flex82T and RTA82T. Each type has an engine bore of 820 mm, but the tanker versions will differ from their containership counterparts in that the ‘T’ types will have a stroke of 3,375 mm to suit the shaft speeds required for the propulsion of large tankers of up to 350,000 dwt. These engines will be built to power ranges of between 21,750 kW to 40,680 kW at 68-80 rev/min.

In an article in the quarterly magazine Twentyfour7 written by Wärtsilä’s project development director Kaspar Aeberli, the company said that to help provide superior operating performance, the layout fields for these engines, as defined by the power/speed ratings R1, R2, R3 and R4, are extended to include the ratings R1+ and R2+. The latter pair provide the same power levels but with increased shaft speeds. The extended fields offer wider flexibility by selecting the most efficient propeller speed for the lowest daily fuel consumption and the most economic propulsion equipment, namely the propeller shafting, among others.

The new RT-flex engines will also have the option of Delta Tuning for lower fuel consumption at part loads compared with conventional camshaft type engines. This system takes advantage of the flexibility in fuel injection and valve operation allowed by the common rail system.

Another innovation leading to the superior operational economy of the new engines is the improved cylinder lubrication, which is down to the addition of Wärtsilä’s pulse lubrication system (PLS). This allows much lower lubricating oil feed rates than the previous systems fitted, while improving the distribution of cylinder lubricating oil on the running surface of the cylinder liner.

Aeberli said that the PLS features precise, electronic control of feed rate and timing with full flexibility of settings. Jets of cylinder lubricating oil are sprayed onto the liner surface from a single row of quills arranged around the liner, each RT-flex engines have proved popular with yards and owners.
RT-flex diesel engines are proving to be popular and Wärtsilä expects that this will be the case with the new 820 mm bore engines. The RT-flex versions have additional benefits, including smokeless operation at all engine speeds, lower stable running speeds, lower fuel consumption and consistent engine settings for lower maintenance.

Industry leaders to co-operate in large research project

The two major European-based marine engine manufacturing companies, MAN Diesel and Wärtsilä Corporation, have agreed to initiate a large scale co-operative research project, dubbed Hercules-B.

The research project's goal is to maximise fuel efficiency while at the same time reduce emissions. For example, the

principal aim of Hercules-B is to improve efficiency of marine diesel propulsion systems to level of more than 60%, hence to reduce fuel consumption and CO2 emissions substantially.

In addition, the joint aim is to manufacture engines giving ultra low exhaust emissions by the year 2015. Today, diesel propulsion systems power 99% of the world's fleet.

The project will produce a number of technologically advanced demonstration engines, operating with improved efficiency and reduced emissions. Some of the new technologies developed, will be validated on board newbuildings.

Hercules-B is planned to run for a four-year period with a targeted budget of Eur60 mill. The project is expected to be fully agreed in 2007.

Funding is expected to come from the EC’s Framework Programme 7 (FP7, Theme Transport).

Thrust transmission is achieved by the use of thrust sleeves positioned on several hold-down bolts. All ancillaries and their arrangements are optimised to reduce installation time and operating costs with minimum electric power requirements.

The first example of this new type is due for completion towards the end of 2007. Production is underway in co-operation with Hyundai Heavy Industries, which is providing support with engine production design and testing by using HHI’s existing facilities and manpower.
First all-electronic four-stroke diesel engine introduced

MAN Diesel recently received its first order for the new 32/44CR diesel, the first medium-speed, large four-stroke engine to feature common rail fuel injection as standard equipment. Moreover, since electronic engine control is very much the enabling technology of common rail fuel injection, the 32/44CR engine is also MAN Diesel’s first all-electronic four-stroke.

An increase in stroke marks the engines as more highly efficient than their predecessors.

Significantly, this new development from the company’s four-stroke business unit based in Augsburg, Germany, will not be offered with any other form of fuel injection. “This situation reflects both our absolute confidence in our common rail system and the market’s confidence in MAN Diesel’s electronic controls, based on several years of commercial operation,” said Dr Wolfram Lausch, senior vice president, large propulsion business at MAN Diesel. “In fact, the 32/44CR engine is creating immense customer interest and above all, this strong anticipation is based on the new engine’s ability to meet future emissions limits for oxides of nitrogen (NOx).”

The 32/44CR diesel offers a high cylinder output of 560 kW and is derived from the established 32/40 heavy fuel engine, which was the first MAN Diesel engine to be fitted with common rail fuel injection and electronic engine control. Moreover, since electronic engine control is very much the enabling technology of common rail fuel injection, the 32/44CR engine is also MAN Diesel’s first all-electronic four-stroke.

Protect your fleet and the environment by specifying HYDROX BIO lubricants in the sterntube.

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TECHNOLOGY - PROPULSION

has been undergoing successful field tests for a considerable time. In this way, the company has been able to verify the performance of important components like the common rail system itself and the engine control system.

One of the major product objectives with the 32/44CR was to fully exploit the benefits of common rail in both engine performance and engine construction. "A fuel system which allows high injection pressures to be created independent of engine speed allows much closer adaptation of engine performance to a specific application than ever before, and also allows improvements in aspects of engine design," explained Dr Ralf Marquard, senior vice president R&D Engineering at the MAN Diesel four-stroke business unit. "Thus, with the adoption of common rail technology on the 32/44CR we were able not only to achieve high specific power output but also market-leading fuel efficiency and extremely low exhaust emissions, including invisible exhaust gases over the entire load range."

The basic difference between the 32/44CR engine and its 32/40 predecessor is a 10% increase in stroke. "To achieve high specific output, low fuel consumption and low noxious emissions, the stroke dimension has been increased from 400 mm in the 32/40 engine to 440 mm in the 32/44CR and the engine equipped with flexible and intelligent common rail fuel injection and a considerably more efficient turbocharger," said project leader Stephan Haas. "In deg C) and demonstrated its ability to withstand typical HFO operating conditions like high temperatures and high fuel viscosity," reported Ludwig Maier, head of the MAN Diesel fuel injection department. "Likewise, components and their special coatings have proven well able to withstand wear due to abrasive particles and the aggressive use of the engine," noted Maier.

Turbocharging

The newly developed radial flow TCR turbochargers used on the 32/44CR engine feature an increased compression ratio has made it possible to gain strong benefits in the NOx - particulates - fuel consumption trade-off."

Turning to valve and injection pump actuation, the new engine employs two camshafts. A standard, full-length camshaft is used for actuation of the gas exchange valves and a shortened camshaft for the high-pressure injection pumps. "This shortening of the injection camshaft not only reduces its friction characteristics but also engine manufacturing costs," Haas confirmed. "It is an example of how the adoption of common rail fuel injection can improve not only engine performance data but also its design and manufacturing."

Common rail injection system

First announced in 2004 on the 32/40 heavy fuel engine, the MAN Diesel common rail fuel injection system has now proven its performance in over 20,000 operating hours. "Our common rail system has verified its compatibility with HFO of viscosities up to 700 cSt (at 50

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Hull cleaning is now a science

In March of this year, the UK's Portland Port in Dorset celebrated 10 years of commercial operation, having taken over the Royal Naval dockyard from the Ministry of Defence. Since that time, some 25 companies have located within the port, offering services including engineering, bunkering, and agency. It is also currently experiencing a growing demand for underwater repair and maintenance services, reports Brian Warshaw.

Through two companies, Dive Technologies and UMC International, the port can offer underwater surveys, hull cleaning and repairs, propeller inspection and polishing, blanking, inserting, and anode replacement. Of growing interest to the tanker, and shipping industry generally, is in-water hull cleaning and propeller polishing, as a way of reducing fuel costs and maintaining journey times. The question exercising the thoughts of many in the shipping industry is, however, how to determine the optimum moment when these techniques should be applied.

Speaking at the Protective Coatings Europe conference at SMM held in Hamburg last month, Torben Munk, president of Propulsion Dynamics, said that around two-thirds of the world’s shipping above 10,000 dwt, is burning more fuel than is necessary to reach its destination on time. Half these vessels could improve their performance without affecting commercial operations, by using routine cleaning techniques that would not compromise the integrity of the coating. The other half requires comprehensive hull treatment in drydock before performance can return to a level attained at the original sea trials.

Munk implied in his Paper, The Effect of Drydock Treatment and Coating Selection on Hull Efficiency, that this situation did not arise from either unawareness or complacency about the problem. He said that owners were spending a lot of money to mitigate hull degradation, ‘...the total costs of all shipowners’ anti-fouling precautions are of the order of $1.5 billion per year, or approximately 5% of marine fuel oil costs.’

During the past few years, the marine coatings industry has fully engaged in responding to the concerns of marine biologists to rid the world’s shipping fleet of tributyltin self-polishing copolymers (TBT SPCs) coatings. In doing so, the industry has produced two systems that meet those concerns, and has, in addition, retained or improved the means of controlling hull fouling. By 2008, when the presence of TBT anti-fouling coatings will be banned on all ocean-going vessels, it is expected that these systems will encompass 80% of the anti-fouling market.

The first of the coatings, tin free SPCs, works in a similar way to TBT SPCs. The surface coating, slowly dissolving as the vessel moves in the sea, releases biocides that kill the targeted marine organisms that invade the hull. With the tin having been replaced by copper, zinc or silyl, the biocides do not have the same harmful effect on the wider marine life at sea.

Second is a system that seeks to prevent the attachment of marine organisms to the hull. Foul release coatings utilise silicone to give it an element of flexibility; a flexibility that makes it difficult for organisms to attach to the hull, and where successful, causes them to drop off at the faster speeds of motion through the water.

Useful as these developments are, coatings can never alone, provide the complete solution to attaining and retaining optimum hull efficiency. There are too many other factors that affect the hull, not just service conditions, such as time in port, loading balance, service speed, port water contamination and water temperature; but also damage caused by anchors and cables, tugs, fenders, and groundings.
TECHNOLOGY - UNDERWATER MAINTENANCE

For the shipowner, optimum hull efficiency can only be achieved through more precise knowledge. Knowledge of how the vessel is performing on the voyage, in real-time. Then, by taking appropriate action to return the hull and / or propeller to good condition, whether that requires minor or major underwater cleaning, or more extensive maintenance.

CASPER® (Computerized Analysis of Ship PERformance) uses an advanced hydrodynamic method for determining the true speed of the vessel through the water. Developed and perfected in Scandinavia by Torben Munk, the system was taken to the US and Propulsion Dynamics was incorporated in 2002 to offer the service to international shipowners. More than 50 vessels of different sizes, ages, and maintenance history, including tankers, cargo ships, bulkers and cruise liners, have signed up for the service and benefited from the results.

Daniel Kane, VP business development, said that transport capacity and speed were the critical components in the economics of operating a ship, yet the inability to determine the true speed through water makes it difficult to determine precise performance penalties due to fouling.

'Traditionally', explained Kane, 'the service speed of a vessel is determined during the ship's sea trials, with an allowance being made for a decrease in the power demand and a reduction in the maximum continuous rating (MCR) of the engine. This corresponds to 70% of the engine MCR or about 90% of the trial speed achieved with full engine power.

'For example, if the vessel produced 20 knots during the sea trials', he continued, 'then a service speed of about 18 knots would be assigned to the vessel.'

Uncertainties. Corrections will have to be made for wind speed, waves, and the vessel's draft and trim; corrections which require complex technical knowledge and trained personnel. More difficult still, is how to determine the speed through the water; the speed log is of insufficient accuracy for this purpose, since it is not measuring speed outside the boundary layer of the ship and the US Coast Guard's maritime differential global positioning service, while providing great accuracy, has to be corrected for the sea current, which is almost impossible to ascertain from the vessel.

CASPER® is claimed to provide the solution. Observations from on board the vessel are transmitted by Internet to Propulsion Dynamics once a week. Many of the requirements are already part of the normal noon reporting, and there is no need for additional instruments, computer software, crew members, or specialist training, to gather the information. The observations and figures are processed and CASPER® calculates the actual service speed in relation to the ship particulars and sea trial performance when the vessel enjoyed the cleanest, smoothest hull. According to Munk, '...once we know the true speed through water, we can calculate the added resistance, which is a non-dimensional figure that can then be translated into precise speed and fuel losses due to fouling.'

'The results that CASPER® has achieved for Propulsion Dynamics clients have been truly remarkable', claimed Kane. 'On many of the vessels we have analysed, we have found that the hull and propeller resistance has grown at a faster rate than would be expected due to marine growth, in some cases by more than 40% of the smooth hull resistance. How this translates into technical management of the ship is that a 47% increase in added resistance due to fouling, for a VLCC, this equates to a speed loss of 1.6 knots with no increase in fuel consumption; but if the vessel attempted to maintain its design speed, the increase in consumption would be over 30 tonnes per day.'

Teekay Shipping, in a best practices presentation, confirmed that half-a-knot speed increase was the equivalent of 12 nautical miles per day; 3,000 nautical miles per ship per year or almost nine charter days.

Figure II illustrates the use of CASPER in monitoring hull efficiency for a fleet of vessels of similar design and age, in similar service patterns. All vessels received a full hull blast in dry dock, with the only differences being the application of different hull coatings. The lines drawn reflect only the development of hull and propeller resistance for all seven ships out of dock between 100 and 500 days. The step-decreases in resistance for some of the ships indicate the decrease in resistance and improvement in performance.
from underwater maintenance. The reports that Propulsion Dynamics produces for the shipowner are a cost-benefit tool for fuel-optimised maintenance intervals, and condition-based drydocking, as well as plotting the before-and-after effects of new hull coatings and hull cleaning techniques on ship performance.

With bunker fuel prices at an all time high, and the almost certainty that they will remain high or increase substantially during the lifetime of the vessel, keeping the vessel hull and propeller at optimum efficiency is money in the bank for the astute shipowner.

Portland Port, due to the clear water conditions, where up to 20 m depth can be viewed, has been favoured by UMC for the underwater trials and testing of its new products, and it has an established office operating within the port. Commercially, UMC has carried out more than 250 underwater repairs and surveys to ships within the safe harbour walls of the port.

A rapid repair response to a tanker that’s on a tight delivery schedule makes all the difference to a ship’s captain,’ explained Dean Loomes, UMC’s Portland branch manager, ‘If his vessel does not have to waste valuable time waiting to drydock for repairs or maintenance, this can represent a huge saving of both time and money to the ship operator,’ he concluded.

‘It is no longer acceptable to assume that the antifouling paint is not worth preserving, just because the hull is fouled,’ explained UMC’s commercial director, Peter Stevenson. ‘Underwater cleaning should be an integral part of planned maintenance and not just a temporary solution. The next drydocking might be a long way off and the paint surface needs to be treated with respect,’ he concluded.

A recent product development by UMC is a cleaning brush designed to remove marine fouling from low surface energy foul release coatings, without causing coating damage. The brush is an add-on product to the suite of brushes available for cleaning various hull surfaces for use with the Mini Pamper underwater cleaning machine.
S

T

ech the new navigation system also needed to meet the ENC trading area requirements and be in a format that the crew found easy to learn and use. Cooper said: "At the time we took over the management of Senatore and the Noemi, the vessels were using the Admiralty ARCS Navigator service that had been subscribed to by the previous managers. It was decided that we would opt for a maximum ENC based approach to satisfy ECDIS regulatory requirements, while at the same time retaining sufficient ARCS coverage to ensure that first time users of the system would feel at ease with its use. "Because the present level of ENC global coverage is still not available to provide the level of comfort required to meet navigational, legal and industry standards, based on an internal risk assessment, we opted for full paper chart folios covering vessels trading areas, in tandem with ECDIS usage. We contacted our chart suppliers, Thomas Gunn Navigation Services, to explore the various options available in the market to meet our ENC trading area requirements. After a lot of information was exchanged, and following detailed evaluation of the various choices available, it was clear that our wish to upgrade the ARCS Navigator service on board, to a service providing maximum ENC usage (where available) was best served by the Admiralty ECDIS service," he continued. Colin Stephenson, digital products manager, at Thomas Gunn explained the options put forward to Scorpio. He said: "Scorpio initially asked us to give them some advice about the range of options available for supplying approved electronic charts for two vessels that had recently come under their management. "The trading area for both of the vessels covered the major load ports of UK, northern Europe, Baltic, Bay of Biscay, Spain, Portugal, Mediterranean, Black Sea, West Africa, East Coast of South America, Caribbean, US Gulf and East Coast of the United States and Canada. "The vessels were fitted with dual ECDIS units from their delivery in 2004. They were subscribed to the Admiralty ARCS Navigator service, by their previous managers. Scorpio wanted to benefit from using ENCs, but at the same time make sure of the transition to their use while at the same time ensuring this was in such a format to facilitate the crews' familiarisation." The draft proposals considered the following various options; 
- Supply of ARCS Navigator service.
- Supply of ENC and ARCS Navigator service as separate licences.
- Supply of Admiralty ECDIS service folios.
- Supply of C-MAP Vector charts.

The costs and benefits of each of the options was considered and the three non-ECDIS service proposals were rejected for the following reasons - the ARCS Navigator service did not provide the crew with experience of ENCs; separate ENC and ARCs licences meant additional operating expense to continually purchase ENCs when they became available; C-MAP Vector charts - although this gave the best vector chart coverage, the option was not considered because they are not official data. Although the Admiralty ECDIS service did not provide complete ENC availability for the vessels trading area, this was considered the best option because of the following:
- ENCs and ARCS charts are both official data that meet IMO requirements.
- New ENCs are automatically added when they become available.
- Where ENCs aren't available, ARCS charts fill the gaps.
- ARCS charts display is familiar to paper chart users.
- One off annual subscription fee with no additional costs through out the licence period. The first vessel, Senatore, was supplied in October 2004 and the Noemi a month later and although there were some minor installation problems they were solved via Scorpio's digital support staff and the systems are now operating satisfactorily. Cooper added; "We are pleased to say that our masters report a high level of satisfaction with the
use of the Admiralty ECDIS service and we have indicated our desire to continue with it on the two vessels when the subscriptions come up for renewal at the end of the year."

Feedback
Scorpio Ship Management recently contacted the two vessels and asked the Masters and crew to report back their thoughts on the main day to day practical benefits of the service.

It was said that navigating in congested waters under pilotage and in poor visibility became much safer as the officer does not have to retreat to the chartroom every few minutes to plot the vessel’s position. Navigation in narrow channels and safety fairways also became simpler and safer as the ships progress can be monitored continuously and effective action can be taken immediately if the vessel is observed to be deviating from the plotted track.

With real time visual displays of targets and navigational information it made approaching and anchoring relatively easier, giving the navigator extra time to evaluate the situation and take prudent action.

Administrative
Thanks to the simple licencing arrangements, the Admiralty ECDIS service provided the option of having only charts (ARCS and ENCs) for the areas activated. This made it more economical for the owner and time saving for the navigating officers. Additionally, the possibility of licence renewal via e-mail helped to keep the system constantly geared up to support the vessels’ worldwide trading needs were their trading areas to change at any given time. This was a task not always easily achievable with paper chart folios.

An example of the benefits of the licensing system came to the fore recently when one of the ships provided with the Admiralty ECDIS service was diverted to a port outside the vessels’ usual trading area, and did not have the requisite paper charts on board. Licensing arrangements were made via e-mail and chart coverage rendered usable on the ECDIS.

Familiarisation
This Service was found to be much easier for a first time user, due to the presence of the ARCS charts that are replicas of the paper charts widely used. It was also easier for an operator to move from one to another where both systems are in use. This ability to make the transition from ARCS to ENCs provided additional confidence to the navigator during the induction process.

Chart corrections
Corrections were done quickly by using the updated CD’s provided by the chart supplier. It also ensured that no corrections were missed out due to the possible oversight of the navigating officer. Updates provided on CD cut down the workload of the navigating officer, leaving him or her ample time to attend to the primary responsibility - watchkeeping. Base CD’s gave the latest edition of charts, new charts and automatically deleted the cancelled charts, again taking care of any possible human error.

Weekly update CDs were cumulative. Only the most recent

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CD was needed to update each ECDIS. An example of the benefit of this system was highlighted when one of the mail packets sent out to a vessel, containing among other things update CDs, went missing in transit. The vessel received the latest update CDs at the next port and data was updated on the ECDIS units, without needing to receive and load a copy of the earlier updated CD that went missing in transit.

**Passage planning**

ENCs enabled the operator to customise the information on screen and to cut out information not required for a certain passage. Pre-planning the vessels route became much easier, as the operator could readily flip from large scale to small scale charts. Safety checks could be carried out in advance in the passage planning stage for verifying safe depths, safety margins, safe clearances and so on. Route saving and route reversing functions made the passage planning relatively easier with retrieval/reversal of a saved plan available at the click of the mouse.

**Better data presentation**

The vessel's officers had better control of navigation planning and execution using the Admiralty ECDIS service, whenever they were required to demonstrate this to third party inspectors. Along with the update CDs the vessel also received Schedule A amendments that enabled the vetting inspectors to view the corrections and updates in a paper format for ease of scrutiny and verification.

*This case study was prepared with the assistance of Captain Ashley Cooper, safety and security manager, Scorpio Ship Management and Colin Stephenson, digital products manager, Thomas Gunn.*

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### Admiralty products to be enhanced

Admiralty Digital Radio Signals (ADR) Volume 6 will soon be the latest addition to the growing Admiralty products family. A beta version of the product was demonstrated on the Admiralty stand at the SMM along with its well established sister products, Admiralty TotalTide and Admiralty Digital List of Lights (ADLL).

When officially launched in early 2007, ADRS will provide detailed information and working procedures for pilot services, port information, vessel traffic services (VTS) and reporting systems, as well as contact details including callsigns, VHF channels, telephone number, fax number, telex number, e-mail address and website. Also included are colour diagrams showing reporting points, pilot boarding positions and ports.

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### STAHL acquires Tranberg

**German explosion protection expert R STAHL and the shareholders of Norwegian lighting and signal system concern Tranberg have entered into a contract of sale whereby the Norwegian company’s title was transferred to R STAHL Technologies with effect of 1st October 2006. The price was confidential.**

Tranberg develops, manufactures and distributes lighting and signal systems used in shipbuilding and on helicopter landing decks, in addition to producing explosion protected heating and control systems for industrial applications. The company employs 60 persons at its Stavanger site and realised some EUR1 mill EBT on 2005 sales of EUR10 mill. Thanks to the synergy potential of the buyout, management expects additional global sales growth in the medium term.

With the integration into the STAHL group, the Norwegian enterprise is now benefitting from the group’s international distribution network, while the merger gives STAHL a foothold in the shipbuilding sector. Tranberg will be an arm’s length subsidiary under its parent and will serve as STAHL Technologies’ centre of competence for shipbuilding and heating technology issues.

The demand for oil and LNG carriers is set to rise owing to the increasing market demand. Last year, STAHL entered the booming South Korean market. Its activities in that country will greatly benefit from the addition of Tranberg's high-quality products.

Founded in 1988, STAHL subsidiary STAHLSyberg is Norway’s market leader in explosion protection. The company will remain STAHL’s centre of competence for the group’s oil and natural gas activities, as well as the chemical sector business in Scandinavia as far as the existing product range is concerned.

"This acquisition is a major step forward in our growth strategy. We are quite confident that we can successfully integrate Tranberg into R STAHL Technologies and quickly realise the expected synergy potential," said STAHL’s ceo Martin Schomaker.

Schomaker told TANKEROperator that for the next five to 10 years, the company will continue to grow strongly, especially in the LNGC and tanker sectors. One equipment area that the company intends to exploit is remote controlled searchlights, enabling the lights to be switched on from one control point.

A complete fieldbus system can be built up for hazardous systems and areas with remote communications to a vessel’s bridge via signals and sensors fitted in the fieldbus cabling. By using this method, less weight is used, but very high reliability is assured, claimed Schomaker. He said that the tanker industry is one area where this system is being marketed.

He said that STAHL’s turnover amounts to 30% in oil and gas, 34% in chemical, 20% in pharmaceuticals and around 6% in shipbuilding, plus minority involvement in other industry sectors.

The company is heavily into R&D with some 90 people employed in this department developing new products out of a total of 1,160 employees. Schomaker said that Tranberg would be built up further and the name expanded.

At present STAHL has a turnover of around Eur150 mill and subsidiaries in 20 countries. In the explosion/hazardous business, Schomaker claimed that STAHL was No 2 in the world.
The issue: VOC loss during transportation is predominantly caused by manual de-pressurization lowering tank pressure to levels that encourage increasingly more boil-off. According to industry studies, in-transit tank pressure is manually controlled due to crew misgivings in regard to erroneous flow charts, unaccounted pressure build-up, leak rates, and hammering causing damage to internal parts eventually leading to jamming. These studies estimate the VOC loss at 0.2% of the crude transported.

The solution: Type HS-ISO-LM is a magnet-operated high velocity p/v valve with an upstream, in-line pilot-operated membrane. The gas sealing force increases with increasing tank pressure to keep the valve tight. At 80% of the set-pressure, the sealing force is 10 times higher than with a weight-loaded valve. At set-pressure the valve opens instantly to full stroke and likewise re-seats instantly at a pre-determined pressure, all with a view to allow escape of the bare minimum of VOC needed to protect tank integrity. By recording the number of openings (via the tank pressure monitoring system), the exact volume flow emitted can be calculated on basis of the calibrated blow-down value. Expected VOC saving is in the 80-90% range compared to traditional handling.

The achievement: Crew will experience tank pressure never to exceed the valve set-pressure and will take comfort in noting well-defined, two-position characteristics: open or shut. Alarm levels can be reduced to triple the warning time in case of malfunction. Cargo vapors are restricted from the main valve body except when actually venting, thus fouling and maintenance is reduced, and sloshing onto deck cannot occur.

RUNNING A TIGHT SHIP
– in full management of the VOC emission

FOR CHEMICAL CARRIERS
• No seeping cargo vapor at deck level
• Cargo and Nitrogen conservation
• Reduction of vent pipe diameter
• Dual set-pressure feature
• Reduced noise

FOR FPSO INSTALLATIONS
• High velocity nozzle can be removed downstream to location away from hydrocarbon alarms
• Full dispersion height at any tank filling rate
• Adjustable setting
• Adjustable blow-down
TECHNOLOGY NEWS

Gas industry takes up software

**BMT SeaTech has met with considerable success in the LNG sector with its PC Rembrandt software suit.**

The software has and is being used for risk assessment in shiphandling and navigational concerns, together with terminal operations, both for existing facilities and for the many still in the evaluation stage.

Recent projects have included LNG terminals in the Middle East, Gulf of Mexico (GoM), Australia, Asia and Europe on behalf of gas terminal operators, port and marine consultants, ship operators and civil engineers.

The focus of the assessments is to evaluate the ports and terminals to help ensure that they are suitable for the safe navigation and ship handling of different types of LNGCs, including those with different propulsion systems.

An LNG terminal and its approaches need to be thoroughly evaluated at the concept stage. Decisions taken at this stage are crucial to the safe operation of the terminal throughout its life.

The PC-based simulators can be used at all stages of the design and operational phases, from initial concept work through to ships’ officer training, while on board LNGCs. The scope of the training software offered includes:

- **Approach channel assessments** - dredging, navaids, alignment, bends, currents, traffic (crossing, passing and overhauling).
- **Berth assessments** - alignment, passing traffic (with mooring analysis), turning areas, effects of the proximity and occupancy of other berths.
- **Mooring studies** - line tensions, bollard loads, mooring plans.
- **Tug assessments** - number, size, use and optimisation plus tactics.
- **Navigation assessments** - contingency, emergency anchorage, aborted manoeuvres, safe operating windows, navaids positioning, risk assessments.
- **Ship performance analysis** - interaction, squat, operational envelopes, ship size, propulsion types, thrusters and rudders.
- **Training** - pilot familiarisation and training, pilot exemption certificate (PEC) evaluation, manoeuvre rehearsals.

Simon Burnay, BMT SeaTech’s manoeuvring simulation products manager told **TANKEROperator** that, "We can run a full course for roughly one third of the price of sending everyone to a typical full mission bridge simulator".

He also said that by running a course in a client’s office, there is minimal disruption and no travelling costs to be added. While some companies, such as STASCO (Shell) and BP have purchased their own licensed software, most clients tend to use BMT as a consultant in a partnership type of arrangement when opting for risk analysis and training.

Burnay said that a particular feature of the LNG industry, which puts it apart from other marine businesses, is the willingness of all parties involved from the civil engineer to the ship operator to sit around a table and plan ahead in what he called a "multi-disciplinary" approach.

He explained that in shiphandling terms there was a considerable difference between a membrane and a Moss-type LNGC in certain conditions. For example, the membrane type vessel has a lower area across the deck where the wind can react. There were also differences in shiphandling with the different propulsion systems on offer as well as taking into consideration whether an LNGC was of single or twin screw configuration.

As vessels have become larger, so the diesel-electric system has gained in popularity and this posed its own set of shiphandling problems, according to Burnay. He explained that the PC system is able to offer shiphandling simulation-type training both on board ship and ashore.

Other functions that can be undertaken by using the software include hyrodynamics. For example, the problems of ‘ship squat’ can be analysed for the proposed offshore terminals in the GoM, where the waters tend to be shallow. Burnay said that BMT SeaTech was working with the terminal operators to achieve a result. He said that even dredging costs can be shaved in some instances by running a risk assessment programme in certain circumstances.

Together with Southampton University, BMT SeaTech is also looking into the problem of sloshing as part of through-life fatigue assessments and hull stress monitoring programme.

The software is offered as a tailor-made package and not off the shelf, due to the many different uses it can be put to and configurations it can be programmed to. Down the years
**EnSolve wins USCG approval**

*At the end of September, North Carolina-based EnSolve Biosystems completed tests for US Coast Guard approval on the company’s unique bilge water treatment system - PetroLimiter PL630M.*

This system is claimed to be unique in that it is the only one operating using bioremediation technology. It already meets IMO MEPC.107(49) specifications.

Describing the tests, Jason Caplan, EnSolve’s president said “The PL630M consistently achieved effluent levels of less than one part per million (ppm) in oil content. The highest recorded measurement during the tests was just 2.2 ppm, far below the IMO limit of 15 ppm.” He explained that the system is rated to treat up to 20,000 litres (20 cu m) of bilge water per day.

He claimed that the technology used in the OWS is unique in that it uses safe non-pathogenic hydrocarbon-degrading microbes to destroy particles of oil and other contaminants in the bilge water. Caplan said that this green technology produces no harmful by-products and is hazmat free.

PetroLimiter will treat both pure and emulsified oil, as well as other organic chemicals, such as detergents, degreasers, glycols and transmission fluid. The system has a fail safe oil content monitor with automatic shut-off, which helps to ensure that no contaminated effluent can be discharged accidentally.

It is claimed to be virtually maintenance free. There are no flocculants to add or beads to change, thus reducing chemical and disposal costs. It can operate fully automatically and unattended 24/7. Capital investment and operating costs are also claimed to be far lower than those of other OWS systems.

*The technology used in the OWS is unique in that it uses safe non-pathogenic hydrocarbon-degrading microbes to destroy particles of oil and other contaminants in the bilge water.*

Data gathered during the tests indicate that the average operating cost is about $0.02 per gallon of treated water.

PetroLimiter operates as a non-pressurised three-stage tool for removing oil and other hydrocarbons from vessels’ bilge water.

In the first stage, contaminated bilge water is pumped directly into the OWS. The oil is separated from the water and suspended solids collect at the bottom of the system. An oil probe allows pure oil to pass through a solenoid-operated valve into a waste oil tank. The remaining oily mixture is continuously pumped into stage 2.

Stage 2 contains safe, non-pathogenic micro-organisms that convert oil, grease, transmission fluid, gasoline, fuel and other hydrocarbons into harmless end products. The oily water passes through a support medium to which the bacteria are attached. In turn the bacteria secrete a biological polysaccharide that tightly binds them to the support medium. This minimises bacterial washout as the water flows through the system. The oil and related contaminants are degraded in this biological layer, as the bacteria ‘eat’ the hydrocarbons.

The naturally occurring bacteria used in the system are safe and non-pathogenic. Detergents and other emulsifiers help this process by breaking up the oil into ‘bite size pieces’ for the bacteria to consume.

In the final stage (3), any remaining solid particles are removed prior to pumping the clean effluent overboard. The system’s oil content monitor continuously monitors the effluent prior to discharge. This added safety feature minimises accidental spills due to sampling time delay of monitoring systems.

The PetroLimiter has been successfully running for six years on various vessels. Caplan told TANKEROperator that he is now at the stage of looking for a network of partners to market the system worldwide.
TMSA CONFERENCE REPORT

TMSA in Hong Kong

TANKEROperator's (TO) TMSA conference in Hong Kong on 4th September attracted speakers from ASP Shipmanagement, Teekay, Wallem, Eurasia and Univan.

TANKEROperator held its fifth TMSA conference in Hong Kong on September 4th (following our conferences in Oslo, Rotterdam, Athens and Singapore), inviting experts from Anglo Eastern, ASP Shipmanagement, Teekay, Wallem, Eurasia and Univan to talk about what they have done with TMSA so far and where they see things going.

We learned that ExxonMobil has a computer system with information about tanker companies. Exxon feeds companies' TMSA reports into the computer system, which compares them with what Exxon was expecting.

If they are too high or too low, the company can expect an audit.

Both Teekay and ASP Shipmanagement said they thought BP had progressed the most in making best use of TMSA. However, it seems that Shell has moved away from it entirely, saying it was 'too vague' and should only be considered a management tool.

Not everybody is a fan of TMSA. Plenty of people in the tanker industry still think TMSA will create endless checklists and paperwork but achieve very little in terms of tangible results, like management systems which have gone before it.

Most of the speakers at TO's conference took the opposite view - you can try to pull the wool over the oil majors, or lie to them, or do the minimum in order to 'comply' - but fundamentally, you will probably get found out, and in any case you will miss a big opportunity to really improve your business. It makes much better sense to do it properly.

Gianpiero Soncini, CEO of maritime software company SpecTec, played devils advocate by presenting some of the normal complaints people have about TMSA - that it only affects a small proportion of the tanker market (that is, tankers chartered to oil majors, and not every oil major at that) and does nothing to encourage new standards with the rest. Also, no-one has yet come up with a management system which is impossible to fool - why should TMSA be any different?

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Dimitris Lyras, conference chairman, noted that he is seeing a trend in the companies, which agree to speak at TO's TMSA conferences - they are companies who believe that whatever they produce as management quality is good enough for the rest of the world.

"Companies who are here are confident that they are doing their best and that their best is worth considering by any prudent client be they oil companies or ship owners," said Lyras.

The essence of TMSA, according to Lyras, is making oil majors look good under scrutiny. We have seen the tough beating BP received after its oil leaks in Alaska.

Oil majors will come under the same attack if a tanker they are chartering has an accident - they will need to demonstrate to the international media the level of efforts they have gone to, to ensure all their tankers are well managed and in good condition, and tanker companies they charter are trying to continuously improve. TMSA will provide this framework.

TMSA is getting more support than might be expected from the tanker industry, Lyras said, being a voluntary scheme but driven by customer and market requirements. More compulsory regulation is the last thing most tanker companies want.

What TMSA does is give the high performing tanker companies some recognition, and possibly even reward, for their efforts - which will in turn make it easier to identify, put pressure on, and motivate, the worse performing companies.

Every other market in the world you can think of has a market mechanism to motivate quality. Why should tanker operations be any different?

Captain Pradeep Chawla, director of quality assurance and training with Anglo Eastern (see page 8), expressed his view that TMSA is oil majors "trying to lay down the standards expected from shore management".

"Our view is - TMSA is not about compliance, it is about commitment," he stressed. "The industry goes wrong in approaching schemes by aiming to 'comply' with them, without following the philosophies behind them."

"For example, ISM - yes we are doing it - but not in spirit," he said. "STCW - yes we are doing it - a bit cheating.

"If the industry starts with compliance, half of the battle is already lost. It's hard to go from compliance to commitment," he said.

Chawla went through all the elements in TMSA and gave his view on them, highlighting the stumbling blocks.

"Element 1 - commitment from the highest level - this is no different to any other standard," he said. Commitment has to be visible to the staff. It's wallpaper otherwise. Commitment must not begin and end for oil major audits.

"Every CEO wants to run a good ship - the issue is - what steps are taken.

Accountability at every rank is important. You need to transfer the commitment to department heads and line managers," he said.

"Companies employ consultants to say what is wrong. But typically people in the company know what the problem more than an external consultant can tell you. Is the staff absorbing the feedback from the ships?"

On Element 2 (Recruitment and Management of Shore-Based Personnel), Chawla said that the availability of shore staff is much lower than it was 10 years ago. "I have met superintendents who have never been to sea," he said.

"One area TMSA does not address is continuous professional development," he commented. "Would we like to go to a doctor who hasn't learned anything new in 20 years?"

On Element 3 - (Recruitment and Management of Ship's Personnel), Chawla noted that the total number of ships is increasing rapidly.

"Wages for captains and chief engineers on LNG carriers is going up to as much as $15,000 to $20,000 per month, he said. "The booming job market leads to an 'I don't care' attitude..."
He said he thought IMO's STCW (Standards of Training, Certification and Watchkeeping) had practically failed, due to poor vetting of the academies. "We still have a problem getting people to be practically competent," he said. "You and I in the market place know exactly which establishment is doing well and which isn't. But that information didn't see the light of day on the STCW White List."

"People say, he's done the vessel resource management (VRM) course, and look what he's done. He's done every course, but he's not done what he's supposed to be doing. It's the attitude of not wanting to learn," he said.

Chawla said he thought Element 4 - Reliability and Maintenance Standards was "one of the easier ones." However some companies are squeezing their budgets with maintenance, including shipping companies who signed long term commercial contracts several years ago, and are now having problems because of exorbitant crew and lube costs, he said.

Questions also need to be raised about the quality of inspection staff, he pointed out. He said he had heard about a lifeboat manufacturer unable to find ex-seafarers to do lifeboat inspections, and was employing 'ex shoe salesmen'. "They will be charging thousands of pounds to inspect lifeboats," he said.

On Element 5 - Navigational Safety, Chawla noted that the maximum cost due to a mistake by an engineer can be a few million dollars, whereas a navigation errors can destroy the ship. "We have an over reliance on electronic aids. People like a screen in front of them," he said. "That attitude continues when they become young officers."

He was cynical about bridge team management courses. "We have institutions who call anything and everything bridge team management. A lot of people don't know what it means," he said.

He also raised concerns about the reliability of pilots. "People get promoted to pilot too quickly," he said.

On Element 6 - Cargo and Ballast Operations / Mooring Operations, Chawla said that deck offices do not study this very much. "I think there's a major training issue here," he said, "particularly with an influx of dry cargo people moving to the tanker industry."

Element 7, Management of Change, is the "most difficult part in my life," he said. "In an organisation with 1,000 people - getting changes done is a major concern. Documenting changes is a requirement. People don't like the paperwork associated with it. Last year we had 19 ships in and out of management. This year we already have 11 or 12."

On Element 8, Incident Analysis and Investigation, he thought that people need more training in root cause analysis. There is a tendency for people to blame surface issues rather than causal issues. "My experience - people say - that guy was stupid, he's been told to be more careful," he said. "Very rarely do you get a lack of supervision, or lack of procedures cited as a root cause. It is still a struggle to arrange for reporting of near accidents. And watch out for creative reports."

"We started with 90 near miss reports a year, now we get 2,000. We get 10%, 20% increase per year," he said. "But there are a lot of reasons people don't report near misses. They think it will work against them."

The industry has a problem with its lack of sharing of accident statistics, he said. "For the last 10 years in Hong Kong, I have tried to get co-operation on reporting to the IMO subcommittee. I have not succeeded."

"When there are accidents I don't see any reason for not sharing what went wrong. If MAIB is doing investigating it will be on the internet in 6 months time."

Chawla said that he is unhappy about the focus oil companies put on lost time injuries. The emphasis should be on altering the behaviour which potentially leads to injuries, rather than whether or not an injury actually caused lost time. "For example a chief cook puts his fingers in a rotating dough machine to see the dough is done. It can happen - his hand gets caught in the machine and breaks it," he said.

"The industry focuses on lost time injuries, as though LTIs was a criminal act. The only thing you can tell is who is honestly reporting accidents," he said.

On the topic of risk assessment, (Element 9), Chawla said that the quality of risk assessment varying a great deal with seafarers from different parts of the world, because they have different perceptions of what a risk is. However the risk assessment element of TMSA is similar to ISM.

As for environmental management (Element 10), he said "I don't think most of us have a problem, we're ISO 14000 compliant. The problem is continuous improvement beyond regulatory compliance."

And of emergency preparedness (Element 11), the challenge is stopping safety drills from getting monotonous. "How many times can you do a drill with the same people?" he asked.

On Element 12 - measurement, analysis and improvement, Chawla noted, "You need to find a torch bearer in senior management. You need someone to keep pushing the issues slowly and diplomatically.

"I keep a notebook of changes I'm looking for," he said.

The most important elements are Element 1 (commitment), Element 3 (crew shortage) and Element 12 (analysis), he said.

"The pressure is keeping all these programs running all the time without losing track," he said. "For example, if seafarers' allotment to his wife does not reach her in time, there goes your motivation and he'll moan about 10 other things."

"My conclusion - TMSA will deliver results but on the long term. TMSA has a stronger chance than ISM of delivering changes, because it is commercially driven. But it will take time."

"It must be a motivation tool, not compliance or retribution stick. The quality system must be a living process at the core of the business."

On the issue of how oil companies use TMSA, Chawla said he did not think oil companies would ever say, 'if you're not a 3 you're not going to get a charter'. He also did not think they would ever reduce the vetting inspections. "But they will have a better idea about the company and the ships," he said.

"They are all saying we want to try out TMSA - let's see. BP seems to be ahead in the steps in using TMSA to their advantage. But it all depends on which auditor you get."

On the issue of getting the most out of individuals, Chawla said that it was important for people to know how they are going to be judged, what the expectations are. "The trick is to be able to bring the person back with your team, get that person mentally to play in the team," he said.
Matthew Hodkinson, group safety manager, with ASP Shipmanagement, Melbourne, said that the objectives with TMSA were to address imbalances in implementation of the ISM code, and provide tools to help companies develop improvement plans.

ASP found that it was at level three and four in lots of areas, but weak at the level one and two questions. But out of the 250 questions in TMSA, there were only 22 which it could not say yes to.

Areas ASP has had a special look at, after going through the TMSA document, include management and accountability, risk assessment, management of change and incident analysis.

"We left environment management because we felt we did not have control over that. We subsequently looked at it and decided there were things we could do," he said.

On the near miss reporting, ASP aims to get 10 near miss reports per vessel per month as an initial target. It uses a BP format form, with a spiral pad of forms which is provided to each crew member. The severity of the near miss is ranked from negligible to catastrophic. "Ships crews are very keen to use it," he said.

On the topic of lost time injuries, Mr Hodkinson said he agreed with Chawla that data about lost time injuries is not particularly agreed with Chawla that data about lost time injuries is not particularly immeasurable," he said.

A level where they are essentially helpful. "They have come down to lost time injuries is not particularly immeasurable," he said.

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Hodkinson showed a graph (see image, below) of seafarer stress levels during vessel unloading, showing that while the stress goes up and down, the seafarers' ability to handle the stress declines at an increasing rate, until eventually the stress is too much.

To help follow the TMSA guidelines, ASP decided to revamp its IT systems, including maintenance, ship shore reporting and accounting. It chose the STAR IPS software.

While Shell decided to put administrative officers on board its vessels, ASP decided to try to reduce the number of administrative tasks which need completing onboard.

"We want to meet safety demands and improve efficiency with improved maintenance and condition control; improved follow up of accidents and incidents; improved inventory control; management and control of the purchase order process; more precise ship-shore communication; and a single point of data entry onboard," he said.

ASP's customers have a secure client login to the software, and they can login to see accident reports, information about performance and safety.

"Perhaps the most important benefit from these systems is that it makes the seagoing staff and integral part of the management team," he said.

Hodkinson talked about the company's experience so far with oil major auditors.

BP disagreed with ASP's TMSA assessment on a number of sections, but for undergoing itself as well as overscoring. "On a few areas we marked ourselves high and BP tore us to bits. In other areas we marked ourselves low and BP said we were doing quite well," he said.

ExxonMobil is using TMSA as a format for auditing the companies. "This undermines the self in self-assessment," he said.

Surprisingly, Shell does not use TMSA as an audit format. "They found it 'too vague' and they moved away," he said. "They consider it the owners' tool. They've moved to 'management review - owners guidelines.'"

Patrick Slesinger, director and chief information officer with Wallem Group, emphasised the importance of approaching TMSA thoroughly - as opposed to trying to 'comply'.

Many tanker companies are under competitive pressures to achieve a certain score. But if they just focus on the score, they are not going to get improvement, he said. "We need to make sure compliance doesn't get in the way of the need to change."

"It is about cultural change and continuous improvement. We're talking about ways of doing business and different reporting standards. Best practise is not a paper exercise," he said.

Companies which just aim to comply with TMSA, but don't use it as a tool to improve their company's operations, will just increase their costs, he pointed out. Do it properly, and you will get immediate internal value.

An example of how you can cause problems for yourself by taking a compliance attitude is the planned maintenance systems, which many tanker companies implemented poorly, in a rush and on the cheap, he said.

A common trick was to copy the maintenance database from one vessel to another, rather than put together a database for each specific vessel, with the data becoming less relevant and accurate with each copy.

Because of this many companies have poor parts data in their maintenance databases and because of this, they were not able to use part numbers from their maintenance databases in their electronic purchasing system, which would have saved a lot of trouble.

Slesinger emphasised that a good tanker company can quickly lose favour with an oil company, and its 'approved' status, if it is caught lying on its TMSA submission.

He emphasised the importance of keeping the data which is used to generate the TMSA score. "We have to be able to re-use the information for process improvement," he said.

Slesinger was critical of lost time injuries as a useful key performance indicator, because if someone has an injury before they go on leave, it doesn't get counted. "People can say 'he wasn't supposed to be working next week anyway, it's not a LTI.' We're going to see a spiral of self-defeating matrices," he said.

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