TANKEROperator

JUNE 2007

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Front cover photo *- All eyes are turning North, due to the estimated 25% undiscovered energy reserves thought to lie within the Arctic Circle. Class societies, shipowners, oil companies, engineering concerns and others are seeking ways of coping with the severe weather conditions found in the area. We have already seen what Primorsk and other Baltic loading terminals have done for the ice class tanker market. However, new technology will be needed to cope with conditions in the Barents Sea and beyond. Photo credit StenaBulk.*

A German take on climate change

TankerOperator's Comment page is given over to GL as the German class society has tried to look another 140 years ahead, following the celebration of its anniversary this year.

This year, German class society Germanischer Lloyd is celebrating its 140th anniversary having been founded in Hamburg on March 16, 1867. However, instead of looking back, the class society has tried to come up with a scenario for the year 2147, although admitting this was not an easy task.

The result of this project was a book called *Technological horizons - and the sea.* GL's Dr Hermann Klein said the forecast was based on what we know now. "We know that the global population is growing. We are aware of the growth of the developing economies. One driver of this development is low transport costs", he said.

"We are aware that the climate is changing. And that we still miss a global organisation able to cope with problems on a global scale", Klein said.

By 2031, the world population will have grown by 1.8 bill. This will lead to a chain reaction in respect of energy demand and seaborne transportation. More goods will travel more miles by sea.

Global warming - if not stopped in time - will have opened up the North-East Passage by 2070 (or earlier) to merchant shipping in the summer months without the need for ice breakers. This will shorten the sea route from Asia to Western Europe by some 4,000 nautical miles.

"Conversely, global warming requires us to minimise emissions of carbon dioxide as much as possible. What are the alternatives?" Klein asked.

The potential of renewable energies is enormous. All renewable energy sources provide 3,078 times the current global energy needs, according to Greenpeace. Just how quickly renewable energies will take over from the black gold is heavily dependant on the price of oil and technological developments in the energy industry.

Dr Hermann Klein has joined the distillate brigade.

In the transport sector - one of the heaviest oil consumers - new fossil fuel-free concepts will be competitive because of the price shift.

Nuclear energy might well make a comeback in the transport sector. Nuclear powered ships could be the norm in 140 years' time.

Ships move over 90% of the world's raw materials, foodstuffs and finished goods at costs far lower than any other transport mode. They do so with the lowest energy consumption and also lowest emissions per unit of cargo carried. The large diesels powering most ocean-going tonnage are easily the most efficient internal combustion engines ever developed.

Nevertheless, he said that SO_2 emissions have to be addressed. Some - like port authorities, Intertanko and just recently the German transport minister - ask for even more. Last week at the European Union maritime conference in Bremen, Germany's transport minister Wolfgang Tiefensee announced that he will press for a sharp reduction in the use of heavy bunker fuels in shipping.

Tiefensee and GL have joined the distillate camp.

Switching to marine diesel will have a marked effect on transportation costs. The current public pressure will give the shipping industry a chance to show how to develop new approaches.

And that is the place for a classification society. It should undertake research, to consult and advise customers and authorities on technical, environmental friendly solutions.

Klein gave an example of solutions to new international regulations citing the case of the first sulphur emission control area (SECA), which was introduced in the Baltic Sea. GL developed a new service for vessels entering and leaving the SECA on a regular basis.

GL published a 'fuel change-over manual', which gives the crew simple tables for determining the conversion time and the expected consumption as well as the necessary documentation for the authorities.

Klein thought that new fuel-efficient designs not only save money since lower emissions will be a competitive advantage winning business from blue-chip clients. Even the propeller design and stator fins, as well as the quality of the coating have an impact on the fuel bill.

Other examples include routine maintenance, such as cleaning the underside of the hull and propellers can knock thousands of dollars off fuel bills as the removal of sediment greatly reduces resistance. It may even be possible to save money and conserve the environment at the same time.

All things being equal, lowered fuel consumption will reduce all emissions and therefore contribute to a cleaner environment. Fleet size, vessel type, engine configurations, maintenance requirements, fuel procurement arrangements and operational routines are among the factors that will determine the complexity and duration of a fuel management programme. TO

See you at NorShipping 2007
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First Class tankers: a new perspective

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Inchcape celebrates

Inchcape Shipping Services (ISS) has won the right to handle the fleet of Italian oil major Eni. The contract is for a period of three years.

ISS formed a joint venture in Italy-ISS Tositti - who will handle Eni's fleet of aframax and handysize tankers, which carry both crude and products.

The agency expects to handle around 500-600 port calls per year from its hub in Venice. The main regions of activity for ISS-Tositti will be the Mediterranean, excluding Italy, the Black Sea and West Africa.

This is the third contract won by the joint venture in three months and follows agreements with Synergas and Vistamar.

The service concept in Italy comprises of four cornerstones: -

- The hub in Venice, which is a single reference point to liaise with the principal on all requirements.
- ISS' international experience and reputation.
- Some of the most sophisticated web-based applications in the market, such as YourISS and the ISS Disbursement Management System.
- Common culture, language and time zone.

Since the joint venture was formed in Venice at the beginning of 2005, new offices have been opened in Augusta, Trieste/ Monfalcone and more recently Savona/Vado. Soon to follow will be the Sicilian port of Milazzo, Sarroch, Porto Torres and Porto Vesme on Sardinia.

By the end of the year, ISS-Tositti will have 11 offices and will cover 50% of all Italian ports. The organisation handled 1,800 port calls in Italy in 2006, making the concern the largest ships' agent in Italy.

In the tanker sector, ISS already represents BP, ExxonMobil, Maersk Tankers and Shell worldwide and recently signed up Nigeria LNG for local US calls.

Meanwhile, CEO Claus Hyldager reported revenue of $310.5 mill for the whole group for 2006 and said the target was to hit $560.8 mill by 2010. To help achieve this, some $3 mill has been spent on expanding the commercial team, business development, strengthening certain services and beefing up the operations/QA/ HSSE.

On the commercial side, $1.8 mill of the total has been allocated to local resources in China, Brazil, Australia and Italy, plus the building up of global partnerships and specialist commodity teams.

Another partnership was recently formed with Russian energy interest Prisco to look after operations at Sakhalin while ISS already looks after ExxonMobil's tankers at De Kastri. In Argentina, ISS now has representation in all the main ports and will set up a Chinese joint venture later this year. Syria and Vietnam are other areas either invested in or being watched closely.

Development and support functions on a 24/7 basis has been moved to India.

Last year in total, ISS accounted for 55,000 port calls and hopes to break the magic 60,000 barrier this year. Hyldager said that the long term target was to gain 10% market share and be able to handle 1.3 mill port calls. "We aim to buy into areas where we are not already in," he explained. TO

Ship operations - the future

Worries concerning how the shipping industry and the seafarer in particular will adapt to the world's increasing technological advances are the subject of a series of books to be published by the Nautical Institute (NI).

The first in an initial five book series entitled 'Maritime Futures' was published in April and covers the communications sector, in particular the IT boom. The book called *Waves of Change* addresses the modern communications age by discussing methods of dragging shipping into the 21st century.

The NI was concerned about how modern vessels will be operated in the future, the nature of the equipment to be used and how shipping will integrate more closely into transport networks and logistics chains, which are the subjects covered in the first book. To make this transition, access to information will be required and also the ability to process it much more efficiently, Captain Cooper, NI's president said at the book launch.

Capt Cooper then tried to put this in perspective by saying that Germany, France and South Korea have recently announced that they are going to invest in communications networks, which will enable transmissions of up to 100 megabytes per second.

By contrast the shipping industry is congratulating itself on having reached a broadband transmission rate of just 500 kilobytes per second. This means that shipping will soon be 200 times slower than comparable networks ashore.

He qualified this by saying; "as a shipmaster, I am not certain that I want or need instant communications. I am finding it hard enough to cope with the workload I have at the moment, but that is to accept that improved communications simply brings more of the same."

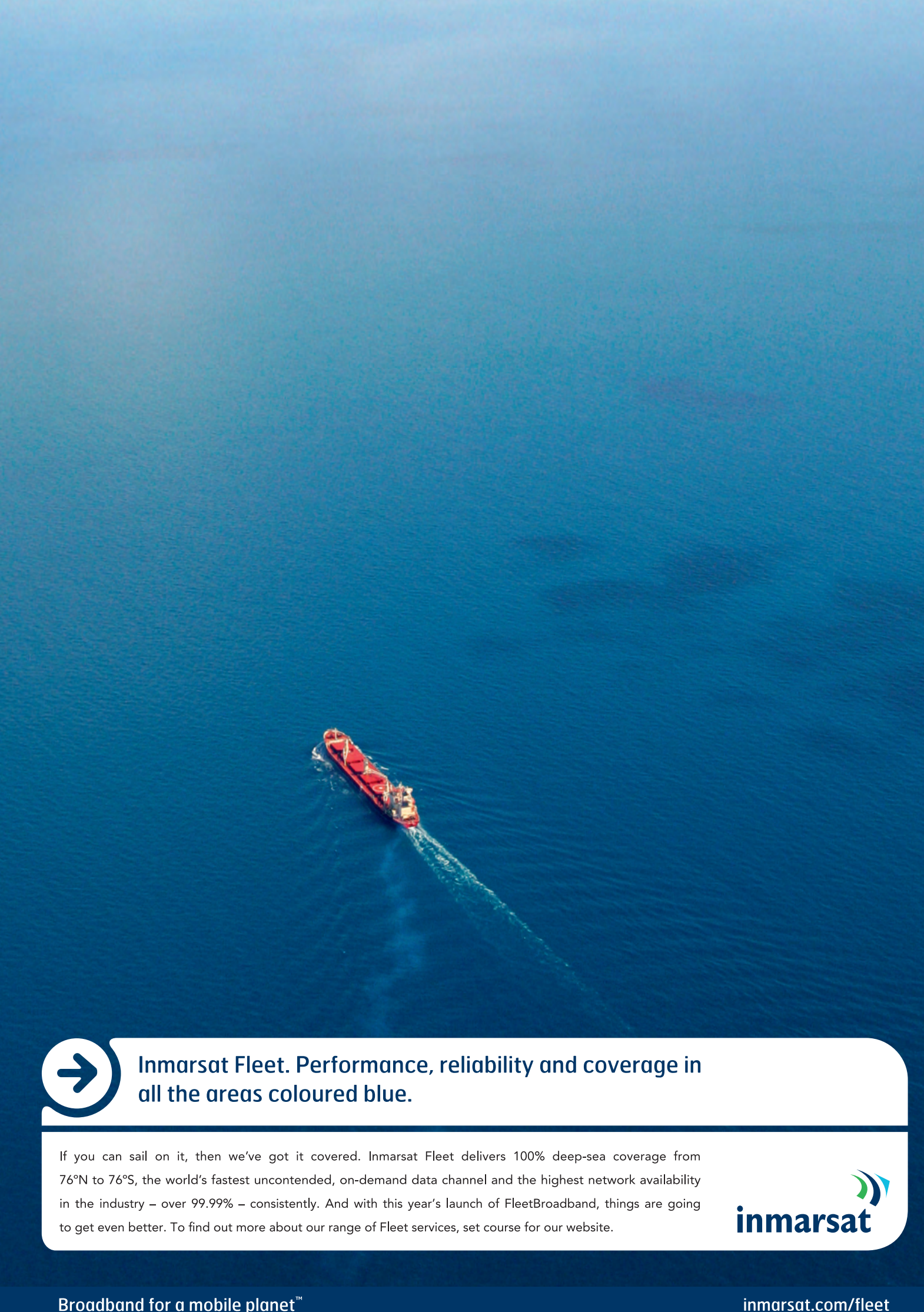
He said that much of his work is concerned with ship administration, e-mails, reports, schedules, stores, crew matters, cargo, drydocking, bunkers, victuals, voyage accounts and so on. Then there is all the port documentation, crew lists, quarantine clearance, berth allocation, immigration, customs clearance, stores, crew changes, and of course security reports. All this is being processed before the cargo is considered.

"If I am honest, most of the information processing done on board ship could be handled without senior officer intervention on a routine basis. We would of course have to have a suitably well designed information system with links and access to data sources with answers to all our most frequently asked questions available on the ship's web at the click of a mouse, " Capt Cooper said.

"Reporting in for navigation and security, something of a nightmare for my colleagues trading to the US where evidence of the previous 10 ports traded to is now required on their 90-hour pre-arrival notification, should not need ship intervention at all. Everybody knows the rules so why is the system not pre-programmed to follow them?" he asked.

He advised those reading *Waves of Change* to think that the horizon is already overhead and not some way in the distance. "A modern trading floor in the City of London is light years ahead of shipping. If I pick up a message from this book it is now time that shipping started to move with the times."

***Waves of Change* by Dr John Robinson is published by The Nautical Institute, 296 pp, softback, price £19.25 to NI members, or £27.50 for non-members, plus postage.** TO



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Effective designs of 'ships of the future'

Aker Yards, Rolls Royce Marine and DNV are joining forces with the Norwegian University of Science and Technology (NTNU) in Trondheim. The intention is to build an international powerhouse for research and education on "The effective design of ships for the future".

The maritime industry is facing and will face new expectations. The focus on areas such as environmental performance and on board working conditions has increased and will continue to increase in the years to come. By establishing a core research and knowledge team at NTNU, this industry will be better prepared to meet these new challenges, the triumvirate said.

NTNU is currently advertising for five graduate engineers and two post doctorate positions to establish a core research and knowledge team. This team will be complemented by 10-15 students with MSc degrees.

This grouping will, together with the existing and very strong research and educational environment at NTNU, focus on the effective design of ships for the future. The end-user needs will change and new designs must not only meet what is actually expected of them, but also exceed this in order to prepare the vessels for a long life.

Production friendliness and design effectiveness are other key words for the team. The first is meant to ensure state-of-the-art technologies and processes are introduced to enhance quality and cost-effective production. The second, design effectiveness will achieve the same when it comes to design technology and the design process itself.

Tor Svensen, the chief operating officer of DNV Maritime, said: "This group of Norwegian companies have achieved a high degree of international success and today enjoy a strong market position in our respective businesses. Through this initiative we intend to further strengthen our position by attracting the most competent people and building the knowledge and process to enhance the ability of Norwegian-based maritime companies to compete internationally."

Through this initiative, Aker Yards, Rolls Royce Marine and DNV will support NTNU by providing funding, active involvement in factual cases and close co-operation between the research and education environment and the industry partners. TO

New training centre

Wärtsilä Land & Sea Academy (WLSA) has opened a new training centre in Jisa, near Pusan in South Korea.

Wärtsilä and Hyundai have formed a joint venture company named Wärtsilä Hyundai Engine Company to manufacture Wärtsilä 50DF dual-fuel medium speed engines to power large LNG carriers.

The new WLSA centre is purpose-built to provide training primarily for Wärtsilä RT-flex low-speed engines and Wärtsilä 50DF medium-speed engines for customers' engineers, shipyard staff, the licensed manufacturers and classification society surveyors.

When fully operational early in 2008, the centre will be able to train some 500 to 600 people per year. TO

GL on the up

Despite problems fighting possible mergers and takeovers, last year Germanischer Lloyd (GL) recorded the highest sales revenue in the company's history. It was also the best gross operating performance in any financial year.

The sales revenue of the GL Group (the German stock corporation (GL AG) and the other 83 consolidated group companies) showed a rise of Eur46.1 mill (+14.5%) on the previous year reaching Eur364.4 mill. Maritime services generated 75.8 % while 24.2 % came from industrial services.

After deduction of taxes on income, the highest ever consolidated profit of Eur45.2 mill was recorded for the financial year 2006, compared with 2005's Eur20.4 mill.

GL's strong orderbook remained on balance virtually unchanged, which GL claimed was remarkable given the high volume of deliveries. During the year, orders for classification of seagoing tonnage remained around the previous year's high level, reaching a new record by topping the 20 mill gt mark at the end of November 2006.

The volume of orders received for newbuilding classification of oceangoing vessels amounted to 10.3 mill gt last year, the second-highest figure in a reporting year. The total of around 8.8 mill gt of new vessels completed in 2006 was the largest annual volume delivered in the history of GL.

Total orders for classification of new seagoing tonnage at the end of 2006, aggregating 1,204 ships of 19.9 mill gt, showed an increase of 1.6 mill gt (8.4%) on the beginning of the year, or as much as 20.4% in terms of value.

Both the number and the tonnage of new vessels reached new record levels at the end of 2006.

GL has responded to the continuing rapid growth of the economic environment in both the maritime and industrial sectors by stepping up human resources at home and abroad.

The number of employees working for GL worldwide - including limited-term contracts and temporary workers - increased by 312 (around 11%) (previous year + 15%) to reach 3,241 by the end of last year.

Thus total personnel numbers - and also the number of permanent employees - topped the 3,000 mark in 2006 for the first time.

To cope with the existing volume of orders for newbuilding classification, GL said that it intends to make further increases in the network of locations in Asia in 2007. In view of the high level of orders and the fact that the capacity in the newbuilding classification sector is therefore fully booked until the end of 2008, GL expects to be able to maintain its growth strategy in the medium term.

GL's in service fleet as of May this year included 177 product and chemical tankers and 88 gas carriers, while the orderbook contained 54 product and chemical tankers, plus 16 gas carriers.

TO

In the 2007 Annual Review, we take a look at two vital areas that will focus the minds of shipping people for many years to come - safety and the human element - through the eyes of experts. We start with an analysis of the future of SOLAS.

Is it the end for SOLAS?

"So long, SOLAS": Some are beginning to see what they believe are gaps opening up between safety and environmental regulations while others point to design innovations that were not conceived when SOLAS was drafted. So is it time to re-write SOLAS, asks Andreas Chrysostomou, chairman IMO Marine Environmental Protection Committee?*

The SOLAS Convention in its successive forms is generally regarded as the most important of all international treaties concerning the safety of merchant ships. The first version was adopted in 1914, in response to the *Titanic* disaster, the second in 1929, the third in 1948, and the fourth in 1960.

The 1960 convention was the IMO's first major task after the organisation's creation and it represented a considerable step forward in modernising regulations and in keeping pace with technical developments in the shipping industry.

Periodic amendments were meant to keep the convention up to date but in practice the procedure proved to be very slow. It became clear that it would be impossible to secure the entry into force of amendments within a reasonable period of time.

As a result, a completely new convention was adopted in 1974, which included not only the amendments agreed up until that date but also a new amendment procedure - the tacit acceptance procedure - designed to ensure that changes could be made within a specified (and acceptably short) period of time.

Instead of requiring that an amendment shall enter into force after being accepted by, for example, two thirds of the parties, the new procedure provided that an amendment will enter into force on a specified date unless, before that date, objections to the amendment are received from an agreed number of parties.

As a result, the 1974 convention has been updated and amended on numerous occasions. The convention in force today is sometimes referred to as SOLAS, 1974, as amended.

Although this version included a speedier legal way to introduce amendments to the annexes of the convention, its major principles philosophy and approach remain the same as those drafted in 1974. Unlike the 1978 International Convention of the Standards of Training and Watchkeeping (STCW) that had undergone a holistic review in 2005, SOLAS has only been amended partially.

In addition to this, many in the industry identified gaps between safety and environmental regulation, which are not properly addressed by SOLAS as its initial version did not cater for them.

Following the historic evolution of SOLAS one can easily trace that technological advancement and innovation can be incorporated within the convention in a faster manner due to the tacit amendment procedure that has been incorporated in 1974. In other words amendments to the convention to catch up with the technological advancement do not become obsolete by the time they are in force, due to the reality of slow paced ratification.

Furthermore, the convention provides for retrospective application of new amendments to existing ships, although its main principle is that new amendments shall apply to new ships, there is the possibility to apply it to existing ships if the parties to the convention wish to do so.

In essence it can be concluded that SOLAS provides all the necessary tools for an evolutionary process on a continuous basis without having to create a new convention, due to technological changes or needs for further regulation due to advancements in the need of maritime trade.

Notwithstanding the legalistic aspects, SOLAS is not the only convention dealing with maritime affairs anymore. The proliferation of state governance in all aspects of shipping, such as the environmental protection, have fragmented the shipping regulatory framework and has created a number of conventions dealing with all aspects of shipping that sometimes create confusion and in other cases create gaps regarding safety between certain types of vessels.

It is therefore, very pertinent for one to ask whether the existing SOLAS as amended over time addresses all the various issues that the modern maritime society requires and whether there are gaps between safety and environmental issues. For example, the need to stop the transfer of unwanted organisms from one place to another in the ship's ballast water, led to the use of water ballast exchange as one of the methods to avoid the transfer of these organisms,

which in many instances could have serious adverse effects on ship safety.

As mentioned, SOLAS has been redrafted several times in order to achieve higher standards of safety through the years to avoid gaps in safety and environmental issues, as well addressing the needs for different types of ships, a new SOLAS might be a way forward to address this. Perhaps, now that we are in the 21st century, we should not have several international conventions dealing with different aspects of shipping, or different types of ships.

A new consolidated convention might be more appropriate, an international convention that will absorb the provisions of all the aspects of SOLAS, MARPOL, etc and been catalogued by type of ship. In such a way, one could find all relevant provisions for a specific type of vessel under the same convention and he or she would not have to search in different conventions to find the relevant provisions. On the other hand, all conflicts or gaps could be identified easier and addressed instantly.

The consolidation of all provisions under the same international instrument would provide several advantages and solutions to existing problems as follows:

1. All provisions will be under the same instrument and it could then be possible to include provisions for implementation audits in a mandatory form.
2. All provisions of a specific ship type will be addressed under the same regime, ensuring consistent expertise participation in the evolution and redrafting of these provisions.
3. The goal based approach could be easier to introduce due to the specificity of each part of the new instrument.
4. New innovative designs will be more easily introduced as new ship types and their regulatory regime will only have to be within the same boundaries of the other types and there will be no need to try to mould these in accordance to those of existing ship types.
5. Safety and environmental regulations will be able to sit in harmony since from the outset they will be developed in accordance to a specific ship design.
6. Investigations into all serious casualties would be more focused and the findings would be more easily addressed and dealt with, because there will be no need to go to different diplomatic conferences where the state parties might not be the same and their national interests and priorities might not be in line to those of another diplomatic conference.

Such a process is long and time consuming, but the end result should be worth the time and the effort.

In conclusion, whether it is time to re-write SOLAS, the answer shall be "yes", but is it necessary to re-write SOLAS once more even if this time there would not be a new version of the convention but a full revision of it, under the tacit amendment procedure? The answer here most probably should be "no". Each ship should be addressed under a common instrument, which will include all relevant aspects regulating that ship type spanning from safety of life at sea to the protection of the marine environment. TO

This was taken from a paper presented at LR Fairplay's SASMEX conference and exhibition held in Brighton during April.

SASMEX will return to the UK South Coast resort in April 2008.

Best practice in the human element

While some success in managing the human element can be achieved by addressing it on an issue-by-issue basis, the effects of such campaigns are often limited in scope and duration.

It is far better to address issues in a balanced fashion, aiming for overall benefits. Before they can do this, however, tanker operators need a true picture of how well they are currently doing. A new service from Lloyd's Register (LR) intends to provide that picture, explained LR's principal human element specialist Dr Jonathan Earthy*.

LR's Jonathan Earthy

Costs may arise from not properly addressing the human element. These may be hard costs (inefficient operation, damage and compensation) or soft costs (poor retention, low experience factor and lost opportunity). The costs of not addressing the human element are particularly pronounced in the tanker sector, where the consequences of human error, such as accidents and pollution, are simply not tolerated.

For the tanker industry to continue to meet the rigorous external demands placed on it, the human element must be properly addressed. Unfortunately, it is far too easy for operators to pick (or consultants to offer) the first 'human factors' tool or method that comes to hand, rather than finding an approach that will help in an area where each organisation is likely to have specific and probably unique problems. Such randomness will not only be wasteful; it will also permanently damage the reputation of the techniques and sciences that can help to address the problem.

LR intends to assist operators in becoming informed buyers of the tools and methods most suitable for them and in implementing suitable techniques to manage human element issues.

Best practice guide

Building on its support of The Nautical Institute's award-winning *Alert!* campaign to raise awareness of the human element, LR is releasing *The Human Element: Best Practice for Ship Operators ('the Guide')*, designed to aid the transition from awareness to effective action.

The content of the Guide is derived from a number of sources, not least the articles and centre-spreads in *Alert!* itself. For ease of use the Guide uses the structure and methodology adopted in OCIMF's Tanker Management Self-Assessment (TMSA) guide.

Centring on humans

Integration of the human element into an organisation does not happen on its own. Management practices need to be adapted so that they identify and address human element issues, not only during operation but also during the design and construction of the ship. The Guide promotes continuous improvement towards a structure for full consideration of the human element. The principles are:

- Continuous improvement, learning from experience, trials and prototypes.
- Early, continuing, effective crew input.
- The matching of people and tasks to ships and systems.
- Teamwork and co-operation between stakeholders.

A human-centred approach supports the development of a safety culture, and helps the crew to act as a safety barrier (rather than being seen simply as a

BIG SMOOTHY

Euronav, one of the world's leading independent crude oil tanker companies, has selected the HEMPASIL silicone-based fouling release coating system for *TI Asia*.

TI Asia is an ULCC of 441,000 tonnes deadweight – one of the largest double-hulled crude carriers in the world.

"Minimising maintenance as well as maintaining a smooth hull during the entire service period is vital for efficient operation of our vessels, and a silicone fouling release product helps us to achieve this", says Paul Moeyaert, General Manager, Euronav Ship Management. "We also believe that the smoother topcoat should give us a reduction in fuel consumption and therefore reduce carbon emissions. This will also help us reduce the amount of biocides released into the sea, making our operations even more environmentally friendly."

Hempel provides fouling control solutions to shipowners, operators and shipyards throughout the world. The technology behind Hempel solutions ensures rapid, cost-effective workflows during application and attractive cost profiles during operation.

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Figure 1, The areas of best practice in addressing the human element

source of human error). It also improves job satisfaction, which leads to better staff recruitment and retention, as well as encouraging safer operations overall.

Areas covered (Figure 1)

The practices of the company at a corporate and strategic level:

- Management commitment to the human element.
- Integrating the management and use of human element data.
- Integrating the human element into concept and strategy.

What the company management does about the human-system issues on a day-to-day basis:

- Gathering and using crew input and feedback.
- Integrating the human element into value for money decisions.
- Integrating the human element into trade-off decisions and risk management.

Addressing human-system issues in each stage in the lifecycle:

- Current operations, in-service ships.
- Starting an operation.
- Repair and modification.
- Laying up or selling on.
- Design and build.

Technical activities for:

- Human resources.
- Human-centred design.

Four levels

The Guide defines four levels of achievement. The first level is to identify the relevant issues, review them and plan what action to take. The second level is to seek out these issues and act upon the data gathered. Third, the company should develop a managed programme of work to consider the human element and, at the highest level, it should be able to make informed trade-offs between topics such as manning, automation and operations.

Interaction

The Guide provides a basis for Human Element Gap Analysis (HEGA) (see Figure 2). This discovers strengths and weaknesses in the management of the human element, highlighting shortfalls against best practice. It identifies areas for improvement and prioritises them in an action plan. Suggested improvements might take the form of training and awareness raising, changes to procedures or changes to company structure and communications.

In order to cater for all types of organisation, HEGA supports a range of assessment approaches, from formal audit to informal self-assessment. Whatever approach is taken the result is advice on the range of detailed technical services available, including those from LR.

Changes for the better

The Guide is designed to help tanker operators to improve consideration of the human element by changing the orientation and scope of their management practices in a staged manner. The change in orientation encourages greater emphasis on identifying human element issues and then acting upon them. The change in scope helps ensure that human element issues are integrated into the way that existing practices are carried out. TO

Jonathan Earthy is LR's principal human factors specialist and co-ordinates all technical aspects of LR's treatment of the human element and its involvement with IMO, IEC and ISO on this issue.

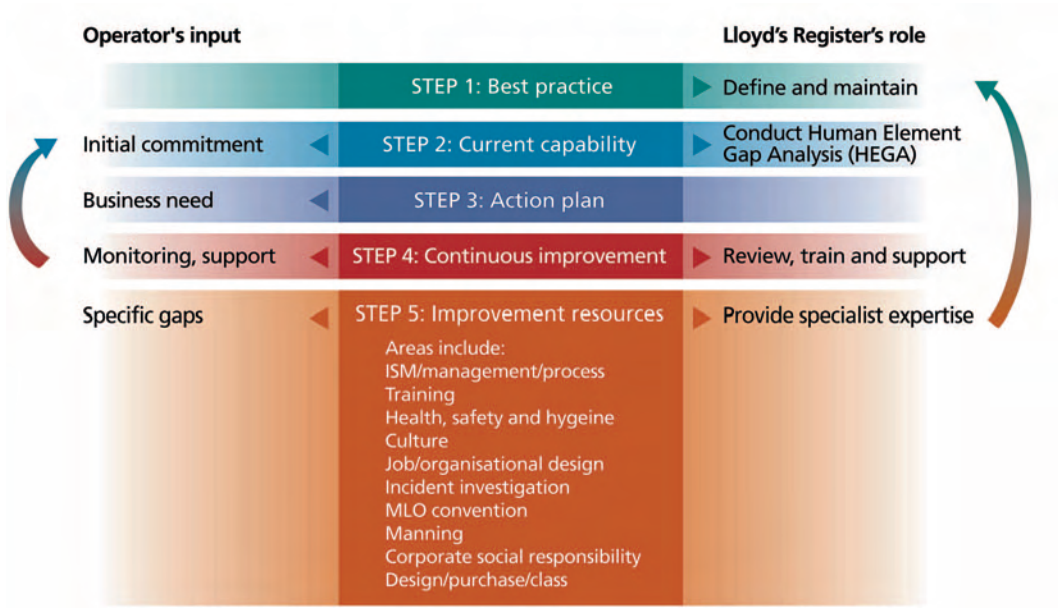

Figure 2, The HEGA continuous improvement cycle

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Criminalisation in the spotlight

One of the major impediments to tanker officer recruitment was the effect of the criminalisation of maritime accidents, Tom Allen Vela Internationals' commercial manager said*.

Allen said that is was obviously imperative to prevent and correct accidents. Safety is something that is directly connected to the security of ships. "It suffers for one primary reason - the increasing trend towards the criminalisation of accidents, regardless of the facts."

"Unless we, as senior managers in our tanker industry act to change that mind set, regulators will increasingly seek only to punish those involved in an accident, rather than determine the cause. If we always seek to punish, we will drive away the talented individuals that we need to keep our ships secure," Allen said.

He stated that the tanker industry had improved dramatically, yet the public and media have zero tolerance for any oil spill. Since 1979, there has been a marked drop in both the number and severity of oil spills.

According to Allen, Vela's annual target is zero spills. There have been less than four barrels spilled in the last five years, while delivering over a billion barrels of oil. Six gallons were the result of a burst hydraulic hose on a crane, which squirted some oil overboard.

Allen pointed out that the central problem facing the industry is that accidents are treated as if they are crimes. Only those that commit gross negligence or commit wilful acts are subject to criminality. "But is that really the history of our recent accidents?" asked Allen.

He added that both the masters of the *Prestige* and *Erika* were held in jail without trial for many months and asked if other captains could expect the same. Allen said that the answer was maybe, with regards to detention and possible criminal proceedings. In the meantime, the livelihoods of these men will be destroyed beyond the commercial realities of their mistakes. As Allen asked the audience, "Yes mistakes - but a criminal act?"

He asked what reasonable captain would question a class certificate of seaworthiness on his vessel, in the absence of evidence to the contrary? Who is really to blame? Allen said he would suggest that so long as we punish the accident victims, all we do is lessen the quality of the men that will remain in the business.

Allen thought that the problem would make it more difficult to attract qualified young people to sea. "We add Detention to the three Ds - dirty, dangerous, difficult, that already make our industry a hard sell to new candidates," he said. That in turn will also impact on security as well. "Can we really expect the same man that we treat with suspicion at every flag state/port state inspection to act as a responsible member of a security team for enforcement of the ISPS code?" asked Allen.

His speech detailed what the industry has done to seafarers that have had to suffer through accidents. They have one thing in common - a chain of errors that, had any one error been corrected - nothing would have happened. He pointed out that instead the industry is witnessing owners and their insurers increasingly reluctant to authorise remedial actions. Allen observed that too often laws are used to prosecute people for purposes other than what they were intended. For example, Allen stated that in the US, laws on the statute books (Refuse Act of 1899 and Migratory Bird Treaty Act of 1918) for over 100 years are being used to criminalise mariners. Yet neither law was incorporated into OPA 90.

To add insult to injury, Allen noted that the US Coast Guard's environmental directive says - 'company officers and employees could be convicted and sentenced criminally even where they took all reasonable precautions to avoid the discharge.'

Allen stated that he believed the USCG was on the side of the industry but that the quote -'the decision to commit necessary Coast Guard resources to obtain evidence that will support a criminal prosecution must often be made in the very early stages of a pollution event', which was attributed to a former USCG Commandant, will forever be taken out of context.

He went on to praise the USCG commitment to improving safety, yet they are the ones often tasked with the investigation and the

Assigning blame will not solve the problem – Tom Allen.

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gathering the evidence for the prosecution. Allen noted that the USCG has confirmed that its policy on criminal prosecution is reserved for the most flagrant cases and where traditional ideas of a crime have occurred.

Allen said that it was not the USCG's intention to arrest an offender. The problem is that they are effectively creating the grounds for such an arrest in the course of responding to an incident because, as they must obtain criminal evidence very early in their investigation. As a result, they get forced to participate as a matter of law. According to Allen, in the US, that law requires that the Justice Department and state enforcement agencies might get involved directly with the investigation without the USCG or National Transportation Safety Board's recommendation.

He said that this creates a real dilemma for seafarers. He or she has to co-operate per OPA 90's mandate or follow the lawyer's advice to avoid self-incrimination. He added that a seafarer should be protected against self-incrimination in much the same way as other people are accused of misdemeanours.

While such protection is available to some extent in the US and certain other countries, Allen noted that the courts in those countries have yet to rule on the issue of whether seafarers' rights against self-incrimination trumps the obligation to co-operate fully in an oil spill investigation. As a result, concluded Allen, the seafarers have been placed in a sort of "no man's land," where they are expected to make a judgement with regard to co-operation versus self-incrimination and possible jail. This is not acceptable, Allen said.

He also warned that the threat of criminal liability negatively affects transportation safety, plus hinders accident investigation and oil spill response. Accident investigation and reporting are critical to every safety programme to prevent re-occurence and to show knowledge and lessons learned. As a result, investigations cannot be properly carried out or documented as they will be used in evidence against seafarers.

Allen asked the critical question, who is to blame?

- Port states refuse entry to damaged ships?
- Class societies who issue certificates of inspection to some vessels that they should not?
- Insurance companies that try to limit claims rather than encourage a good response?
- Charterers that insist on integrity and then drive the hardest bargain in sharp trading?
- Owners that defer all responsibility to the master, flag, class, or someone else while they wave certificates of seaworthiness?

Assigning blame will not solve the problem, said Allen.

But he did suggest the following answers -

1) Owners instruct masters to accept LOF on their own authority when they deem it necessary - this is the single best protection afforded.
2) P&I clubs and ITOPF must focus more on -
   A - Action rather than protection from liability.
   B - And prevention and drills.
3) Owners must take responsibility, not shift blame to crews.
4) Port states must allow ports of refuge.

Shipping leaders must support and encourage national regulators, the EU, as well as the IMO to adopt the following summarised recent recommendation from the recent MARE conference.

- Acts of simple negligence will not be subject to criminal prosecution no matter the circumstances or severity of the casualty or pollution.
- Unintentional, or inadvertent violations of regulations not resulting in casualty or pollution will not be subject to prosecution.
- Wilful violations of regulations or accepted industry codes may be subject to criminal prosecution for a lesser charge, if they could have but did not contribute to a marine casualty or oil pollution.
- Only wilful violations or gross negligence causing or directly leading to a marine casualty or oil pollution should be subject to criminal prosecution.
- Port states must be given the same rights to ships' crews as they do to their own citizens. Or implement an International Seafarer Bill of Rights, which is long overdue. Arrest and detention of seafarers without an immediate hearing, filing of formal criminal charges, or permitting release on bail, must cease. TO

Tom Allen presented his paper at the TANKEROperator conference held in Dubai in April.

Cadet berth availability survey

Intertanko's Human Element in Shipping Committee (HEiSC) is also promoting careers at sea among the younger generation.

A key element is the staff supply and the shortage of seafarers in general, but an important aspect of this is the difficulty of securing cabin space on board ships for cadets.

As a priority item Intertanko said it was undertaking various initiatives to try and increase the supply of competent manpower within the industry.

At Intertanko's Council meeting held in November last year, it was agreed that to increase the number of qualified competent officers at sea and to safeguard the tanker industry of the future, its members agreed to consider that, as part of a planned programme for officer training, they will commit to enlisting apprentice officers (cadets), for each vessel operated, where suitable certified cabin space exists on board to accommodate them, and where it is possible, to acquire young capable apprentice officers of a suitably qualified nature.

Also recognising the trend in today's shipyards of constructing vessels with less accommodation, Intertanko members further agreed to consider that newbuildings should include suitable certified cabin space for cadets as part of any newbuilding specification. Intertanko also said that it would endeavour in parallel to ensure that the Tripartite Forum (owners, shipbuilders and class) would include cadet berth availability in their work programme with the aim that classification societies make cadet berths a mandatory requirement in standard ship design.

As part of the initiative, Intertanko asked its members to respond to a confidential survey to determine the present situation of cadet berth availability. TO

Greeks in the ascendancy

Greeks operate more shipping tonnage than any other national group, reports David Glass.

The Greeks are also the world's largest tanker owning community. That the Greek tanker fraternity has invested a massive amount of cash transforming their tanker fleet into one of the industry's more modern, is also an accepted fact.

A very successful IPO – Aegean's ceo Nick Tavlarios. Photo credit Barry Parker

However, the depth of this transformation is perhaps less well-known. The diversity of the energy carrying fleet and the determination of all players to move forward sees Greeks now operating a predominantly double-hull tanker fleet of an average age of just over nine years, and by the week the fleet is getting younger as more newbuildings are commissioned.

A survey released in March by the London-based Greece Shipping Co-operation Committee revealed the average age of the Greek-flag energy fleet, in carrying capacity terms, is less than five years for oil tankers, is 3.3 years for chemical and product tankers and less than one year for gas carriers. Indeed, the survey reveals 25% of the world's tankers under five years are run by Greek interests.

Further, the Greek fleet now contains modern ships trading in every sector of the business. According to the GSCC's survey, which is based on data provided by LR/Fairplay, Greek owners control 24% of the fleet of crude oil carriers and have inked 23% of the contracts for new ships. They own 9.6% of the world's chemical and product tankers and are responsible for 15% of the orderbook and 12.5% of ships under five years old.

Greece's three largest shipowners are all prominent tankermen - John Angelicoussis/Kristen Navigation/Maran Gas Maritime; the Tsakos group/TEN/Tsakos Shipping & Trading; and George Procopiou/Dynacom/DynaGas. They have also been at the forefront of fleet renewal and diversification.

Improving image

The determination on the part of Greek owners to polish their image has also influenced their outlook. Today, Greece's tankermen are no longer bent on maintaining their privacy. Quite the contrary, they are keen to be seen to be doing the right thing.

Transparency is in vogue. There is a realisation among Greek operators that the industry's changing trading and commercial environments demand it.

Further, as independent operators, owners have come to accept their progress depends on setting an example and the best way to do this is to lead from the front.

Manning, training and modern maintenance systems top the agenda and the Greeks are willing, some say too willing, to let their views be known on these issues.

A recent example of how tanker operators are adapting to today's conditions was the pre-Christmas 2006 launch of a $200 mill IPO on the New York Stock Exchange by bunkering-ship operator Aegean Marine Petroleum. The Dimitris Melisanidis-led Aegean sold 12.5 mill shares to achieve gross proceeds of $175 mill and totalled just over $201 mill when underwriters exercised the take up of shares in over-allotments.

> "Further, as independent operators, owners have come to accept their progress depends on setting an example and the best way to do this is to lead from the front."

No doubt Aegean got off to a flyer because the bosses of US-listed tanker group General Maritime (GenMar), Peter Georgiopoulos and his righthand man John Tavlarios, were already on board, having committed to a 25% stake in the offering by expansion-minded Aegean. A big chunk of the funds raised will go underwriting a newbuilding programme involving up to 30 purpose-designed bunker tankers, which Athens-based Aegean intends to operate globally.

Another example of how some of Greece's lesser-known lights are moving with the times is Omega Navigation Enterprises (ONE). In spring 2006, the Antonis Comninos-backed company grossed $204 mill in a Nasdaq IPO and also commenced trading on the Singapore exchange, as a secondary listing. Omega said it would use the funds to purchase tonnage already earmarked and kicked-off with a fleet of six product carriers and two bulk carriers. It also had an option to buy four 1A ice class 74,200dwt product tanker newbuildings ordered by Comninos' Target Marine and which were slated for delivery within a couple of months. When placed, this order marked a major hedge for Comninos and Target, traditionally an operator of reefer and container ships.

The two moderm supramax bulkers were quickly disposed of for some $82 mill and today ONE is the only pure player in the product tanker sector listed in the US. ONE has said it believes the fundamentals are strong in the products sector relative to other shipping sectors and plans to continue its business strategy of expanding its double hull product tanker fleet through selective and accretive vessel acquisitions.

Drybulk to energy

Comninos is not the only member of Greece's drybulk fraternity to look to oil and gas to fuel future progress. Beside Angelicoussis and his drybulk operation Anangel Marine Services [24 bulkers of 3.25 mill dwt], Greece's other large bulk carrier operators, the Victor Restis-led group [50 bulkers], Diamantis Diamantides of Marmaras Navigation [41 bulkers] and George Economou of Cardiff Marine and US-listed DryShip [42 bulkers] have also turned to the energy sector and launched extensive newbuilding programmes.

And of course there is Gabriel 'Villy' Panayiotides who not only heads up US-listed bulk carrier operation Excel Maritime Carriers, but also controls some 50% of Copenhagen-listed Torm which has teamed up with Teekay Shipping to buy and split US suezmax and products-tanker owner OMI in a deal worth $2.2 bill.

Panayiotides' controlled Beltest Shipping is Torm's largest shareholder with a stake of just over 32%, while his sister-in-law, Eirini Nomikou, is linked to 20% stakeholder, Menfield Navigation.

Panayiotides had made a move to open the way into direct tanker shipping by sponsoring the 'blank cheque' vehicle Oceanaut, which raised some $161 mill in a successful IPO on the New York exchange in March. Panayiotides chairs the new company which has the goal to acquire "vessels or one or more operating businesses in the shipping industry". Oceanaut is being presented as offering Excel an opportunity to diversify outside of the drybulk sector with the investment to be identified within 18 months of the IPO's closing.

While, Citigroup's John Kartsonas and his fellow analysts see a difficult year ahead for tanker operators, predicting an oversupply due to the unseasonably weaker winter will be felt, Greece's tankermen remain optimistic as the bulging orderbook testifies, though in first quarter 2007 drybulk ships were being ordered in greater numbers than energy ships. TO

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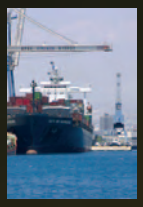

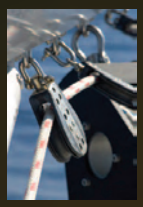

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Norway - a change of direction?

It seems that every time that Norwegian shipping comes up in conversation, the government is about to produce a 'white paper' amid threats from Norwegian shipping heavyweights to quit Norway.

As we approach Nor-Shipping once again, there doesn't seem to much change in that scenario. The Norwegian shipping fraternity through their proactive **Norwegian Shipowners' Association (NSA)** are still pushing for reforms to the existing tonnage tax system, originally introduced in 1996.

Basically, the previous government looked at the issue but decided nothing or very little could be done and preserved the *status quo*. Then came a change in government in 2005, which led to the Storting having a majority leadership for the first time for a couple of decades. The electorate voted in a three-party centre left working coalition to power, ousting the Conservatives.

A report that was published in March last year did nothing to appease Norwegian shipowners, who said that it produced nothing of note.

The new Minister of Trade and Industry, Dag Terje Andersen, has gone on the record as saying that shipping is one of five key areas under the spotlight and that a national maritime strategy is being worked upon, which should be ready for unveiling later this year.

However, several of Norway's leading shipping companies are sceptical that anything positive will come out of it, even though the government seemed to have taken a more pragmatic view. They say that being a coalition, things will take longer to get done as there will inevitably be dissenting voices within the three parties in power.

A meeting between the shipping community and the government was held last February in the wake of at least one Norwegian major upping sticks for Cyprus. Even John Fredriksen has finally renounced his Norwegian passport in favour of a Cypriot one. However, he does have a history of this, so not too much should be read into it.

One thing is certain that if the tonnage tax is reformed on the lines of say the UK, investment would immediately follow. Norway still boasts some of the most active banks and finance houses involved in the marine industry in the world.

Norwegians have always been in the vanguard of new technology, illustrated by the build up of the offshore industry in the late 1960s. The NSA recently called for a 0% emissions policy and the government has backed Intertanko's controversial distillate fuel solution to reduce emissions. The use of fuel cells on board ship and LNG powered ships are either already in operation or close to coming to fruition along the Norwegian coast.

In January of this year, the Norwegian government introduced a NOx tax, which has not gone down well with everybody as it has proved unpopular with coastal operators.

As of 1st January this year, Norwegian owners controlled 1,774 vessels of 40 mill dwt. Chemical tankers amounted to 302 vessels of 6.7 mill dwt, gas ships (Both LNG and LPG) totalled 136 vessels of 3.9 mill dwt, while other oil tankers amounted to 87 ships of 7.3 mill dwt. FPSOs and storage vessels totalled another 53 of 6 mill dwt.

Interestingly, the world's newbuilding orderbook show that Norwegian concerns have 35 gas ships, 61 chemical tankers and 17 other oil tankers either on order or under construction. In total, the number of Norwegian-controlled vessels on order is at its highest level for some time, due mainly to the booming offshore support market.

The current president of the NSA is tankerman Trygve Seglem of Knutsen OAS Shipping, while other tankermen sitting on the committee include Herbjorn Hansen of Nordic American Tankers (NATS) and Anne Jorunn Mokster of Simon Mokster.

Northern Lights

There is a distinct change happening in Norwegian policy towards transport. Instead of looking South, the Norwegians are now starting to look North. Think tanks, the government and the maritime cluster are developing ideas to transport oil and gas from what is known as the 'Far North', or 'High North'.

Technology developed since the heady days in the North Sea of the 1960s and 1970s is being further developed to cope with the severe conditions encountered north in the Arctic regions, such as the Norwegian, Barents, Kara, Pechora and other seas surrounding the Norwegian and Russian Arctic.

Shipping is expected to grow by 50% in the Barents Sea/Murmansk area alone and if the proposed shoreside pipelines and loading terminals are built, then the amount of tonnage using the area could quadruple. There are already claims that around 30% of the world's vessels will be ice class by 2030.

Local Murmansk government and port officials told *TANKEROperator* that tonnage in the region could increase to 150 mill to 180 mill tonnes per year, compared with today's 29 mill tonnes per year. Since 1996, the Port of Murmansk's turnover has increased by 4% per annum.

The goal is to remove all naval sites and wrecks in Kola Bay and to bring Russian ports up to international requirements, including the installation of VTS systems. At present, there are no requirements to have VTS systems between Russian ports.

The port officials also said that the Murmansk/Kola Bay region was ideal for transhipments. A study of Murmansk as a transportation hub is due to be completed this summer. As for Murmansk port, some $2 bill could be required to upgrade the facilities, but officials thought this figure could be on the conservative side.

Bi-lateral talks are ongoing at both national and local government level and by companies from Statoil and Gazprom downwards on how to

exploit the rich energy resources in the Arctic region. It is estimated that 25% of the world's undiscovered resources lie in the Arctic. There are thought to be substantial oil reserves in East Greenland, for example, while the giant Shtokman field has only just started to be explored and developed.

While on a visit to Murmansk, *TANKEROperator* was told that there were at least 15 known oil and gas deposits in the Barents and Kara Seas alone.

Gunnar Sander, programme manager Arctic environment at the European Environmentally Agency said at a meeting in Oslo in April that the Norwegian government had delivered an important contribution to the future sustainable use of marine resources through its management plan for the Barents Sea.

The Russians have sent out strong signals that they wish to have a common approach to the Barents Sea, based on what they learned from Norway's experience and bi-lateral projects have begun.

Sander said that this approach could be an important learning curve for the EU when discussing the marine directive as the basic principles are the same.

The Norwegians are currently chairing the Arctic Council for six years. The secretariat sits in Tromsoe. They have put forward an integrated marine management system as one of the first priorities. Norway is currently the world's third largest oil producer and has pledged to supply Europe should problems arise in the stability of Russian supplies.

Statoil, backed by the Norwegian government, is set to significantly increase its presence northwards into the Barents Sea and will become a major producer in the region by expanding its offshore investment.

Norwegian think tank **ECON** is to publish a report - The Future to 2030 in Arctic Shipping - during a conference coinciding with Nor-Shipping. It is now accepted that global warming is affecting the Arctic region twice as fast as the average elsewhere.

Although possibly opening up new trade routes in the 'Far North' other factors to be taken into account in shipping terms include increasing ice movement and increasing wave action due to the loss of ice cover, ECON's Bjorn Brunstad said.

The worst case scenario is that the area could virtually become ice free by 2040, making the Arctic a much more dangerous place to navigate. There is the possibility of an East/West trade route across the North Pole, which would almost halve the distance from Germany to Japan, but it would be only open to smaller vessels.

NSA's Marianne Lie explained that the Northern Sea route from Severnaya Zemlya to the Barents Sea would be restricted by draft to vessels of around 20,000-25,000 dwt. Ships would also be expensive to build and operate as they would only sail for five to six months per year on the route.

NSA's Marianne Lie warned of draft restrictions on some potential Arctic routes.

Lie thought that the route was unlikely to influence world trade in the short term. However, smaller vessels were likely to trade between Siberia and the White Sea and transhipments points had already been set up at Murmansk in a joint venture between Rosneft and BW Shipping. It was likely that the cabotage trade would be restricted to Russian flag vessels only, Lie thought.

ECON's scenario specialist Brunstad estimated that oil and gas exports from Russia could increase by 50% with much of it going by sea from Arctic ports

having been piped or trucked from the inland oil fields.

He warned of possible sovereignty disputes as the ice melts. For example, he said; "Would the Northern Passage be territorial waters, or not"? He also predicted that the Continental shelves would be extended right to the North Pole.

ECON's Bjorn Brunstad said oil and gas exports from Russia could increase by 50%.

The Norwegians are already bringing in a ships' routeing scheme for large vessels sailing around the northern tip of Norway to and from ports such as Murmansk, Kirkenes, Narvik and the Snohvit LNG loading terminal just outside Hammerfest.

Vessels with hazardous cargoes will be told to sail 30 miles off the coast from 1st June with a three mile safety zone between the north and south lanes. It will run from the Russian border to the Lofoten Islands.

Most of Russia's oil exports are expected to go by sea meaning tankers will sail within Norway's 200-mile Economic Exclusion Zone. The Norwegian administration and the Coast Guard are setting up strategic bases for rescue craft, including tugs along the length of the huge coastline. The whole 600-mile area will be supervised from a traffic control centre at Vardoe, near the Russian border.

However, warnings were given by some experts who said the Norwegian administration could not cope with a 100,000 tonne oil spill as the coastline was too long and remote. Also the administrators were lacking about NOK200 mill worth of cleanup equipment.

Thus far, no technology exists today to handle an oil spill in ice. The opposition saw oil transport as a bigger threat to the environment than exploration and production.

However, the IMO approved the Norwegian traffic scheme last January at a meeting in Istanbul.

Research organisation SINTEF together with Statoil is studying the effect of pollution in ice conditions at research stations in Trondheim and Murmansk. SINTEF keeps an oil sample from every vessel leaving Murmansk.

Norway's State Secretary, Ministry of Foreign Affairs, Ms Liv Monica Bargem Stubholt, said logistics needed to be developed between the triangle of the US, Norway and Russia as there was very little east/west border infrastructure, either offshore or onshore.

An ice melting project will be unveiled next year and an update to the 2004 Arctic Climate Assessment Impact is underway. She was keen to stress that the whole Arctic problem is scientifically driven and not politically motivated, despite a dispute over an offshore area going on for more than 30 years.

Norway's oil major **Statoil** confirmed that it is still talking with the Russians, including Gazprom, about becoming involved with the giant Shtokman oil and gas field and other projects. Although an exploration and production partnership seemed to be out of the question, technology transfer could be the way forward, as the Russians do not have the engineering experience of the Norwegians, which is based on almost 40 years of exploration and production in the hostile North and Norwegian Seas.

In the late 1960s, the Norwegians developed the North Sea from virtually nothing to spawn a whole new industry without any expertise from the oil companies or government.

Statoil outlined five reasons for the company's involvement in the Arctic region.

1) The Arctic, especially the Barents Sea, is the new leading offshore oil and gas region in Europe.
2) It will play a significant role in the supply of energy to Europe and the US.
3) The LNG potential will create an Atlantic gas market.
4) Both the Norwegians and Russians are increasing industrial activity in the area, which will help local people prosper.
5) Statoil is already the leading industrial architect of the North.

The oil major also added that the reserves were believed be four times those of the North Sea and that the Arctic region is much closer to the European and US markets than other areas under exploration.

One example of activity within the Arctic Circle is the Snohvit LNG loading terminal, the first phase of which is nearing completion on the island of Melkoya, just outside Hammerfest. A trial shipment has already taken place bringing in LNG to fill the tanks, while the first exports are due to start in August or September of this year. The terminal will be fed from four fields in the Norwegian Sea and should double in capacity by 2014. The whole project started in 2002, however, it was discovered in 1982, but laid dormant for over 10 years.

The first cargo was shipped on Hoegh LNGs *Arctic Princess* in very rough weather. The cargo was used to commission the storage tanks. To help with berthing and unberthing operations, four tractor tugs were commissioned for the terminal.

This summer, a decision will be taken whether to develop the terminal for oil exports. The ship loading jetty, arms and storage tanks are already geared for condensate and LPG, as well as LNG exports. Each cargo will be handled using separate loading arms on the single jetty.

In the short term four LNGCs will be needed calling at Snohvit once every five or six days, while an eight ship shuttle is envisaged in the longer term. LPG and condensate cargoes could be handled once every three to four days.

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Pipeline

Meanwhile, it has been decided that the LNG shipments from the first phase of Shtokman will be by pipeline to Germany. This operation could be ready to start pumping gas by 2014. Exploration in the area surrounding this field could yield a second phase by 2020 and a third in 2030, or beyond. One of other of these phases could include shipments by sea of LNG and/or oil.

To cope with the severe conditions, Statoil said there were four options to deal with the ice conditions in the Far North:

1) Avoid the ice by using subsea systems, thus avoiding the use of platforms.
2) Manage the ice in shallow waters.
3) Design ships to operate in ice of 2-3 m thick.
4) Environmental concerns.

The Russians realise that they need to develop energy to serve their domestic needs, as well as for export. Gazprom is now being built up to the size of an ExxonMobil, but the internal pipeline system is now old and the capacity is taken up in winter and production is declining.

Tank testing

Consultant **MARINTEK**, part of the SINTEF group of companies, has completed and is still undergoing a lot of work on connection with LNG and oil handling in the Far North.

The Trondheim-based consultancy has already run model tests on Qatar's Ras Laffan loading terminal to see if it could cope with three large LNGCs per day. At the other end of the scale, MARINTEK has looked into the Kystgass project, which involves transporting small parcels of LNG along the Norwegian coast in 5,000 cu m lots, such as seen with the *Pioneer Knutsen.*

Two routes were studied:-

A) Northern route to the Trondheim Fjord.
B) Southern route to Oslofjord.

MARINTEK said that two 5,000 cu m capacity vessels per route would give an increased system robustness.

For vessel propulsion, the consultants said that the cost could be compared with diesel oil if the LNG was shipped by sea. MARINTEK claimed that a price equivalent of around $200 per tonne was feasible.

In five or 10 years, a lot of LNG could be transported by sea along the coast of Norway and indeed all over Europe and Scandinavia. The Norwegians already operate LNG powered ferries and offshore supply vessels.

MARINTEK also found that there was a lack of Metocean data for ship-to-ship transfers and offshore loading.

For ice conditions, the data should include:

1) Significant wave height.
2) Level ice thickness.
3) Rafted ice thickness.
4) Ice ridges.
a) Sail height.
b) Keel depth.
c) Consolidated layer.
5) Density of ridges.
6) Icebergs.
7) Water temperature.

Model tests have also been conducted on Hi-load LNGCs with regasification plants, such as those just chartered by Exmar to Petrobras for offshore operations. Tank tests were also carried out with Hi-load LNGCs and offshore regasification terminals.

Testing was also undertaken of LNG terminals sited in shallow waters and simulating berthing procedures with tug assistance.

Oil tanker ship-to-ship transfers are now undertaken off Kirkenes operated by Tschudi subsidiary Kirkenes Transit. The Norwegian government has restricted such operations to fjords where there were no salmon running in the fjords. MARINTEK looked into the emergency response plans for such operations and also for the case of a drifting fully laden tanker off the northern Norwegian coast in winter. Thus far, the ship-to-ship transfer volumes are small as only about one operation takes place per month.

The Norwegian Coast Guard claimed that it had emergency towing vessels (ETVs) along the coast, despite the concerns of some politicians that not enough was being done to prevent an environmental disaster. A spokesman said the traffic is being analysed and that all tankers leaving the Murmansk area must report to the Norwegian authorities. The VTS system and control centre at Vardoe is controlled by the Norwegian Maritime Directorate.

Ballast Water

In another move, Norway has implemented the IMO's Ballast Convention, a move that was welcomed by Intertanko.

The country has passed national legislation, which will ensure that the IMO's International Convention for the Control and Management for Ships' Ballast Water will be implemented for ships entering Norwegian waters by the end of this year. This move was taken in conjunction with Norway's formal ratification of the IMO's Ballast Water Convention.

As per the Convention's requirements, Norway intends to implement national regulations, which will require ships to undertake ballast water exchange by the end of 2007. Ships will therefore be required to undertake ballast water exchange at least 200 nautical miles from the nearest land and in water depths of at least 200 m as per the IMO guidelines.

As well as treatment, all ships must also ensure the full implementation of a ballast water management plan, which includes the ballast water record book.

Intertanko said that it

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welcomed Norway's stance as a positive sign that the Convention can be implemented effectively by individual states without the need for developing their own separate and differing requirements.

Since the adoption of the Convention in 2004, a number of states and regions have proposed, developed and implemented requirements, which are at best loosely based on the IMO Convention, the independent tanker organisation said.

Intertanko had previously voiced its concern relating to the proliferation of regional requirements, which differ from those in the IMO's Convention. With this move by Norway, Intertanko said that it hoped that other states wishing to develop and implement ballast requirements for shipping will revert to using the already developed international standards.

Ironically, Intertanko said that it had noted that many of the states considering the implementation of national requirements, which differ greatly from the IMO Convention were those that have actively participated in the Convention's development since 1993.

Norway joins some eight other states, which have already ratified the Convention, namely Croatia, the Maldives, Nigeria, Poland, St Kitts and Nevis, Spain, Syria and Tuvalu. The Convention will only enter into force after it has been ratified by more than 30 states, the combined merchant fleets of which constitute not less than 35% of the gross tonnage of the world's merchant shipping.

DNV's sound performance

Norwegian class society **DNV** reported a growth in revenue of 16% last year from its core activities.

The global focus on risk and zero tolerance for accidents resulted in significant demand for DNV's services for managing risk. The 2006 financial figures show that the company achieved a revenue of NOK7,297 mill ($1,132 mill) last year, producing an operating profit of NOK794 mill ($123 mill). The profit after tax came to NOK546 mill ($85 mill).

"A sound financial foundation is required to secure the independence and integrity of DNV's operations," said CEO Henrik Madsen. "It is gratifying that our positive performance and growth comes during a period when DNV has been especially active in its work to make a positive impact on our customers' business globally, while safely and responsibly improving their business. This demonstrates that we have customers who value quality highly, and that our services add value."

The strong growth in the world economy, with a high level of activity in most industries, has resulted in "good financial performance and a long-term order reserve," said Madsen.

"Following the adoption of a new strategy in June 2006, the past year laid emphasis on shaping and growing the DNV organisation. The business areas have been restructured to reflect a clearer focus, and we recruited 1,000 new professionals to gear up for the growth required to meet the targets in our strategy," explained Madsen

Within the field of ship classification, DNV's share of the world fleet measured in gross tonnes is approximately 16%. Of the newbuildings contracted during 2006, DNV's share of the world market was 26% when measured in gt, representing 605 ships. A record total of 5,228 trading vessels, aggregating 113.5 mill gt, was classed by DNV at year-end.

The demand for risk-related technology and management services has also been high in the oil and gas industries, providing DNV with "exciting projects on all continents," said Madsen. "The North Sea is still the most important area in terms of business revenue, while strong growth is seen in Brazil, North America, India and China. Great opportunities are also opening up in the Barents Sea," he added.

DNV's Henrik Madsen reported a 16% growth in revenues.

DNV is among the world's three largest companies within accredited quality management system certification, and a world leader in environmental management system certification, Madsen claimed. He pointed out that there is a clear trend towards more industry-specific certification schemes, which will increase the need for a deep understanding of the various industries.

"As an example, DNV plays an active role in making the emission trading mechanism of the Kyoto Protocol become operational. Services where DNV has a strong international position include validation of projects for emission reduction and verification of actual emission reductions in specific projects," He explained.

Looking ahead, Madsen believed that the demand for DNV's services will continue to be high in 2007. "This is based on the assumption of a vibrant world economy, continuously high oil prices and a high level of activity in all our main markets. The order reserve is very satisfactory at the start of this year for all business areas, and we expect sound growth in revenues in 2007."

Ice problems

As Madsen pointed out, DNV is heavily involved with the mangement of risk in the Far North's ice conditions.

DNV's co-ordinator of the class society's maritime Arctic initiatives is Morten Mejlaender-Larsen. He said that there were 211 ice class tanker on order at the end of last year of 12,000 dwt

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Profit and loss account (Mill NOK)	2006	2005	2004
Revenue	7,297	6,683	5,945
Operating profit	794	750	483
Financial items	31	49	-51
Tax	-280	-271	-209
Profit for the year	546	528	223

Source: DNV

or over. DNV already classes 380 ice class tankers and has 70% of the world's tankers to Ice Class 1A*, 55% of 1A, 65% of 1B and near enough 100% of class 1C vessels.

He explained that in the Barents Sea the ice is normally around 1.2 m thick and the temperature will go down to minus 30 deg C. In the Kara Sea the situation worsens still further with ice of up to 2 m thick and temperatures of below minus 40 deg C. By comparison in the Baltic the ice is normally around 1 m thick in low temperatures of minus 15 deg C.

DNV is the only class society offering winterised and DEICE notations. IACS has already produced its Polar Rules, while DNV is writing its own set of rules, which should be published in July 2008.

Basically, Arctic research is split into five areas: -

1) Human response.
2) Emergency evacuation - there are no good solutions available for the safe evacuation in ice conditions.
3) Extreme ice features.
4) Assessment of safe and effective ship operations in ice conditions.
5) Arctic environment emergency situation.

Areas to be considered in vessel limitations in ice conditions were listed as:-

1) Ice strengthening of hull structure and rudder.
2) Strength of propeller and shaft units.
3) Vessel size limitations.
4) Increased need for engine output.
5) Not possible to optimise for both open and ice covered waters.
6) Special designed vessel for specific trades.

One project - Ice Load Monitoring - is being researched over a two year period. The goal is to provide the bridge team with information on ice loads on the hull, which would help reduce damage, reduce repair costs and give other advantages. An icemap is also being worked on that would be overlayed on an ECDIS.

In march of this year, a two week voyage in the Barents Sea was taken as a benchmark for the icemap to see if forecasting was feasible by noticing the changes every few days on an electronic chart.

The partners in this project are C-Map, Light Structures, Meteorological Institute at Tromsoe, Norwegian Coast Guard, Statoil and Teekay.

As for the human element, which is no less important, Meljaender-Larsen said that the areas that need to be taken into account should include working in very low temperatures, 24 hours of darkness and the problems with noise and vibration in ice.

No risk-no reward

Serving an industry characterised by the emergence of new and more complex risk, marine insurers are under significant pressure to adapt quickly to meet the evolving demands of their customers.

To succeed, marine insurers cannot afford to be reactive - they must take the initiative to develop the tools to manage the new market reality, warned the **Norwegian Central Union of Marine Underwriters (CEFOR).**

The rapid growth of the global shipping industry has created many new and complex challenges. The expanding world fleet has resulted in a shortage of skilled officers and crew, while increased global demand for transportation has left shipowners with fewer opportunities to take vessels off-hire for running repairs and deterred many from retiring older tonnage. At the same time, new maritime and environmental regulations have raised penalties for violations, while the impact of the industry's embrace of new technologies has yet to be determined.

The Scandinavian marine insurance market has long been recognised for its expertise and ability to adapt quickly to change, but the scope and pace of today's changes are new and present a significant challenge to the marine insurers. While it is too early to draw any definite conclusions regarding the 2006 underwriting year, results based on the actual claims figures (including IBNR estimates), indicate a loss ratio of 107%. This figure may represent a trend towards higher partial claims, which will result in an even higher expected loss ratio.

From 1997 to 2005, Hull & Machinery recorded continuous technical losses. In the period

Morten Meljaender-Larsen – DNV's ice expert.

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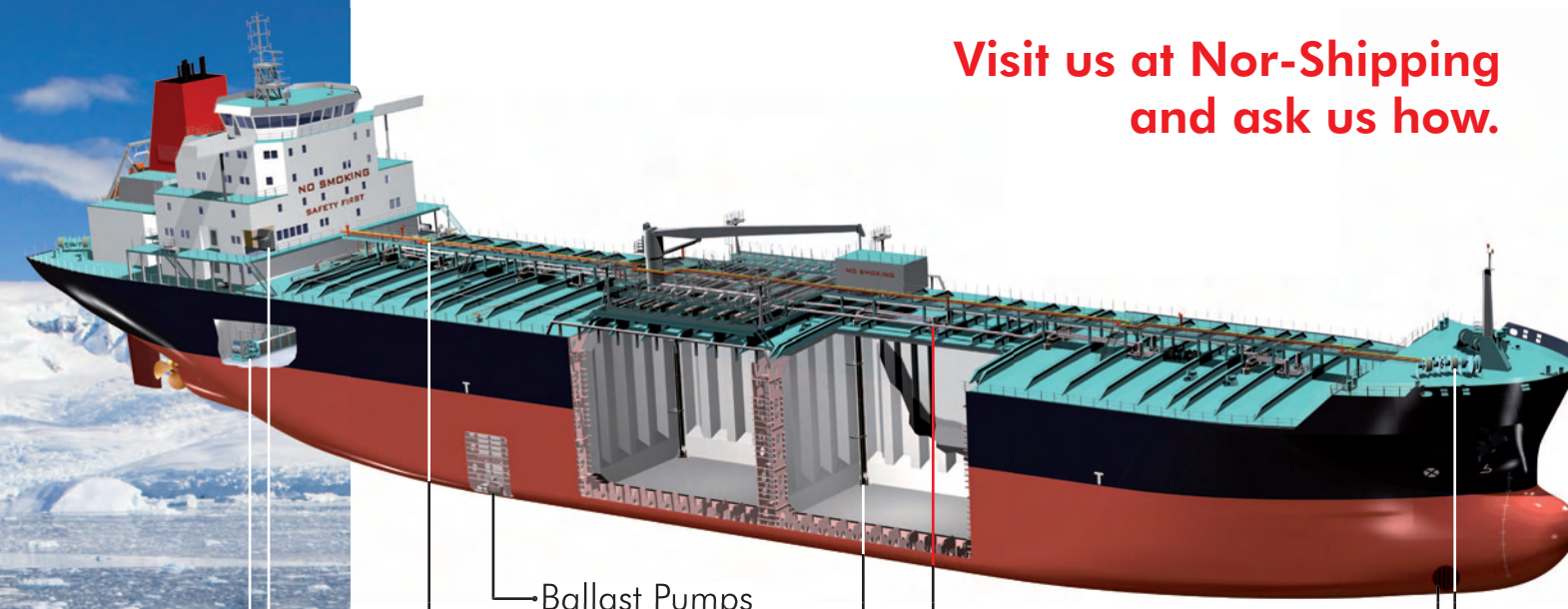

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> While the changing picture of risk will encourage marine insurers to adapt - and adapt quickly - it should be noted that marine insurance is all about how to correctly identify, analyse, value and transfer marine risks.

2001-2003, high-profile events (the largest claims accounted for 10-12% of the total) had a significant impact on results reported by CEFOR, but the 2004 and 2005 underwriting years share none of the characteristics of the years before. Indeed, the largest claims in 2004 and 2005 only account for 4-5% of the total. The 2006 underwriting year is still developing, but currently the largest claim accounts for 10% of the total registered claims.

CEFOR statistics also show a significant increase in the average claim size. Average cost per incurred claim has gone from a relatively stable $200,000 to approximately $300,000 for 2004 and 2005. For 2006, the average is likely to change as the year develops. In addition, the claim per vessel reported by the end of the year is higher than the 12-month status of any previous year. Claims between $10-30 mill showed a dramatic increase and for the first time in it's history, an engine claim larger than $10 mill was recorded.

Nautical related claims continue to be a major concern within the insurance industry. The probability of an incident becoming a major claim seems greater than before, while the expansion of the world fleet, combined with low scrapping rates, has resulted in a lack of qualified seafarers. Although the frequency of claims has fallen slightly, costs continue to rise, driven by the scarcity of yard capacity, increasing raw material and labour, growing cargo values and the high price of oil. Worldwide, shipyards are operating at full capacity. The waiting time for repairs is often several months and prices have increased considerably. As a result, the cost of Hull & Machinery and Loss of Hire claims has increased, often resulting in heavily damaged vessels being declared total losses.

While the changing picture of risk will encourage marine insurers to adapt - and adapt quickly - it should be noted that marine insurance is all about how to correctly identify, analyse, value and transfer marine risks. The business is built around not avoiding risk, but to deal professionally with the risks underwriters and their clients face at any given time. As an industry, the underwriters are capable of assessing risks and taking them on. Indeed, the ability to define what may happen in the future, assess associated risks and uncertainties, and choose among alternatives lies at the heart of any risk management system.

By understanding risk, measuring and weighing its consequences, risk-taking has become one of the prime catalysts that drive modern society. CEFOR members' development and constant progress is fundamentally based on their ability to understand and properly handle risk. Risk is not something to be feared, but rather, represents potential and opportunity for growth and prosperity, CEFOR said. TO

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Nor-Shipping 2007 - a sell out

This maritime event week (12th-15th June) has grown steadily in both size and significance and this year 41 countries have taken stands and some 85 countries will be represented at Lillestrom.

As of April, there were 731 exhibitors. New to Nor-Shipping are the national pavilions of Romania, Vietnam and Italy. Other countries, such as India and Turkey, have increased their presence, Nor-Shipping's director Tollef Schiander said.

Partly as a result of the buoyant shipbuilding industry, Nor-Shipping's exhibition space was fully booked by December, 2006. However, thanks to a temporary expansion plan, the organisers have been able to offer additional space to more exhibitors.

In addition to the exhibition, Nor-Shipping will expand its 'Leading Voices' conference concept this year. The opening conference will focus on Arctic shipping - a topic that is in vogue in the maritime community, as well as the oil and gas industry, governments and the public at large. Three scenarios for Arctic shipping development will provide a starting point for commentary and keynote speeches will be given by panellists that are experts and leaders in Arctic development.

New this year is a concept called Young-Shipping. Taking place on Thursday 14th June, this event brings industry leaders before a new audience - students and recent graduates.

The traditional Nor-Shipping grill party at DNV takes place on Tuesday night 12th June. Another innovation this year will be a Nor-Shipping regatta in Oslofjord on Monday 11th June.

Conferences

TANKEROperator, *LNG Journal* and *Digital Ship* are producing one day conferences on Thursday 14th June.

Under the banner of 'What makes a professional tanker operator in 2007', *TANKEROperator* will be continuing and broadening its look not only at TMSA as in past conferences, but also at other issues, including crew management - a key element in today's looming shortage of quality seafarers.

Chaired as usual by Lyras Shipping's Dimitris Lyras, the tanker day kicks off with Ole Wang, now vice president shipmanagement of Barber Shipmanagement who will advise on the 'approaches to professionalism in tanker operations'.

Wang will be followed by Capt Vijay Rangroo, group executive vice president of Eurasia who will address the subject of 'getting the most out of crew in today's employment marketplace'. OSM Shipmanagement's John Hough follows with 'how today's professional tanker operator approaches crew management'. Capt Ranjith Cheerath, head of safety, quality and environmental global team at EMS Shipmanagement, formerly TESMA, will talk about the 'professional approaches to tanker operations and crew management in 2007.'

Tollef Schiander – A sell-out.

Moving on specifically to TMSA, Asbjorn Grini, quality assurance manager of Vista Shipmanagement will give his experiences with the scheme. Roy Chenery, principal consultant at Lloyd's Register will tell the delegates about 'projects optimising maintenance strategy for tanker operators.'

Finally, a speaker from Germanischer Lloyd will try to explain 'how excellence can be defined or rewarded.'

There will be two panel discussions addressing professionalism in today's tanker operators and other topics pertaining to quality.

In conjunction with the Tanker Conference, there will be a discussion about LNG shipping

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chaired by Dr Kirsi Tikka, vice president technology and business development at American Bureau of Shipping (ABS).

First up will be Hakan Werner, vice president business development LNG at IM Skaugen, who will take a look at Skaugen's new fleet of multigas carriers - the flexible solution for small LNG shipments. Next will come Mokran Yataghene, project manager, Gaztransport & Technigaz (GTT) who will look at the developments in membrane containment systems on LNGCs.

GAC-RUR's chairman John Reynolds will extol on the agents' role in servicing LNGCs calling at US ports. Warsash Maritime Centre's gas ship expert Alan Whitcher will then discuss training and competence assessment.

LNGC propulsion will be addressed by Rune Lysebo of ABB Marine, who will compare the various propulsion systems on offer and give ABB's experience with the *Provalys*, the first gas carrier to be delivered fitted with an electric propulsion system.

Bureau Veritas' Fred Venner will look at developments with floating LNG production and revapourisation units, while rival DNV will address the winterisation question, thrown up by such loading terminals as Snohvit. Again there will be ample time for discussion and questions from the floor.

Exhibition Preview

Faststream

Faststream Recruitment expanded its Scandinavian operations by opening a branch office in Oslo earlier this year.

Headquartered in Southampton, Faststream had already experienced rapid international growth with the successful launch of a North American office in Miami, which serves the US Maritime recruitment market.

With no existing specialist recruiter focusing specifically on these three core areas of the maritime industry - shipping, marine and offshore - and an increasing demand for Faststream's services in Scandinavia, this is seen as an important strategic move for the business.

Managing director Mark Charman commented: "Oslo is an international maritime centre, with good access to Norway's fast growing offshore market and excellent communications links with the rest of Scandinavia. Oslo is therefore ideally suited as the planned location for Faststream's Scandinavian regional headquarters."

Charman added: "Establishing a physical presence in Scandinavia will help us to build on our reputation as a global recruiter in this specialist sector, and Nor-Shipping is an ideal platform from which to launch this business".

Christian F Meidell Lange was recently appointed director of Faststream Recruitment AS, the new Scandinavian company. Meidell Lange came from Marcura Partner /DA-Desk where he also held the position of director.

He has spent the majority of his career as a shipbroker and charterer for shipping and trading companies in both the drycargo and the tanker sectors. With international experience in Germany, UK, Canada, Denmark, and for the last 15 years Norway, he is ideally suited to launch Faststream's Nordic business, the company said in a statement.

Faststream's aim is to provide a superior recruitment service to both clients and candidates within the Nordic region and Germany, focusing on commercial, technical and operational sectors of the maritime market, backed by the US and UK offices.

Meidall Lange commented: "Many shipping companies are enjoying a booming market and have secured future orders for vessels to be delivered over the next few years. In nearly all sectors there is a lack of good qualified people to fulfill these orders and continue their growth plans.

"Our business is to assist companies recruit and retain the best possible people by building the link between leading clients and the best candidates."

Recently, Faststream said that the specialist shoreside recruitment sector had gone 'berserk'. There is a huge demand worldwide and people were queuing up for help in finding experienced staff. This is particularly true of the Middle East and Greece.

Six figure fees for specialist seagoing officers were now normal and consultants can earn several thousand pounds per month for representing beleaguered shipowners in areas such as shiprepair.

SAM Electronics

SAM Electronics will feature its latest navaid and automation hardware developments.

Exhibits include the BSH and USCG type-approved Multipilot 1100 multi-function navigation workstation combining ARPA radar, ECDIS, conning and automatic steering control functions; also featured will be a Chartpilot ECDIS for desktop or console mounting.

Automation exhibits include the MCS 2200 integrated control assembly with newly-developed modular workstations providing rapid acquisition, processing and display of data while simplifying all main ship operating functions.

In addition to the SeaSense decision support system derived from a series of intelligent sensors, there will also be a presentation of SAM's diesel-electric propulsion systems designed for commercial vessels.

SAM Electronics is exhibiting in association with Valmarine of Norway, a fellow member of L-3 Communications' Power & Control Systems group. The two companies have recently established a partnership agreement covering development of a common product policy for complex integrated ship control assemblies featuring not only navigation and automation sub-systems, but also those for ship safety and security.

SpecTec

The history of SpecTec and AMOS is the history of software at sea. For over 20 years, dedicated to IT solutions for the maritime sector, SpecTec claimed to be leading the way.

It's software and consultancy services cover all aspects related to maintenance, stock control, procurement, personnel management, and the full portfolio of maritime issues linked with quality management, such as tanker management self-assessment (TMSA), the ISPS and ISM codes, emergency response system (ERS), shipboard marine pollution emergency plan (SOPEP) and others.

For the oil and gas sector, SpecTec has created specialised modules to cover all the industry specific issues related to maintenance, stock control and safety procedures.

Today, SpecTec and AMOS offer fleet management solutions, offshore asset management, ILS applications, and a number of specialised services, which are claimed to be difficult to find elsewhere.

Tamrotor Marine Compressors

Tamrotor Marine Compressors (TMC) will present three recent major developments at Nor-Shipping.

To strengthen its position in China, TMC - together with long term strategic partner, Sperre - opened an office in Shanghai in March this year. The company is called Sperre China and was opened specifically to serve the numerous shipyards in the region. Together, Sperre and TMC offer complete equipment packages for all the air needed on board.

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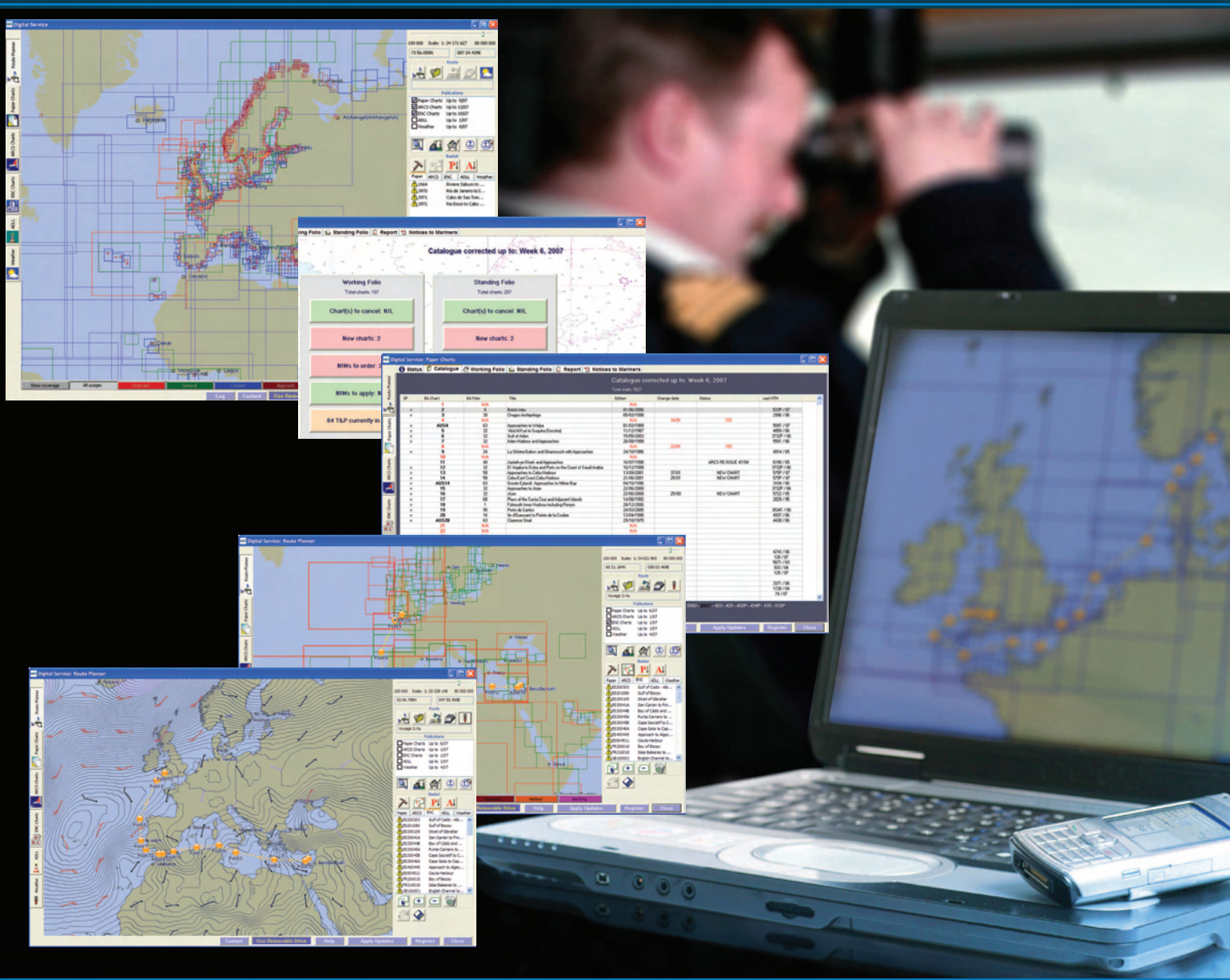

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TMC has also developed a new high-capacity compressor. This unique design, with all high elements placed at one end, allows for installation in a smaller/lower area compared with other compressors. Also, all service points are accessible from one side, which means that placement is flexible not only in terms of height, but also in terms of horizontal space, as it is not necessary to be able to access the compressor from more than one side. All canopy walls can be removed.

Other benefits of this new compressor include the possibility for soft-starter or smart air frequency control (which can be integrated in the electrical cabinet), flange connections ready for connection, integrated lifting facilities. The compressor is water-cooled and vibration dampers come as standard.

To make it easier to choose original spare parts for TMC compressors, the company has introduced spare part kits. These contain all the parts that should be replaced after a certain number of running hours/years. Also included are the instructions for changing the parts.

Benefits of using these kits include - lower price per part than when purchased item by item, time saved on ordering and checking and certainty of getting all necessary parts - and no unnecessary parts. This means there will be no unscheduled stops due to missing parts.

Transas

At Nor-Shipping, Transas will display its ideology of setting marine standards by presenting an innovative and highly acknowledged approach presenting the full scope of its solutions for navigation, maritime training and vessel traffic services.

A special emphasis will be placed on integrated multi-tasking simulation systems intended for crew resource management training. The range of simulation systems on the stand will include navigational simulator Navi-Trainer Professional 4000; GMDSS simulator TGS 4100; Engine Room simulator; and Liquid Cargo Handling Simulator LCHS 4000, all integrated in a common virtual environment.

On the Transas stand this year the new generation of integrated on board systems will be on view, including the Transas Integrated Navigation System (INS), based on the Hyundai-Transas Integrated Bridge System - the first system in the world to be type-approved as INS class C. The use of the latest technology allows Transas to fulfil the highly ergonomic design and functionality demanded from owners and navigators.

Other products to be presented on the stand include: ECDIS, with a demonstration of the DNV type-approved Transas SENC service and SPOS Weather Module and the Navi-Radar 3000-I system, performing all the functions of radar and ARPA and possessing the ability to overlay electronic charts on the radar picture; and other Transas applications for navigators.

Voith Turbo Schneider propulsion

Two Voith Turbo fins have already been installed in the Norwegian Voith Water Tractors (VWT) *Velox* and *Tenax*. The two VWTs are operating successfully and two more are under construction.

Voith Turbo is a group division of Voith. Voith is an official partner of the initiative 'Germany - Land of Ideas.' TO

StealthGas keeps bubbling along

Harry Vafias' StealthGas seemingly cannot keep out of the news. Ship purchases, rumoured takeovers and share price hikes were all featured in the shipping press in April alone.

The LPG owner and manager has experienced something of a meteoric rise since its foundation in 2004, culminating in a listing on NASDAQ in October, 2005 through an IPO, which was almost three times oversubscribed. In just four years, the company has risen to become the largest player in the handysize LPG carrier business.

Last month, rumours of a possible sale of the fleet of StealthGas to Stolt Nielsen surfaced. However, any talk of a takeover has been denied by both sides. StealthGas head Harry Vafias said: "We are not negotiating with anyone at the moment", but also added; "Some people are knocking on our door, but we haven't had any offers. We are traders at heart, so if we see a very generous offer we would take it to our board." However, the rumour did affect the share price, which shot up by 5.6% to $15.95, valuing the company at $230 mill, whereas the fleet is worth in the region of $500 mill, Vafias claimed.

At the end of April, 2007, StealthGas boasted a current fleet of 29 vessels and claimed to be the world's largest owner of handysize LPG carriers having a market share of 12%. However, not stopping there during the month, agreements were signed to purchase another four vessels, which will be delivered this year for an aggregate sum of $51 mill.

The four new purchases, together with another newbuilding also due to join the fleet this year, will mean that by October StealthGas will have grown to 34 vessels with a total capacity of 150,769 cu m. The new purchases will also raises the company's market share to 13% in the 3,000 to 8,000 cu m capacity range and will also lower the average age of the fleet to 10.3 years, against an industry average of 17 years.

Vafias said he believed that the market for seaborne LPG will increase from the present 50 mill tonnes per annum to around 75 mill tonnes per annum by 2010 and 85 mill by 2015. He explained that he saw an opportunity in the handysize sector as there was a negative orderbook through to 2009-2010 resulting in the market remaining firm.

Harry Vafias

During 2006, the company experienced 98.8% utilisation of the fleet. According to the posted annual results, the total revenue was $73.3 mill giving a net income of $18.5 mill and EBITDA of $36.7 mill. The earnings per share were $1.31 on 14.2 mill average shares outstanding during the year. The net debt to capitalisation was 45.6%, while the current net debt to values was about 40%.

Thus far, the company has paid out roughly $11 mill per annum in dividends and recently paid a dividend for a fifth consecutive quarter. The total dividends paid last year amounted to $0.75 per share, while StealthGas declared a dividend of $0.1875 per share for the first quarter of this year.

Period chartered

The vessels are mainly timechartered or bareboat chartered to leading energy companies, such as Shell, Petrodec, Vitol, Statoil and Finaval. By the beginning of April this year, StealthGas has 96% of the fleet covered by period charters and more than 85% of fleet days will be covered by fixed employment throughout 2007.

Vafias' optimism is based on volatile and unreliable feedstocks from Saudi Arabia, which will be replaced by more reliable LNG derived cargo volumes; increased exports from the Middle East and West Africa; increased demand from the US, India and China, while fleet growth will be more than absorbed by fleet replacement and stable demand. Basically, the increase in the supply of LPG was being driven by rising LNG production and crude oil refining. Increased LPG supplies have already had a positive impact on freight rates and this trend was likely to continue, he thought.

He also said that by being involved in a niche market, the company had been able to consolidate in the LPG sector and gain economies of scale from its high market share. For the future, despite the Stolt Nielsen rumour, Vafias said that the way forward was to increase the size of the fleet by organic means and to grow by strategic acquisitions in a similar or related sector. He did not rule out entering the LNG market at some point in the future.

These measures would be necessary to increase the company's market capitalisation, increase the share count and float and to foster analysts' interest in StealthGas. Once the capital base had been extended, this would open the door to more flexible and competitive funding options and would also impact on economies of scale and tighten the company's market control in the handysize sector.

Vafias and his team use both in-house and third party shipmanagers to look after the technical side of the business. Last year, the average daily operating cost per vessel was $2,426, while the timecharter equivalent for each LPG carrier was $7,174 per day.

Recently Vafias brought around 10 of the ships back into the group's in-house technical management team, but still uses V Ships (Cyprus), EMS (Singapore) and Swan Shipping of Manila to technically manage the other gas carriers in the fleet. He said with specialised ships, specialist crews were needed.

Explaining the rationale behind the mixing of in-house and third party management he said that this gives the Vafias group the option of enabling a comparison to be made between the outsourced managers and its own in-house technical teams to benchmark their performances and in addition, by splitting the management, access is gained to different crewing pools. TO

Fair blows the sulphurous wind for France: blow, gentle gale[1]

According to marine engine builder Wärtsilä Corporation, there are no modifications that can be made to diesel engines in order to reduce sulphur oxide (SOx) emissions, reports Brian Warshaw.

The only way to reduce SOx emissions is either to burn fuels with lower sulphur content or to treat the engine exhaust gases. Marine diesel engines normally operate on heavy fuels oils (HFOs) with a sulphur content ranging between 1.5% and 3.5% sulphur, and although they can run on low sulphur fuel oils (LSFOs), with a sulphur content of less than 1.5%, there are associated problems with the selection of appropriate grade of cylinder oil, where grades of fuel oil are constantly switched.

The primary regulation governing the prevention of air pollution from ships is MARPOL Annex VI, which entered into force on 19th May 2005, and covered, among other areas of environmental concerns SOx emissions, reduces the worldwide maximum sulphur content in ISO 8217 RM grade fuels to 4.5% and allowed the creation of Sulphur Emission Control Areas (SECAs) wherein the maximum fuel sulphur contents is limited to 1.5%.

By virtue of MARPOL VI and European Union (EU) directive 1999/32/EC, the first SECA in the Baltic Sea became effective in May last year. The North Sea and English Channel SECA will be in force from 11th August 2007 under the EU Directive; but three months later according to the IMO.

Yet according to Dr Rudolph Kassinger and Martin Verle who are fuel consultants with DNV Petroleum Services matters are not as quite straightforward as they might appear. In a 2004 study, DNVPS found that less than 6% of worldwide HFOs were equal to or less than 1.5% fuel sulphur content; nearly 90% of worldwide deliveries contained at least 2% sulphur, around 44% had a 3% or more sulphur content. A further difficulty they found was the skewed geographical distribution of LSFOs. Only in South America, far from the Baltic or North Sea, was the average marine sulphur content within the 1.5% target.

In the short-term, DNVPS considered that the most practical solution appeared to be the re-blending of high and low sulphur components. However, if all marine supplies of 1.5% sulphur content were to be blended with fuels containing less than 2.8% sulphur content, then the amount of SECA suitable fuel would rise to 16% of total supply. A second option, according to DNVPS, would be to blend high sulphur residual fuel with an approximate equal volume of marine gas oil. However, this solution would produce a very low viscosity expensive fuel.

Although industry sources advise that worldwide supplies of LSFOs are sufficient for current needs, albeit possibly in the wrong places, the problems do not end there. According to Razaghi Meyer International (RMI) the UK-based manufacturer of high accuracy density and viscosity sensor systems, much of the fuel being supplied does not comply with the bunker delivery note (BDN).

Using a simple viscometer, RMI proposed what it referred to as the *INtegrity* principle, in which the flowing density and viscosity of the flowing bunker fuel was compared to the laboratory analysis on the BDN. It claimed that this would lead to a *Continuous Emissions Reporting System* (CERS), and explained that it was necessary for the success of multilateral environmental agreement (MEA), such as that MARPOL is monitoring.

The problem, according to

RMI, is that bunkers are not being delivered as a homogenous, well managed and well described fuel. Currently density measurement shows that over 50% of fuels are not according to the BDN, and it is believed that the same is true of viscosity measurements. The cause is either that the original sample and analysis was not valid or that the fuel quality has changed through stratification, separation, consolidation or adulteration. In essence, RMI says the root cause is that fuels are badly managed.

Consequently, while vessels may attempt to comply with legislative requirements, and keep different fuels in separate tanks, they may still be liable to prosecution depending on how the legislation is written and enforced.

A further difficulty highlighted by RMI is, according to Jon Watson, technical manager, '...since many fuels are batch blended, the description on the BDN is determined using predictive methods based on the original properties of the HFO and distillate fuels. While other suppliers only provide a generic certificate and certify the fuel as compliant with ISO 8217.

'The question for the IMO is "does it matter to MARPOL Annex VI if the BDN only declares generic values for the density and sulphur content?" If it doesn't, *INtegrity* has no real value since it cannot [be used to] detect change in fuel quality. *INtegrity* is fine if the fuel has an exact description which includes the viscosity, as it must if it has been analysed, since any change in quality will result in a change in density and viscosity that it will detect,' he said.

A failure on the part of suppliers to invest in fuel management, with its consequential effect of causing ships to use off-specification bunker, could lead to calls for mandatory monitoring of fuel sulphur at the engine, a solution postulated by MARTOB following an investigation into the use of LSFOs that concluded in mid-2004.

At least three commercial companies are actively pursuing the development of scrubbers to remove SOx at the tail end of the engine, Wärtsilä, Krystallon, and Marine Exhaust Solutions (MES).

In January, Wärtsilä announced that it had started a two-year development project to test scrubbing plant for removing sulphur oxides (SOx) from the exhaust gases of marine diesel engines burning typical grades of HFO. Wärtsilä will study the equipment's performance in realistic applications to identify any difficulties in installing and utilising scrubbing equipment on board vessels. It will investigate the effect of scrubber design on engine performance, lifetime operation, and economy.

Concurrent with its own project, a large environmental study is being run in association with research institutes and maritime administrations into the discharged water. The report's conclusion will lead to appropriate water treatment systems so that it would have no adverse impact on ecosystems.

Wärtsilä intends to design a complete exhaust gas-cleaning system compliant to IMO requirements and other regulations, and it envisages that the results obtained from the project will be equally applicable to any two-stroke or four-stroke engines in the Wärtsilä marine engine portfolio as well as to other manufacturers.

Andy Osbourne, Krystallon's business development director said, 'Designed for a minimum

25-year life, Krystallon's seawater scrubber is based on the principle that seawater is alkaline and contains naturally high levels of sulphur. The design uses the buffering capacity of the sea to neutralise sulphurous gases. The scrubbing water is processed to remove all potentially harmful components extracted from the exhaust gases, and these components are retained on board, with the rest of the vessel's oily waste retained for safe disposal ashore. Residual waste from the scrubbing process is a slightly higher acidic liquid solution, which after further dilution with seawater, can be returned to the sea.

'The extraction process however, does raise the percentage of oily waste by around 20%,' Osbourne explained. 'This figure is too high for some operators, whose disposal costs in some geographies are considerable, therefore we are currently investigating if the waste, which at present has a water content of around 40%, can actually be stored as dry blocks. These could possibly then be sold on for use as bitumen in road surfacing.'

'Scrubbers also remove around five to 10% of nitrous oxide (NOx) emissions. This is only a small percentage, but in line with worldwide aims of emission-reduction, we are now also looking at new technology to combine NOx and SOx exhaust gas removal,' Osbourne added.

Krystallon is a joint venture between BP Marine and Kittiwake, a company that provides test, measurement and monitoring equipment for fuels, lubricants and water systems. It is more than a year since the announcement that it had successfully tested a prototype seawater scrubber aboard P&O's ropax *Pride of Kent*, which sails on the Dover to Calais route.

Monitoring of emissions and water discharge is key to the success of seawater scrubbers. Krystallon has developed an exhaust emissions monitor based on the Quantum Cascade Laser (QCL), which the company claims offers high levels of accuracy and reliability, and a single system can monitor all engine emissions, both before and after scrubbing. The QCL can be linked to the ship's GPS and together with exhaust measurements, transmitted to Krystallon's offices at Littlehampton in the UK.

The second monitoring activity associated with seawater scrubbers is the discharge of water back to the sea. Traditional oil-in-water monitors used for bilge and ballast systems are unsuitable for monitoring the very low levels of hydrocarbon discharges from the wash water treatment plant. Krystallon will be using florescence meters, which have been adapted from use on large industrial water-cooling plants, to suit the requirements of the marine industry.

Results from using the equipment show no measurable SOx emissions after the scrubber, despite using 2% sulphur fuel. The Krystallon test results are not only below the level required by European Union SECAs, which allows emissions of 6 g/kWh of sulphur dioxide, and they may even comply with the EU's more stringent port requirements, which will come into force in January 2010 under EU Directive 1999/32.

According to the company, its seawater scrubber working with a typical four-engine 2MW auxiliary diesel generator plant will remove 830 tonnes of sulphur and 80 tonnes of particulate matter annually. For a main engine configuration, the typical figures would be 2,500 tonnes and 250 tonnes respectively.

Describing a possible scenario, Osbourne said that based on the results of trials with the *Pride of Kent* installation, if an emissions trading scheme was implemented then not all the vessels in the fleet would need to be fitted with scrubbers.

'All vessels would need to be fitted with monitoring equipment,' Osbourne claimed, ' but depending on the percentage of sulphur in the fuel and detectable emissions from that vessel fitted with the scrubber, it would be possible, by combining these figures, to calculate the overall SOx emissions value.' At the present time there is no trading scheme agreement, nor is there currently government backing for one.

It is understood that before the end of 2007, BP Shipping will place an order for a Krystallon system to be fitted on the aframax *British Oak*, which is operating on the west coast of the US. The average cost of a retrofit system for a tanker is less than $2 mill, with the newbuild option some 30 to 35% lower, as the system can be designed at an early stage in the vessels construction. At approximately the same time, Krystallon will have systems installed on a containership, and the cruise ship *Zaandam*, as well as BP's *British Oak*. All three vessels will be operating in the emission sensitive areas of Los Angeles and Long Beach, California, and the Vancouver-Alaska area.

Holland America Line's cruise ship *Zaandam* had its seawater scrubber fitted during a two-week period in drydock, and its first sailing was from Vancouver on 22 April. The technology demonstration is being undertaken in co-operation with several US and Canadian government and regulatory agencies, each of which has a representative on the technical advisory committee that is overseeing the development of the project

It has cost the shipowner more than $1.5 mill, although financial

Krystallon scrubber being installed on the cruise vessel *Zaandam* in April 2007

assistance was forthcoming from the US Environmental Protection Agency, Puget Sound Clean Air Agency, the Ports of Seattle and Vancouver, Environment Canada, the British Columbia Ministry of the Environment and the BC Clean Air Research Fund, as well as Krystallon.

According to Robert Clarke, business development manager with MES of Prince Edward Island, Canada, if one works in the shipping industry, the chance is that they will come across an EcoSilencer during your future working life.

The MES C3 EcoSilencer is the result of over six years of development. Using the well established concept of seawater scrubbing to remove the sulphur particles from the exhaust stream, the first full scale trial was carried out, as with the Krystallon unit, on the *Pride of Kent* where the design concept was proved to be effective.

'These tests at sea completed the development of the ES C3, and confirmed our confidence in its capability to remove SOx down to trace levels,' Clarke explained. 'The total amount of removal is a function of the amount of seawater supplied to the system. We found that an average of 50 tonnes of seawater per Megawatt of engine power per hour, will reduce the 3% sulphur fuel to trace levels, or conversely reduce 4.5% fuel to 1.5% equivalent.' The system, according to Clarke, will also remove a significant portion of the visible particulate matter from the exhaust at the same time, along with a nominal NOx reduction of around 5%.

'Soot and oils captured in the exhaust are removed through a series of hydro cyclones, and the sludge is processed through a settling tank, where it is siphoned off to the vessel's waste oil tank,' continued Clarke, as he explained how the exhaust system operated. 'The wash water is safe for overboard discharge. Rates of sludge accumulation are typically less than 10 tonnes per month, and depending on the ship's trade, the sludge can be disposed of ashore with the waste oil or returned to the refinery for disposal.'

MES considers that the benefit of exhaust gas cleaning over the alternative of LSFO is in the depth of sulphur removal, which creates the equivalent of a distillate, at the cost of residual fuel. The same environmental benefits are achieved without the energy loss, additional greenhouse gas emission, or doubling of the fuel cost required to process residual fuel into distillate fuel.

'For a shipowner whose vessel is resident in a SECA or frequently transits through one, abatement technology is the competitive option. As SECA areas grow and the newbuild designs are orientated to a more emissions-conscious future, the technology will find its way onto the VLCC fleet. Future developments include supply of inert gas, improvements in particulate matter reduction, and NOx reduction through exhaust-gas recirculation,' was Clarke's confident prediction.

'Costs of the technology range depending on engine size, however, based on fuel consumption and a conservative prediction of $70 per tonne for SECA approved fuel, payback is two to three years for newbuilds, and four to five years for retrofits. The advent of emission trading opportunities for offsets for older vessels will improve the return on investment and ease the introduction of the regulations into existing fleets,' he said.

A guideline for the certification of seawater scrubbers is underway. The IMO's Marine Environment Protection Committee issued SOx cleaning emission guidelines in 2006. Wash water criteria are under review, along with recommendations on ship emissions, and it is anticipated that these will be issued at MEPC 57 in early 2008.

Contrarily, the independent tanker owners association (Intertanko), appears to have set

British Oak – soon to be fitted with a scrubber?

itself against the beliefs of Wärtsilä, Krystallon, and MES, for mechanical on board abatement systems as a solution to emissions, and is pressing for the inclusion of marine low sulphur distillate as a viable option.

In November last, Intertanko tabled a proposal to ensure that the IMO had a complete and open discussion of all possible options to reduce ship's engine emissions. The organisation suggested the use of distillate fuels, typically marine diesel oil, with a two-stage cap on sulphur content - starting with a maximum sulphur content of 1%, reducing at a later stage to half that value for new vessels. Intertanko went so far as to advocate the establishment of a global SECA, parallel to the development of an appropriate fuel specification standard.

Dragos Rauta, Intertanko's technical director said at the time that, 'The use of distillate fuels would achieve a long-term goal to reduce emissions from ships in a holistic fashion, and at the same time will reduce the operational complexity of ships.' He claimed the fuel would reduce SOx, NOx and particulate matter emissions, while producing measurably reduced carbon dioxide.

Intertanko is concerned about the availability and cost of marine distillates and LSFO, concerns that mingle with worries about the alternative of fitting and operating pollution abatement systems, and subsequent disposal of their toxic wastes. It is this that has led the organisation to applaud IMO secretary general Mitropoulos's initiative in proposing to the MEPC a study group, which will ensure that a decision on the revision of Annex VI is kept on track to meet the implementation target date of 2010.

Meeting between the 16th - 20th April, the bulk liquids and gases sub-committee of the IMO's Marine Safety Committee also turned its attention to ways of reducing harmful air emissions. Several decisions were made with regard to NOx, SOx, and volatile organic compounds (VOC), employing mechanical, fuel adjustment, and economic methods.

The sub-committee also noted the working group discussions relating to proposed amendments to regulation 4 of Annex VI, which would allow coastal states and administrations to voluntarily conduct trials of economic instruments, such as differentiated fairway dues, emission trading or any other similar scheme. The representatives decided that the proposed revised regulation should be forwarded for further consideration.

Agreement was reached for a 1st January 2011 deadline for a NOx emissions reduction known as Tier II, producing a fall of 2 - 3.5 grams per kilo based on kilowatt/hour across the current curve. The sub-committee considered this to be attainable through in-engine design. Tier III was tentatively agreed for 2015/2016, but would impose more stringent limits and require the development of new engines or the use of different after-treatment techniques.

Five options were considered by the sub-committee to reduce SOx emissions. These ranged from reducing the global cap of 4.5% mass/mass on the sulphur content of fuel oil; to allowing or requiring shipowners to use low sulphur distillate fuel and/or the use of exhaust gas cleaning technology to achieve a similar level; or to allow the use of residual fuels in combination with alternative mechanisms to obtain an equivalent level of emission reduction.

Finally, the meeting agreed in principle to proposed amendments to MARPOL Annex VI, regulation 15, to prevent emissions of VOCs from tankers. At present, tankers can be regulated in ports or terminals under the jurisdiction of a party to the protocol of 1997. However, the proposed new regulation would require every tanker carrying crude oil to have on board, and implement, a VOC management plan.

The management plan would need the approval of the flag state, and would minimise VOC emissions during loading, sea passage and discharge of cargo. Consideration would also need to be given to VOCs generated by crude oil washing.

The bunker supply industry, tanker operators and legislators stand at a crossroads. A relatively small amount of investment could ensure the better management and analysis of fuels, which could then be accurately crosschecked at the time of delivery using viscosity and density measurement. It is an investment that might even provide a financial return for the supplier, for as RMI's Watson argues, 'INtegrity should win hands down on price, especially when used in blending. A viscometer will eliminate the "give-away", the excess distillate used by ethical suppliers to ensure a "safe blend" is delivered to the vessel.'

Alternatively, tanker operators may be forced to install expensive seawater scrubbing systems, although this will have the additional benefit of reducing NOx and particulate matter, as well as SOx. Conversely, it will require more storage space to be made available on board, and create extra waste management problems for the ports.

The decision as to whether it is the bunker supplier or the tanker operator who spends the money will ultimately reside with the decisions taken by the IMO, EU and US authorities. It will depend on whether they want to take advantage of the additional environmental benefits that end of engine exhaust systems can offer; but the decisions taken at the BLG sub-committee give every indication that they will. TO

[1] Edward the Second, with apologies to Christopher Marlowe (1564-1593).

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More arguments on MARPOL VI

In two recent Articles, George Kaminis* explained how the MES' exhaust gas cleaning system ECOSILENCER allows the continuation of use of today's fuels in full compliance with MARPOL VI.

The third article gives an update on the subject for the co-ordination of shipping towards the correct implementation of MARPOL VI, which is of imminent interest for the reasons explained below.

Whereas ECOSILENCER is the most economical and safest long term solution, MARPOL VI is in danger of being turned into a triple tragedy if there is enforcement of distilled fuels worldwide. If shipping does not react collectively, immediately and dynamically against such an erroneous decision, in order to prevent disasters against -

A) The ENVIRONMENT, due to huge accumulations in the atmosphere of CO_2 and other harmful emission compounds by the production of distilled fuels, in case of their general use worldwide, which is badly proposed on the excuse of MARPOL VI. This is a diametrically contrary proposal to Kyoto Protocol's goal anticipating a reduction of CO_2 and another five Greenhouse gases emissions by 29% through to 2010.

B) SHIPPING, due to double cost of distilled fuels (DFO and GFO), plus the additional cost of alternative lubricants, including unpredicted wear and repair cost to over 25,000 marine diesels in operation plus those that will be delivered, which are basically designed to burn fuels with high sulphur content.

C) WORLD ECONOMY - due to double cost of distilled marine fuels automatically reflecting a 40-60% increase on the cost of transporting goods by sea (about 70% of total), with immediate risk of triggering a Third WORLD WAR, due to such a violent economic depression covering the whole world.

This is a very important moment in the future of environment, shipping and of the world economy and peace are in jeopardy. Let the following three reference quotes put the correct perspective in our minds, and lead us towards the right direction within MARPOL VI implementation in parallel with IMO.

1) *"The perspective of considerable increase of offered capacity in the following years, naturally may influence negatively the future course of freights",* according to a comprehensive article of a very successful managing director of a big shipping company.

2)*"The small economy in fuels by the use of a shaft generator, it was the profit to keep our ship operational during the last crisis",* according to an owner.

3) *"Because shipping is a competitive business, ship operators are always under pressure to provide quality services at a minimal cost - and this pressure is increasing",* according to the secretary general of IMO, (IMO NEWS, No 4, 2006).

What would happen to shipping in a future fall off of freights, due to overcapacity or other causes and the doubling of the fuel costs? It is an easy conclusion.

In the two recent articles we gave a realistic picture of this problem, and an authentic suggestion for a solution, against those called as specialists, that try to generalise the catastrophic solution of distilled marine fuels on a worldwide scale in MARPOL VI, by overstating the reality.

George S. Kaminis

The Ship will not withstand another double whammy on MARPOL VI, whereas the cost of installing an ECOSILENCER, which radically solves all the relevant problems for the ship, only corresponds to 2 - 4% to the ships' cost, which is amortised by the economy of continuing to use of today's fuels within three to four years, depending on ship type.

The scrubbing system, which is used by ECOSILENCER for washing the exhaust gases of ships, has been well tested since 1970s, and it works perfectly in the inert gas systems on thousands of tankers.

In addition, ECOSILENCER incorporates a unique cleaning system of sea water before returning it to the sea, according to criteria of the US EPA.

Shipping should be aware of the situation, as if it is overlooked today, the once and for all cost of ECOSILENCER will give way to a 100% or more expensive distilled fuels, and endless wear problems and repair cost of diesel engines in the future.

Do not look what you pay for ECOSILENCER, but how much it will cost you during the whole life of your ships by not having it installed. TO

George S. Kaminis presented the exhaust gas scrubbing system for first time in Greece 1977, with the Inert Gas Systems, analysing their technology in comprehensive articles, published in the INSTITUTE OF MARINE TECHNOLOGY issue No 5, and NAFTILIAKI NAFTERGATIKI of 26th September 1979. For information contact george@kaminis.com

Seeking the optimal blend

Fluctuations in feedstock quality are driving developments in fuel blending solutions*.

Until now fuels for the bunker industry have been blended to make the cheapest possible fuel that meets customer requirements without causing problems. However, the imminent introduction of new sulphur regulations is expected to drive demand for blending, especially in Europe due to the limited availability of low sulphur fuel oils particularly from Russian refineries.

Mixing HFO and cutter stocks in shore tanks and on board bunker barges can result in 'give-away' of light product or - in a worst case scenario -in HFO not meeting the ISO 8217 specification and the risk of legal proceedings.

In many cases the physical supplier claims that the refinery specification is correct and the sellers blending and measuring equipment is incorrect. However this contrasts with field experience where samples are rarely taken from the tanks containing the base and/or cutter stock. While many refineries supply IFO 380 in accordance with ISO 8217, the actual product supplied can sometimes be between 120-260 cSt at 50 deg C - in other words better quality, higher density, and more energy rich than needed.

Yet this means the ship operator is not receiving what he expects and will have to either adjust the engine to operate with the better quality fuel, do further blending on board or raise a claim against the supplier.

Ten years ago when vessels had around 20 crew members on board these might have been viable options. But today, when an equivalent vessel would be lucky to have 10 crew, who are overworked, such options are increasingly unrealistic. Hence, the need for an effective blending solution.

Combining two or more fluids at a pre-determined ratio in order to produce a finished or semi-finished product is a very common operation in the petrochemical industry. In most cases the measured components are fed, one by one, to a blending tank - in a process known as batch blending - whereby the two products are intermixed inside the tank by use of jet nozzles, circulation, mechanical mixers or air bubbles.

This kind of blending demands, besides storage tanks for the products to be blended, at least one tank for each blended product, which reduces considerably the flexibility of supplying different grades and the pushes up the costs involved.

From a quality point of view batch blending also poses a certain risk for the end user. This is mainly due to insufficient homogeneity of the blended product that can result when new processes are adapted at refineries or when more cracked products are introduced to the market. Another factor is the large number of different 'cutter stocks' that are being imposed in order to reduce costs.

In-line blending

The introduction of mechanical fuel blenders (MFBs) in the 1980s was a major step forward in reducing the quality risk and increasing the flexibility for the bunker supplier. MFBs allow in-line blending to take place in which controlled flows, corresponding to the ratio, are blended into a homogeneous product with a known viscosity. During the 1990s in-line blending technology evolved to meet higher demands for safety and quality control in the bunker industry, including:

- Viscosity, temperature and density control.
- Sampling devices - drip sampler and flow proportional device.
- Automatic control of the blending process according to actual viscosity and density.
- Online documentation of blended and delivered products.
- Flow control and documentation of products and volumes.

Today there are two main methods available for in-line blending. The first is mechanical blending either as stand-alone solution or in combination with sophisticated measurement and control techniques, while the second is PI-regulated blending process (also known as volumetric blending) with additional viscosity and density controllers.

Both methods can be used for bigger applications and both fulfil the customer's needs, but mechanical blender is considered to be the more feasible option for smaller flow rates and/or if the installation is to work both on board existing bunker vessel as well as newbuildings.

Mechanical fuel blending

Experience has shown that one of the most efficient and reliable ways of blending two products into one homogeneous product is with a MBF. The best option for achieving an acceptable quality of the blended product is by using a static mixer, but this will increase the pressure drop in the system, meaning lower flow rates or require better pumping efficiency. Nonetheless MBF does confer several advantages:

- **Cost:** It is relatively inexpensive since no auxiliaries, such as electric motors, compressed air, etc are needed, and can it typically be installed at the terminal or on bunker barges.
- **Ease of operation:** Turning a hand wheel changes the ratio setting, which is shown on a numeric display. Once the ratios for different grades have been determined, it is easy for the operator to set the equipment.
- **Ease of installation:** With the connecting pipes properly braced no extra supports are needed and the unit can be mounted as an ordinary valve. No housing is required. In cold climates, or when heavy oils are used, it may be surrounded with a heated and insulated cover. Units installed 70 miles north of the Arctic Circle operate successfully in this way.
- **Compatibility:** Existing auxiliary equipment such as flow meters can be used in combination with MBF.
- **Reliability:** With some 15 years of operation, to date no failures have caused problems on board bunker barges or at bunker terminals.

As a standalone unit the MFB should be capable of producing a 'viscosity blend' with an accuracy of ±2% to the specification. When combined with other precision equipment as part of a more sophisticated blending solution, accuracies better than ±0.5% to specification are possible.

Low sulphur needs could cause blending problems.

Bunker monitoring

Increasing requirements for the control of quality parameters such as viscosity, temperature and density can be met by inline monitoring equipment. This not only minimises the 'give-away' but also ensures an optimal and consistent quality throughout the entire blending process, along with batch reporting at the end of the process.

One example of this technology is the bunker monitor system from CBI. This provides several customisable options for exporting data and includes automatic adjustment of ratio in the blending process at reference viscosity and temperature 50 deg C.

These reference values are necessary so that real-time control of the fuel blending process can be performed. Using the reference viscosity as an input parameter for the control algorithms ensures a good blend, thereby eliminating the need for hot-blending. It is possible by combining monitoring and mechanical fuel blending to achieve a blending result within ±1% to the specification.

The CBI bunker monitor can also measure the density of the blended product in real-time. When HFOs with very high densities are used as a base component, the operator can use density to make certain the blended product is within the parameters of the ISO 8217 fuel quality standard, and in such cases overrule the viscosity set point allowing lighter cutter to be added.

The most sophisticated blending solution offered by CBI is the Flex Blender. This allows a higher level of quality control by further fine-tuning a combined mechanical blending system with monitoring technology.

Data from the monitoring system provides the basis for the enhanced control algorithms that respond instantly to changes in the process and/or the feed stocks to ensure the specification of the blended product throughout the entire blending process. The integrated sampling device allows automatic batch reporting. Furthermore, the equipment benefits from simple installation as it is connected to the main pipe system by flanges. A ball valve is situated behind each inlet and outlet flange to shut off the externally connected pipes. If circumstances require, the whole module can be housed in a container, although this must be heated in order to avoid the problems of moisture and condensation.

PI-regulated blending

The PI-regulated blending process derives from the refining industry where the overriding requirement is for actual viscosity (as opposed to viscosity at 50 deg C). Designed initially for shore-based installations, this technology typically requires a large capital investment and has high operational costs. However, these costs are generally balanced by the considerable volumes that can be handled.

The process is a 'volume metric' one, which combines the use of flow meters and regulating

valves for both feed stocks. The actual blending takes place through a static mixer.

In shore-based applications the specification and in particular the viscosity of the feed stocks tends to be consistent. Consequently the accuracy of a blend can be calculated from volume alone. However, it is unwise to make assumptions about the viscosity of feed stocks that find their way to bunker terminals and barges as these are typically much less consistent.

Hence the viscosity can vary significantly during the blending process and calculating by volume only would generate inexact values. Therefore, to obtain a high quality product it is necessary to determine the viscosity at a reference temperature so that meaningful quality comparisons can be carried out. In most cases, this is an added option for PI-regulated systems, but if made available, the quality of the blend products can be of a high standard. It should be remembered, though, that the PI-regulated blending process has no fall back (manual regulation) if the viscosity signal fails.

Valid solution

A successful installation and performance of blender units depends, in part, on understanding the operational parameters under which the blending unit will operate. Rarely does operational experience correspond exactly with the theory and information provided by suppliers.

Therefore irrespective of the fuel blending technology chosen for an installation, it is vital to carry out a design study at the existing terminal and/or barge/vessel in order to obtain accurate pressure and flow data. If this is not done, the risk is that actual performance will diverge significantly from expected design performance.

It is also in the operator's interest to have a full understanding of the entire blending process and parameters involved so that they are not supplied with equipment that isn't optimised to their needs. Research conducted by CBI suggests that investment costs can often be reduced by up to 35% by doing a site study for expected actual operational conditions in the first phase. This approach also reduces the likelihood of lengthy and expensive disputes.

The design of fuel blending systems also needs to take into account timing and pumping rate. Higher flow-rates and stricter quality control at the customers manifold can cause problems on existing bunker barges at the pumps were not intended to meet such requirements.

If blending and metering equipment is placed on board, the pump needs enough power to lift the fuel from the physical suppliers' bunker barge by 10-25 m simply to reach the manifold and then enough again to push the fuel through at 300 cu m per hour at 3 bar.

In field situations existing pump equipment can experience back pressures of between 4-8 bar, resulting in flow rates of in the region of 50-100 cu m per hour. The upshot being that bunkering takes between 3-6 times longer than it should. For the bunkerer too this is bad news as it restricts the amount of bunkers it can supply (and hence possible earnings) in a given period of time. TO

This article was written by Tommy Christensen of CBI Engineering A/S.

Safety issues for data sheets

Ian Adams, secretary general of the International Bunker Industry Association (IBIA), speaking after the latest round of discussions on the SOLAS Chapter VI, regulation VI/5-1, confided to *TANKEROperator* that, 'The proposal changes a document that is issued to give safety advice to those who handle liquid products, and potentially turns it into a quality certificate for which it was never intended.' Adams had addressed the April meeting of the IMO bulk liquids and gases (BLG) sub-committee.

IBIA's concerns relate to information that is going to be required on the material safety data sheets (MSDS), which will have to be issued to all vessels at the time of loading. Unlike the MSDS that are distributed by land based industries, and are generic to the product supplied, resolution MSC.150(77) from the marine safety committee (MSC) has a requirement for the MSDS to contain the "actual physical and chemical properties," and to "measure several parameters unrelated to safety in the shipped liquid".

To deliver this, Adams argues, would, of necessity, require cargo-specific MSDS to be generated concurrently with the loading operation. It is a task that IBIA does not consider is within the capability of the bunker supplier. Rarely is the actual data on the shipped bunker available at the time of loading, with, in many cases, the marine fuel oil being blended to suit performance specifications, typically for SECAs, by taking a percentage of oil from several tanks to change the base bunker. The final blend may well be checked by laboratory analysis; but this is usually after the vessel has sailed, and is normally by commercial arrangement.

Blending and loading often takes place at third-party terminals or loading buoys where facilities to produce an MSDS are not available. MSDS are, IBIA says, '...a legal document that cannot be revised, approved and re-issued in a short period of time.' Writing an MSDS requires an expertise in toxicology and industrial hygiene, legal and regulatory knowledge, and authoring skills. The MSDS needs to be reviewed and approved by senior management, and retained under a strict document control regime.

IBIA claims that MSDSs are already being issued at the point of loading based upon the requirements of ISO 11014 or in accordance with national requirements such as the Occupational Safety & Health Administration in the US, thereby honouring the spirit of the draft resolution, and ensuring that safety information is available to the officers and crew. Resolution MSC 150(77) significantly departs, according to IBIA, from the recommendations of the United Nation's Globally Harmonized System of Classification and Labelling of Chemicals, including a failure to align with the national and regional schemes that are being unified under the programme. Additionally it omits advice on languages that the MSDS should be produced in, to propose a list of recognised authoring bodies, and the jurisdiction for purposes of regulatory information.

BLG 16 decided to recommend to MSC 82 the adoption of regulation VI/5-1; but suggested it would be appropriate for a new work programme to review the information to appear on the document. It seems to have been a victory on points for the IBIA, with the possibility of a rematch where the arguments can be examined in greater technical detail by a small group of specialists. TO

A comedy of errors…

The 36-month campaign by the Danish Maritime Authority (DMA) to reconfirm the meaning of MSC/Circ.677 paragraph 1.2.3, may come to nothing after the IMO's bulk liquids and gases (BLG) sub-committee reached an opposing decision to that of the fire protection (FP) sub-committee, reports Brian Warshaw.

Meeting in February, the FP sub-committee of the marine safety committee (MSC) rejected the argument put forward by IACS that vessels transporting mixed cargoes of chemicals rated above and below a MESG of 0.90 mm, could be fitted with the one rated above 0.90 mm. This meeting was attended by representatives from 50 member states, all bar one of which opposed the IACS position.

The dispute is over the type of flame arrestor fitted at the exit to the cargo vent on chemical tankers. Paragraph 1.2.3 states that, 'These standards are intended for devices protecting cargo tanks containing crude oil, petroleum products and flammable chemicals. In the case of the carriage of chemicals, the test media referred to in section 3 can be used (these are given to be gasoline vapours, technical hexane vapours or technical propane). However, devices for chemical tankers *dedicated* to the carriage of products with a MESG less than 0.90 mm should be tested with appropriate media.'

What the committee decided was that *dedicated* in this instance, does not mean *only*, as was being argued by IACS; but implied that if a tanker should 'ever' carry such products, then the higher grade of testing should apply to the pressure-vacuum (p/v) valve. In practice this would change the type of valve that could be fitted, and in place of the unit suitable for a Gas Group IIA flameproof area, the higher level IIB unit would be required. The difference in price is around $100.

Arne Thykjær Christiansen, ship surveyor with the DMA, said that the sub-committee had not re-interpreted paragraph 1.2.3; but had expressed its concern that it was being neglected, with some ships not complying with the provisions of the regulation. This view was supported by a member of the working group on MSC/Circ.677, who said that the Danish paper only expressed what had been written in the regulation 1.2.3. While JC Cubisino of Argentina, chair of the FP51 session, concluded that the text was quite clear.

Following the FP sub-committee meeting, John de Rose, the IACS' permanent representative to the IMO said that he didn't know what would be their approach at the BLG sub-committee. It was a surprise, therefore, that at the last moment they presented a verbal address, without having first provided a written paper for the representatives and their team's specialist advisors to study prior to the meeting, as is customary.

The IACS case is based on a literal reading of the regulation, '...devices for chemical tankers *dedicated* to the carriage of products with a MESG less than 0.90 mm should be tested with appropriate media,' based on four points. First, the use in the IBC Code and MARPOL Annexes I and II of *dedicated trade*, *dedicated ships* and *dedicated tanks*. Second, a discussion held in 1985 as recorded in the minutes of the working party on Circ.677, 'Some members strongly reaffirmed the dangers presented by blockage of devices to prevent the passage of flame when used in conjunction with products that would solidify or polymerise.'

The IACS' third point was taken from another set of historic minutes, that of BCH 16.WP.9 from May 1986, 'chemical tanker or specific tanks of a chemical tanker dedicated to the carriage of a specific substance,' and finally an extract from FP 32/WP.8 of January 1987, whereby it was agreed 'that special testing was not necessary except for those substances carried on dedicated ships.'

At MSC's October meeting, the IMO must take control of the sub-committees. Photo credit GAC.

Highly critical

Eric Sorensen, an internationally recognised specialist on p/v valves, and a manager with Pres-Vac, was highly critical of the IACS' argument, saying that there were several other IMO and international standards that contradicted the case, including MSC/Circ.677, which in Section 2.5.3 states, 'End of line devices which are intended for *exclusive* use at openings of inerted cargo tanks need not be tested against endurance burning as specified in 3.2.3.' The daughtsman's use of *exclusive*, denies the IACS' use of *dedicated* to mean *only* or *exclusively*.

He wondered what would be the IACS's opinion on the IMO's use of *dedicated slop tanks* in

MARPOL, or the new rules on protective coatings for *dedicated* seawater ballast tanks, MSC 82/3/3. The first would result in reduced cargo capacity; the second that vessels capable of carrying fresh or brackish water would be exempt. Sørensen doubted this would be the IACS's response, although its current interpretation basically results in making optional any requirements that are applicable to the *dedicated* vessels, if the vessels are accorded a wider field of operation.

Sørensen knew of no way to determine what a ship is dedicated to, other than to look at the approved cargo list according to the ICB code. His informed guess was that there never was or would be, a single ship exclusively with IIB cargoes on the approved cargo list.

To support this contention, he referred to DNV's rules for chemical carriers that require the venting system to be provided in accordance to the list of cargoes, and the DNV list of cargoes cites the flame group. Class NK rules state that tests shall be made with the appropriate flame group if a valve is used on a ship dedicated to the carriage of products marked as IIB, he also cites cases where ABS has demanded replacement for the same reason.

Raising the question of product liability, Sørensen noted the potential challenge in light of knowingly installing non-functioning equipment in direct violation of certified service restrictions. He said that MSC/Circ.1009 which is an amendment to MSC/Circ.677 and incorporates ISO 15364 for marine p/v valves states that the MESG of each cargo being transported shall be informed to the manufacturer of the valves. 'For what purpose other than providing the relevant valves would that information be required. It was also the key to the DMA case, whereby in the specific cases raised the equipment installed was not approved for the chemicals on the approved cargo list and therefore a clear violation of class and CE certified service restrictions,' he said.

At the end of the discussion in April the BLG concluded its determination on paragraph 1.2.3, it '...agreed that IACS may continue to apply its interpretation till such time as the Sub-Committee was instructed to revisit the issue'

Two months earlier the FP sub-committee, which is more directly responsible for the oversight on MSC/Circ.677 than the BLG, made the decision that no changes were necessary, other than the interpretation being applied by IACS.

The MSC's full meeting, scheduled for October this year, must take control of its sub-committees. Sufficient is known technically and linguistically to enable a decision to be reached that is intelligent, technically sound, and practical. It would be irresponsible to allow this issue to continue running and running, as too would it be to fudge the decision and appoint a working party from both sub-committees to come forth with recommendations. Apart from the potential risk to vessels and crew, if the concerns of the FP sub-committee are correct, the reputation of the IMO is in danger of being compromised. TO

Rival pyrotechnics manufacturers join together

Leading pyrotechnics supplier Pains Wessex has joined together with Bremerhaven-based rival Comet under the banner of Chemring Marine, part of Chemring Group, to create by far the largest pyrotechnics supplier to the marine industry.

Pains Wessex was previously part of McMurdo who manufacture EPIRBs, SARTs and Navtex, which was itself recently sold by Chemring to Signature Industries.

The two brand names will remain separate. Both Pains Wessex and Comet have around six main SOLAS products, plus ancillary leisure signals. These are marketed through both distribution chains of around 100 distributors each, which are based in most major ports worldwide. Chemring paid around £6 million for Comet, which has a more modern range and will gradually manufacture most of the products.

Many of the products have military origins, which are now being marketed to the commercial and to the leisure marine sectors. About 80% of Pains Wessex supplies go to the commercial shipping market with the other 20% being taken up by the leisure sector.

Only three companies supplying pyrotechnics have worldwide distribution networks, sales and marketing manager Keith Bradford explained. He said that all the products had MED approval and that each product is valid for typically three years before it had to be replaced. It is an offence to use the products other than in an emergency situation.

The number of products per ship, including the number of liferafts, is laid down by the International Maritime Agency (IMA) and these are regularly inspected to ensure that they are up-to-date. Due to their military background, the products are of a good design and are very reliable, Bradford claimed.

Many of the two companies' distributors have been supplying the products for decades. Major suppliers can be found at the large ports worldwide, such as Rotterdam, Singapore and Hong Kong. China, partly due to its large pyrotechnics industry, supplies its own products. Some are looking to achieve MED status, but Bradford thought Chinese companies' quality and reliability was not yet as good as their European counterparts.

Chemring Marine acts as the sales and marketing focal point and then passes the orders onto the manufacturing factory who ships to the distributor. Products are sourced by e-mail and fax and the suppliers (distributors) are the immediate customer, rather than the shipowning or managing companies, Bradford explained. These number around 200 concerns worldwide and exclude the leisure chandlery outlets. Distributors are often also liferaft service stations.

Recently, Pains Wessex and Comet held their first joint distributors' conference coinciding with the SASMEX exhibition and conference in Brighton, where Pains Wessex and Comet had a presence.

Price is not always the key to a sale, but rather the delivery time/availability as a vessel might not be able to get to a port with a distributor by the time the 'due date' has passed. The average vessel has to carry four line throwers; two man-overboard lifebuoy markers located on each bridge wing; 12 parachute rockets, which must be kept on the bridge.

In addition, each lifeboat and liferaft must contain six red hand flares; four red parachute rockets and two orange floating smoke signals.

Under SOLAS, environmental tests simulating marine service conditions have to be conducted where products are immersed in one metre of water for 24 hours and temperature tested to between + 65 deg C down to - 30 deg C in simulated conditions, as some of the products are exposed to the elements for three years. Each batch of newly manufactured

products has to be randomly sample tested. Roughly 5% are proofed this way, giving confidence that the rest of the batch is fit for purpose.

As well has having the MED Wheelmark, there is a reciprocal agreement in place with the US Coast Guard. Pains Wessex has been audited by Lloyd's Register for ISO 2001, while Comet was audited by the German standards body - SBG.

The company's distributors strive to pick up orders for newbuildings out of the shipyards, as it was then easier to get repeat business. Many flag states will opt for European products, no matter where the ship is built. As for liferafts, RFD takes a lot of Pains Wessex products for its service stations, while Comet works with Danish lifeboat and raft manufacturer Viking's service stations.

RFD drop tests the liferafts containing flares 36 m, inflates and then tests them. The flares need to operational in oily covered waters and also able to be held out of a liferaft's door without the risk of fire or explosion. They also have to burn uniformly and not throw out particles, which could ignite a hazardous area.

Bradford said that down the years Pains Wessex has taken in feedback from the seafarers that have had to use the products, in order to possibly improve upon their performance, always mindful of the distress situations in which they are likely to be used.

Pains Wessex has been chosen for service on RNLI lifeboats and by HM Coastguard. Ease and reliability of use in distress situations is vital, so its important that crews study the operating instructions marked on each signal and are familiar with how they work prior to an emergency occurring. TO

Fire, rescue and safety services launched

A worldwide full-warranty fire and safety systems and services initiative has been launched. This is the first service to be offered under the newly formed GAC Solutions business umbrella. GAC Solutions is the GAC group's fourth and latest business unit.

Called GAC Fire, Rescue & Safety (GAC FRS), it was formed to combine the group's ship agency, logistics and offshore expertise and infrastructure with a service partner network to deliver a solution directly to any vessel, including newbuildings and conversions. Working with strategically selected class-approved service providers around the world, GAC FRS claimed to ensure that installation and any other services can be carried out for any brand and at any location - no matter how remote.

A key element of the new service involves a strategic alliance with international electronic fire and security solutions specialist, Tyco Fire & Security. This alliance brings together GAC's commercial skills and one-stop billing solutions with Tyco's technical expertise, and enables GAC to offer a full range of Tyco's marine and offshore systems.

Christer Sjodoff

Tyco provides classification approved designs, hardware and final testing and commissioning for a range of systems, including fire and gas detection systems, gaseous, foam, dry chemical powder and water-based fire extinguishing systems and ISPS complaint CCTV and access control systems.

GAC group vice president business solutions Christer Sjodoff told *TANKEROperator* that the rationale for setting up GAC FRS is twofold. From a customers point of view they get a single invoice covering FRS, as well as ships' agency and/or bunkering and logistics services, such as spare parts and ship supplies from just one provider.

"On the systems side, we have tie ups with strategic partners. For example, through our strategic alliance with Tyco Fire & Security Asia, GAC FRS provides a comprehensive range of fire protection systems and enables our customers to have direct access to the best technical, design and engineering capabilities in this area," Sjodoff explained.

He also said that GAC FRS' commitment goes beyond just providing reliable equipment and systems for shipboard use as the alliance also works with 30 service partners worldwide to ensure the correct maintenance of those systems.

Explaining the timing of the launch in early April, Sjodoff said: "We feel that it is timely to launch this innovation now. Compliance to health, safety and environmental standards are now a major focus for the maritime industry, including GAC.

"Further, the enforcement of the ISPS Code and other standards on board ships around the world only adds to a high safety conscious environment in which we all operate. So to sum up, I feel it's important for GAC,

GAC Door-to-Deck Delivery

as well as our clients, partners and other stakeholders to be at the forefront of such developments," he said.

Sjodoff also confirmed that this alliance was just the beginning of a network of services to be offered to GAC's clients 24/7.

He pointed out that one of the key strengths of tying up with Tyco is plugging into an entity that spends $100 mill per year on R&D and for its part, Tyco can plug into GAC's portfolio of clients around the world. Sjodoff explained: "GAC also provides the commercial and sales expertise, as well as the flexibility of offering customers a comprehensive neat package, which also includes ships' agency and innovative logistics services.

"It is worth noting that Tyco has a range of products, including complete ISPS packages for all types of vessels, largely based on the company's own manufactured and developed products. Most competitors use components from various suppliers. Through us, clients deal direct with the manufacturer. Tyco also updates/creates some 600 new patents per year," Sjodoff added.

GAC FRS now claims to offer complete services for any fire, rescue and safety/security systems of any brand and class approved through any society. This can include liferafts, lifeboats, fire fighting systems or tailor made ISPS packages for any type of ship. Sjodoff said that a number of clients have been signed up since the company started marketing the dual approach in January of this year.

Responding to the question of how can these services benefit tanker operators, Sjodoff gave the following examples:

- Global coverage.
- Access to a full range of class approved fire, rescue and safety solutions.
- Ability to accommodate even the most complex systems for conversions and newbuildings.
- Installations at sea, in port, or in drydock.
- FRS services can be offered separately or as part of a package, consisting of ship spares and supplies logistics, ships' agency and bunker services.

Sjodoff is a firm believer that any company should never stop reinventing or upgrading itself. "There is always room for more improvements and enhancements", he said. For example, GAC FRS is currently working together with Tyco to provide educational programmes for shipowners.

Sjodoff said: "We can arrange for a firefighting specialist from Tyco to conduct workshops and demonstrations in these areas at very cost effective rates."

As part of its business ethic, GAC and its partners aim to stay ahead of the latest rules and regulations from the IMO and other authorities. Speaking about those owners who do not see the need to upgrade their existing fire, rescue and safety systems on board tankers, Sjodoff said: "I see it as a joint responsibility of all parties involved in the maritime industry to comply with HSSE practices. We cannot afford to have any weak links, as the repercussions would be detrimental. Proper systems and equipment are basic essentials that can safeguard lives and property, so due care must be accorded to this area."

TO

Tanker casualties: ready for immediate response

An analysis of tanker casualties in SvitzerWijsmuller Salvage's extensive caseload demonstrates one issue more than any other - the extreme variety of the services provided - from straightforward rescue tows to complex and challenging operations involving the ship-to-ship transfer (STS) of cargo.

Regardless of the nature of the service, however, the common theme running through virtually all cases is the need for immediate, decisive intervention, to avoid any further deterioration in the situation.

In September of last year, for example, the Norwegian chemical tanker *Vaagen* developed machinery problems while off the Portuguese coast. This vessel, disabled by a shaft bearing failure, was adrift with a cargo totalling 14,170 tonnes of chemicals. The tug *Svitzer Leixoes* was mobilised. She connected up and towed the *Vaagen* to Lisbon. The service was provided under a BIMCO Towhire contract, with the vessel redelivered at the conclusion of a four-day operation.

In June 2006, another Svitzer station tug, the *Svitzer Muharraq,* left the Gulf of Oman to respond to a product tanker with machinery problems off the Indian coast. The tug reached the *Arabian Sun*, connected up and prevented the drifting vessel threatening offshore installations in the Mumbai High Oil Field.

With the *Arabian Sun* in tow, the tug began a difficult return to the Gulf of Oman, encountering heavy south-west Monsoon weather for most of the voyage. Nevertheless, the convoy made at least 3-4 knots and up to 7.5 kts in the more sheltered Gulf of Oman. This 950-mile rescue tow was completed over an eight-day period. It reached a successful conclusion with the redelivery of the product tanker at Fujairah anchorage.

Timely action can make all the difference, as was shown in November 2005 when the asphalt tanker *Stella Rigel* got into trouble off the Welsh coast. This Lloyd's Form operation commenced when the drifting tanker, close into the coast in extremely bad weather, requested assistance. A Svitzer Marine tug based at Milford Haven - the 66 tonnes bollard pull *Anglegarth* - was mobilised, together with a salvage team.

Fortunately, the *Anglegarth* succeeded in preventing a grounding. Meanwhile, the Master of *Stella Rigel* had called for all non-essentials to be taken off by helicopter, as his ship drifted to within eight cables of the Smalls. It was at that point that the lowered anchor began to reduce the speed at which the tanker was drifting in. The tug then arrived and prepared to connect up, despite the night conditions and hostile weather. The tug's crew worked with those remaining on board *Stella Rigel* and, together, they succeeded in securing a tow connection. The tanker was edged away from the rocks, then just four cables away in what the tug master called "a boiling sea"! The casualty was then towed safely to Swansea.

The just-in-time character of some salvage operations was also underlined in November 2004, when the small tanker *Almar* reported mechanical problems while off the Dutch Wadden Islands. This vessel began to drift across the main traffic lane, towards Terschelling. SvitzerWijsmuller responded to this emergency, working with Terschelling-based partners Noordgat. A Lloyd's Form contract was obtained in this case. The tug *Hunter* connected up to the *Almar* and delivered her to

Arabian Sun was towed 950 miles to Fujairah anchorage in monsoon conditions.

safety at Harlingen that same day. Coincidentally, the same vessel was rescued again from a near grounding just over two years later by SvitzerWijsmuller Salvage, using the Dutch Coastguard tug *Waker*. The *Almar* came close to running aground on the Dutch coast in January 2007, during bad weather.

Stella Rigel was safely towed to Swansea.

Responding to groundings

When a laden tanker goes aground, every effort is made to secure a refloating without the transfer of cargo. There are obvious advantages if this can be achieved, not least reducing to a minimum the period over which the casualty is exposed to danger. In many instances, however, there is no choice but to prepare the ship for an STS.

Regardless of vessel type, the priority in most salvage situations is to remove bunkers and so achieve a rapid reduction of the pollution threat. In the case of a tanker, an early salvage inspection will indicate whether a refloating can be achieved without cargo discharge or part-discharge. In July of last year, for example, it was decided that the tanker *Ana B*, laden with 3,600 tonnes of gasoil and grounded in the Amazon at a position close to Manaus, could be refloated without a cargo discharge.

SvitzerWijsmuller personnel based in Brazil were mobilised and salvage equipment was provided from warehouses in Rio and Macae. Work continued to reinforce the salvage effort, with personnel and equipment from Argentina and the Netherlands. In addition, a spill response team was organised, as a contingency. Furthermore, a lightering barge was mobilised, as a precautionary measure, should it have proved necessary to remove some of the gasoil. In the event, however, this casualty was refloated by two tugs without the need for an STS. Following a diving survey, *Ana B* was cleared to proceed upriver to Tabatinga, on the Peruvian border.

SvitzerWijsmuller teams have performed many salvage operations in Brazil, including the recovery of bunkers from the wreck of the tanker *Vicuna* at Paranagua. This tanker was destroyed in an explosion while discharging methanol in November 2004. A team also removed bunkers and the remaining cargo from the crude carrier *Candiota*, which suffered an explosion while off Brazil. This vessel was delivered to the safety of a drydock at Rio.

There are, of course, some situations in which an STS is the only way of saving a ship. This was the case in March 2004, when the laden 68,000 dwt crude oil carrier *Aleksandr Pokryshkin*, grounded close to the entrance of Puerto Cortes, Honduras.

SvitzerWijsmuller had been busy in this region for some time and an established working relationship with shore authorities contributed to the speedy response. It had been calculated that a successful refloating would require the transfer of around 8,000 tonnes of cargo, employing several lightering vessels. Tugs were mobilised from the US and Caribbean. With the part-discharge of cargo completed, the tugs succeeded in refloating the tanker. Subsequently, a diving inspection revealed no significant damage and *Aleksandr Pokryshkin* was cleared to proceed to her intended berth in the port.

Twelve months earlier, another laden tanker - the 180 m *Acushnet* - grounded in a rocky area of the Great Belt. SvitzerWijsmuller Salvage mobilised a joint Dutch-Swedish team to meet this pollution threat. An inspection confirmed that the tanker would require a part-discharge before any attempt at a refloating. Four Svitzer tugs attended this casualty and a two-phase lightering was completed without incident. The tugs then refloated the *Acushnet*, which was redelivered to owners following the reloading of cargo. This operation concluded within four days of the salvage contract being signed.

That period also saw the collision between the tanker *Vicky*, fully laden with gasoil, and the wreck of the vehicle carrier *Tricolor* in the busy English Channel. In this instance the tanker succeeded in refloating herself, but then required immediate salvage assistance. It soon became apparent that around 7,000 tonnes of cargo would need to be transferred to another vessel. This operation was performed safely, with the mooring of the lightering tanker achieved under SvitzerWijsmuller's control.

This salvage then moved into a second phase, with the *Vicky* being prepared for a stern-first tow into Rotterdam-Europoort. Following a safe arrival, the casualty was further discharged and then redelivered to her owners.

SvitzerWijsmuller salvage masters and personnel are trained to respond to emergencies involving tankers of all types, including gas ships. The value of this wide experience was shown in July 2005, when the immobilised, fully laden LPG carrier *Hera* requested assistance.

The *Hera* was some 35 miles off the Iranian coast at that time, at a position about 90 miles east-north-east of Bahrain. A station tug, *Svitzer Duke*, responded from Qatar. Upon arrival the tug connected up and towed the *Hera* to Bahrain.

A more striking gas carrier salvage was the refloating of the *Kew Bridge,* following her grounding off the west coast of India in September 2006. Tackled

together with fellow ISU salvor Smit, this operation involved salvage teams of both companies, together with SvitzerWijsmuller tugs. Part of the cargo needed to be lightered, not only to provide the vessel with more buoyancy, but also create 'breathing space' for the cargo - as the refrigeration plant was out of order due to lack of cooling water. Expansion of the cargo would have led to a vent-off if no counter action was taken. The situation became tense and the Indian authorities invoked a 1950s law allowing them to marshal whatever resources they saw fit. The timely and professional intervention of salvors, however, resolved the situation. The vessel was refloated, discharged at the terminal and towed to the Persian Gulf for repairs.

SvitzerWijsmuller salvage teams are also trained to respond effectively in extreme weather conditions. Last November, a team responded to a major challenge at a shipyard at Harlingen - where a storm surge had produced a record-breaking high water and had pushed a chemical/oil tanker newbuilding over the quay. Hull 583 was left straddling a concrete jetty and dyke. The *Svitzer Marken* and the Noordgat tug *Hunter* were partnered by three local tugs for the refloating.

The hull was lightened and everything made ready for another extreme high water. The team then refloated the bow first. The fore section was then ballasted, lifting the stern and allowing a full refloating to proceed.

A similar task was undertaken three years earlier at a South Korean shipyard, when 'Hurricane Maemi' tore a newbuilding chemical/product tanker from the berth and pushed the vessel aground on the opposite shore at Tongyeong. This grounding resulted in significant bottom damage. SvitzerWijsmuller partnered a Japanese salvor for this operation, working under a Lloyd's Form. The vessel was ballasted to allow her to be manoeuvred into deeper water, with four tugs achieving the refloating. The hull was then redelivered to the yard, for repairs.

These assignments - involving all types of tankers, across a full range of emergency situations - demonstrate the importance of global salvage capability and, most importantly, the significance of human expertise in producing an outcome free of pollution.

The conclusion to be drawn is that emergency situations require a special type of experience. SvitzerWijsmuller and other salvage crews have this experience as they are engaged in emergency situations on a day-to-day basis. A timely intervention by experts can prevent matters getting out of hand. Any delay in professional intervention, however, can lead to a deteriorating situation, with more damage to ship, cargo and environment. TO

Hooking on for the future

Leading lifeboat and davit manufacturer Schat-Harding has completely re-engineered its range of on-load release hooks.

These new hooks are claimed to provide a safer solution and are less maintenance dependent than most of the hooks in use today. All Schat-Harding cruise tenders and lifeboats are already fitted with this new generation hook, complementing the second-generation hook designs fitted into the KISS and Freefall boat range. And from May 2007 all remaining types of boats will leave the factory fitted with the new hooks.

The second generation of hooks has also been retrofitted on some vessels.

"Current hooks all work to a design which has small safety tolerances, making them sensitive to lack of maintenance and with which it is hard to see if they are locked or not," explained David Bradley, Schat-Harding's group after sales and service manager.

"Schat-Harding's second generation hooks solve those problems. The new design concepts have eliminated the need for strict tolerances and have used corrosion resistant material on critical components, simplifying maintenance routines and improving reliability. The hook lock is either clearly visible or is fitted with a clear external indicator to show that the hook is closed correctly. There is no substitute for good maintenance by skilled personnel, but these hooks are as safe as it is possible to make an on-load release hook," he added.

Schat-Harding Freefall boats and KISS boats both have new hook designs based on the locked pipe system. In this system the tail of the hook is held in the locked position within a 3 - 5 cm deep steel pipe. It is clearly visible and can only be released by a 110 deg turn of the operating lever.

Conventional davit-launched boats are now fitted with variants of Schat-Harding's LHR hook range, based on a wearless cam system. The tail of the hook engages with the cam in the locking shaft when the shaft is in the locked position, and has 3 cm of contact area. When the on-load release is activated by rotating the locking shaft a roller in the tail of the hook contacts with the cam area, ensuring no need for tolerances and no wear on the assembly. This hook does not depend on close tolerances either during manufacture or use, and is also visibly safe because the open/close indicator is external and is integral to the locking shaft.

"Full failure mode effect analysis was carried out on the hook designs and both have now been in service without incident for some time. Schat-Harding's new hooks have been designed to be as safe as possible," said Bradley.

"We want the authorities to step up to the plate and begin strictly applying IMO MSC1206, which obliges owners to have their lifeboats and davits serviced properly by approved technicians. That will save a lot of lives. They can stop hiding behind the idea that some future technology can solve the problem of lifeboat accidents, that technology is here and in service. What we need now is authorities to oblige owners to have systems properly serviced and maintained in accordance with IMO Guidelines," he concluded.

Since various mergers and acquisitions, the company now has factories and offices in Norway, the UK, the Netherlands, Germany, Singapore, Spain, Canada, the Czech Republic, the US and China, plus agents in 30 other countries.

Brands supported by Schat-Harding include Watercraft, Waterman, Fiskars, Davit-Company, William Mills Marine, Schat, Harding, Mulder & Rijke and the Beiyang Boatbuilding Co. ■

Defence against marine spills

International Salvage Union (ISU) members recovered over 566,000 tonnes of pollutants during salvage operations last year.

During 2006, emergency assistance was provided worldwide for 233 vessels with cargoes and bunkers threatening pollution (a fall of around 6% on the 247 casualties recorded in the Survey for 2005).

The results of the ISU's latest annual pollution prevention survey show that oils, chemicals, other pollutants and bunker fuel recovered last year totalled 566,793 tonnes, as against 875,331 tonnes in 2005. This amounts to a decline of around 35%.

Forty of the ISU's 53 members contributed data for the latest annual survey. In 2006, ISU salvors recovered the following potential pollutants:

71% crude oil (and diesel oil)	400,581 tonnes (533,281 tonnes)*
1% chemicals	5,635 tonnes (60,147 tonnes)
15%,other pollutants (eg gasoline, slops, dirty ballast, etc)	88,313 tonnes (201,960 tonnes)
13% bunkers	72,264 tonnes (79,943 tonnes)

*2005 figures in brackets

Recovery of pollutants by marine salvors – 2006. Source ISU.

The volume of crude oil recovered saw a decline of nearly 25% on the 2005 figure of 533,281 tonnes. The recovery of chemicals, at 5,635 tonnes, represents a dramatic decline of just over 90% on the 2005 figure.

The volume of bunkers recovered in 2006 remained remarkably consistent with figures of recent years, typically in the range of 60,000-70,000 tonnes. In 2005 the figure was 79,943 tonnes; last year it fell back slightly, to 72,264 tonnes - a fall of about 10% on 2005.

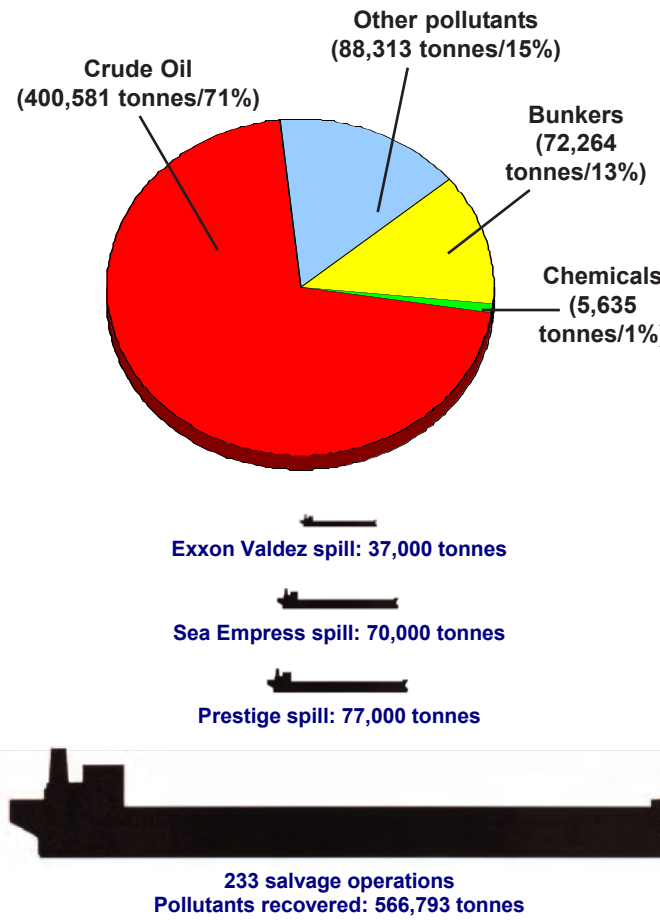
ISU President Hans van Rooij said: "The result of the survey for 2006 reverses the trend of increasing levels of pollutant recoveries seen in recent years. Nevertheless, the recovery of crude oil from casualties last year is the equivalent of over five spills of *Prestige* magnitude. While the number of tanker salvage operations declined sharply last year, there is certainly no room for complacency in the area of defence against major spills."

The ISU's pollution prevention survey began in 1994. In the 13 years to end-2006, ISU salvors recovered 13,184,630 tonnes of potential pollutants. This consists of 10,304,950 tonnes of crude oil (and diesel oil), 724,751 tonnes of chemicals, 894,042 tonnes of bunkers and 1,260,887 tonnes of 'other pollutants' (recorded as a separate category for the first time in 1997).

During 2006, there was a significant decrease in the number of tanker salvage operations - 18, as against 34 in 2005. The largest tanker service involved a crude carrier with a cargo of 145,396 tonnes of crude oil.

Last year saw little change in the number of casualties (tankers and other vessels) requiring the ship-to-ship transfer of cargoes and/or bunkers - 21 cases, as against 20 in 2005. The largest STS involved the tanker referred to above, which required an STS of the full cargo of 145,396 tonnes of crude oil.

The single most used form of salvage contract in 2006 was Lloyd's Form, used in 50 of the reported services (over 21% of the total number of assistances). There were also 44 cases using other forms of salvage agreement, such as the Japan Form. In addition, there were 11 wreck removal operations, 37 common law salvage claims and 91 services carried out on either a lumpsum or daily hire basis. TO



NOR SHIPPING

OPENING CONFERENCE
Tuesday June 12 2007
Lillestrøm, Norway

will SHIPS or PIPES RULE the ARCTIC?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TANKEROperator in Dubai

TANKEROperator's one day conference in Dubai on 18th April, with speakers from Emarat Maritime, NYK Line, Mid East Shipmanagement, Vela, Oasis Maritime, International Tanker Management (ITM) and ABS, was the scene of much lively discussion about how the tanker industry is evolving. Karl Jeffery reports.

The social side was not neglected.

The principal sources of concern continue to be demands from oil majors and the threat of criminalisation.

As far as demands from oil majors go, tanker operators are particularly worried about demands that seafarers should have spent a certain amount of time in rank before working on a tanker chartered to an oil major, and also that they must have spent a certain amount of time with the company.

It is easy to see how hard this is to achieve logistically, particularly for tanker companies which mainly charter out to oil majors, because they can never promote people; it is also hard for new tanker companies.

When confronted on these issues, oil majors always promise to be flexible, and take a closer look at how a company operates as an alternative means of assessing its suitability for charter than looking at how much time the seafarers have been at their current ranks.

Ranjan Mookherjee

According to **Ranjan Mookherjee**, ITM's operations manager, some oil majors have been explicit that they will not be choosing ships for charter just by number crunching. The numbers are just as a guide.

But do tanker operators believe them? There is also a lot of talk about oil majors assessing tanker operators by feeding all of the data into computer software, which determines which is the best tanker company to go for.

If you're a third party shipmanager, you may as well forget about trying to be anything other than level 0 in the TMSA environmental management section, said Mookherjee. This is because third party shipmanagers have no control at all over how the ship is scrapped, and this must be one of biggest environmental factors of operating a ship, he said.

The threat of criminalisation of seafarers continues to be a sticking issue, with most conference delegates saying they would not recommend that their own children go to sea, if they would face the threat of criminal action without a proper trial, as seafarers do.

Tom Allen, a US citizen currently serving as commercial and support manager with Vela International (Saudi Aramco's tanker arm), said he had been extremely critical of his own countrymen at a recent Mare Forum conference in New York.

Allen said he was pleased by the response he received from the US Coast Guard, saying that they recognised the problem.

But still, it is outrageous that after an accident, seafarers seem to get different rights from the citizens of the countries they are suspected of harming.

Allen suggested that an international seafarer bill of rights, put together on an international basis like the rights of refugees, is 'long overdue'. I don't think many readers of this magazine would disagree.

Duncan McKelvie, area representative of NYK, pointed out that the issue is by no means limited to the US and EU; he cited an example he had heard of from the Middle East, when a seafarer had a heart attack, fell down some stairs, and 15 seafarers spent the night in jail suspected of murder.

The criminalisation is certainly a safety issue, in that people who

might have the skills and abilities to run tankers safely might be persuaded to seek a career elsewhere. So there is no reason why the IMO should not get involved.

Captain Ravi Dey, manager of tanker operations and designated person ashore (DPA) with Emarat Maritime, said he thought that the industry has definitely improved over the past few years. "We don't see any more old tankers flying around," he said.

However like many in the industry, Dey does not see due credit from the public for its efforts. "What people see on the TV is what we do wrong, not what we do right," he said.

Captain Ravi Dey

"We are projecting the wrong image of the world - as an industry that damages and not an industry that builds."

"Tanker owners need to join forces and ensure that oil travels first class," he said. "Maybe we can meet in Dubai two or three times per year and solve problems on the track to excellence."

Dey said that he has had discussions with oil majors, who said that staff had to be with the company for two years, which was quite hard considering that Emarat Maritime is only one year old. "They said, we will invite us to your company and see if we approve you," he said.

He explained that at Emarat Maritime, the management accept that it is their problem if something goes wrong, rather than just blaming the ship. "Once you have the commitment from the top it has a cascading effect," he said.

The company organises crew into different groups, which all make periodic safety rounds of the ship, with 60 to 70 checks to make.

> "Building crew loyalty is of utmost importance...You care for your people, they stay with you."
>
> Captain Ravi Dey, Emarat Maritime

"Building crew loyalty is of utmost importance," he said. "We want crew to return to the vessels again and again. You care for your people, they stay with you."

The critical issues are "fatigue, stress, tiredness, relaxation," he said.

One tip from Dey was not to go too far with posters on board ship. "If I put up 100 posters, no-one will read it. If you put up one poster, people will read it," he said.

Dey said he defined risk as "anything which is not ordinary, routine work."

McKelvie, spoke about NYK Line's commitment to social responsibility (CSR).

NYK operates 720 ships, which counts as 1.5% of the world fleet. Some of the 720 are chartered in.

The company's emphasis on CSR grew from the company's "cultural tradition of honourable dealing," he said. It has been looking for ways to improve its social responsibility for many years, for example establishing a fuel economy committee in 1977.

"This company takes the shipowners view, it is the long view, never shorter than five years," he said.

NYK Line defines corporate social responsibility as integration of the interests of all stakeholders, including employees and the communities.

"Warren Buffet giving $31 bil to Bill Gates foundation is absolutely laudable, but its philanthropy, not CSR," he said.

"CSR is an ongoing process - a commitment generated for the company from the management down."

Typical CSR projects NYK implements includes reforestation projects in countries of the world, which the company carries woodchips from, and projects for seafarer's children.

Duncan McKelvie

McKelvie said that the complexity of the shipping industry can be used against the industry, for example after the *Sea Empress* incident, when people pointed out that it was crewed by Russians and spilled in Wales.

On the issue of SIRE inspections, McKelvie said, "we endorse anything that contributes to maritime safety, and that includes SIRE."

"We're quite ready for the inspections. They take up a lot of time but they don't perturb us too much."

"Seafarers admit, the inspector has a different perspective."

The biggest enemy of safety, McKelvie said, is the "enemy within - for example, an accountant or an auditor - a myopic sort of chap - who only sees this week's figures. This is a big enemy in shipping," he said.

"It's important that everybody has maritime knowledge and maritime experience."

McKelvie said he thought that the main reason the quality of tanker operations has improved in recent years is because owners have been forced to improve, due to regulations.

SIRE is another form of "policing from the outside," he said.

"Until owners start doing better policing from the inside, there will be a SIRE," he said. "There will be more and more inspections."

McKelvie talked about the informal tanker operator's safety forums in which he participates.

The latest event was the 119th meeting, and there are three meetings every year. "It works - everyone trusts each other and they are very honest," he said.

"Early on - they ejected the oil majors because they couldn't talk freely. Now people can say 'we had a shocking accident and the cause was...'"

Delegates to the forum often say that their accident investigations found that no risk assessment was carried out, and the cause of the accident is traced to commercial pressure, he said.

Mohammed Javed, Mid East Shipmanagement's quality, health, safety and environment manager said that the company, like everybody else, is "trying to find answers to the issue of paperwork."

"We have masters tied to their desks and unable to perform what they are paid for."

Javed had both compliments and complaints about SIRE. "SIRE has contributed in a very big way to the safety of the tanker industry. But there's a long way to go," he said. "They seem to be so subjective."

Recently the company had a problem arranging for a SIRE inspection for a brand new VLCC. She was engaged in lightering operations in a far flung part of the world which took 18 hours to reach in a launch, with no helicopter services available.

"We do see improvements in SIRE, in the way inspectors are advised to look at things, and I hope that's put into practise soon," he said. "I wish all inspectors were more objective."

"When TMSA was first introduced, I was a hardcore sceptic, I said, 'oh dear, here's another one'," he said. "As it progressed, I'm a firm believer, TMSA has done a great job."

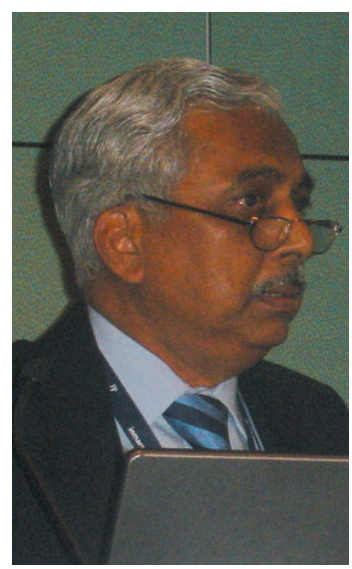
The company completed its first TMSA submission in July 2005, did its first revision in July 2006, and had its first oil major audit in November 2006.

While the company has strived to be absolutely honest in its TMSA submissions, there have been times when the company found that oil majors were looking at certain requirements slightly differently

Currently the company fully qualifies with level 1, and has a target to achieve level 2 in the next 12 months, he said.

Like many other tanker operators, Javed lamented the lack of dialogue between oil majors and tanker companies. "There should be a platform where we can talk to them," he said.

Javed said he was also scared about what could happen in the next few years due to the shortage of seafarers and people with seagoing experience.



Mohammed Javed

It is very important that shipping company offices have people with shipboard experience, if they are called upon to assist in an emergency. "Unless you have been in an emergency situation, how can you help the captain," he said.

Javed said he thought that "it won't be long" before ISM is replaced by TMSA, in effect replacing the standard shipping reactionary culture with a self-assessment culture.

He said that he was cynical about the idea of a 'no blame' culture. "A no blame culture sounds very lofty," he said. "If you do an accident investigation, you're trying to work out who's responsible."

Capt Subroto Ghosh, manager fleet operations, Oasis Maritime, said that it is ironic that while the maritime industry is going through unprecedented growth in the number of vessels being built, it is not trying hard enough to grow the number of seafarers able to man them.

"It is time for a paradigm shift in maritime human resources," he said.

There are many good reasons to be a seafarer today; the industry is booming, there is a big demand for people, and shipping companies are offering handsome wages and taking a long term view on human resources, he said.

"Experienced professionals are in demand for many shore assignments, for example with shipowners/managers, class, training institutes, regulatory bodies, drydocks, ship repairers, shipbrokers," he said.

"Numerous employment opportunities has accentuated high crew turnover, with negotiable wages and benefits."

However on the downside, crew performance is largely dependent on the ability to overcome fatigue, boredom and stress, he said. Crew demand is subject to cyclic variations. Crew

The panel of experts receive questions from the floor.

can be subjected to 'blame culture' and criminalisation. Crew training programs are mostly driven by regulatory requirements.

Crew face a lack of recognition, security and sense of belonging, he said. In one study, it was found that these three factors are more important to people than working conditions.

Seafarers may have limited career growth prospects, and there are often other career options which are more lucrative, financially and socially, over the longer term.

Ghosh noted that there is nothing new about the pursuit of excellence; even Aristotle had something to say about excellence, saying it is "not an art but a habit," and "we are what we repeatedly do."

The best way to help seafarers is by creating a "supportive, empathetic atmosphere, for inspiration, empowerment and motivation," he said.

It is important to have a culture where if someone's skills are not up to scratch, colleagues try to help the person improve them, rather than reporting him to the company management.

Ghosh cited the sevens model for excellence, covering "style, staff, skills, strategy, shared values, structure, and systems.

"Most successful companies work on the soft issues - style, staff, shared values, skills," he said.

"TMSA liberates an organisation from an autocratic approach," he said.

"Ships' crew must be employed, treated to promote a feeling of recognition and belonging," he said.

"You have to train crew to tackle fatigue and boredom. Boredom is tiredness of the mind."

Mookherjee, raised the question, which the industry does not want to answer. "Is TMSA a method for oil majors to evaluate and rank ship operators?"

He had his own answer. "If your numbers are not in line, there's no timecharter," he said. "Maybe you'll have a spot charter once in a while."

The 12 indicators in TMSA, he said, "were handed out to you by ExxonMobil."

"TMSA will evolve over time, I'm sure, like vetting," he said.

"There are some very good things here - but it is a performance evaluation," he said.

ITM uses a rule of thumb that it will have one major incident for every 600 near misses, he said.

The company is currently trying to determine how much control it should impose on vessels from the office, and how much should be given to the master and chief engineer.

One problem in recent years has been the enormous explosion in communications people have to deal with. "A cc doesn't cost anything," he said. "I blame ISM for this totally."

ITM conducts one internal audit and three visits by superintendents per ship per year.

"There is no alternative to visiting vessels," he said. "The management visits to the vessel are very important."

Mookherjee said that the company manages shipboard paperwork, in part, by using software tools such as Ulysses Systems Task Assistant, which can automatically present ship staff with the relevant sections from the manuals they need when they need it, rather than buying them under an impossibly big pile of manuals they are expected to read.

"We spend a lot of money giving these tools to the ships," he said.

Captain Steve Blair, head of safety, environmental & security certification ABS Europe, talked about how the standard of operating tankers is being gradually increased from ISM through TMSA.

He quoted Bob Malone, who, when head of BP's shipping division two years ago, said, "we are raising the bar for all of you and ourselves."

"Oil majors have a top tier of people who operate to oil major standards and do not require additional policing," he said.

The ISM system "achieved a lot," such as improved awareness of rules, and forcing the creation of a number of management systems, such as internal audits, system reviews, emergency preparedness and non conformity reports, he said.

Blair said he could divide shipping companies into three groups - gainers, complainers and painers.

"The gainers used it to improve operational performance," he said. "The complainers saw no immediate benefits and complain about the paper chase. The painers managed to obtain certification but still struggle to meet minimum requirements."

Capt Steve Blair

Answering questions about exactly when shipping companies should conduct risk assessments, Blair said there could be no hard and fast rule.

"You could look at it from the point of view of, how do you satisfy an oil major inspector," he said.

One delegate noted that many risk assessments comprise ticking a list of checkboxes, and nine times out of 10, the checklist is completed after the job is done. TO

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