

FORUM



THE CORPORATE MAGAZINE OF DET NORSKE VERITAS NO.2/2002



Statoil's clean sweep on safety

Petrobras charts new
deepwater course

Conoco leads the way
in safety management

Cancer centre adopts
environmental package

EU legislative proposals:
A view from Brussels...
and from OCIMF chairman
Jan Kopernicki

CONTENTS

- 3 EDITORIAL:** Quality and integrity mark concern for clients' real needs
- 4 STATOIL** starts with a clean slate in assessing plant and platform safety
- 8 PROCESS-PLANT** integrity is key to Conoco's business success
- 10 BRAZIL:** Petrobras builds on lessons learned from the P-36 ...
- 13 ...** while subsidiary Transpetro expands and upgrades the nation's pipelines
- 16 MARITIME TENTECH** develops FPSO design for the Gulf of Mexico
- 18 ANTI-POLLUTION LAWS** toughened in EU legislative proposals: a view from Brussels ...
- 21 ...** and from OCIMF chairman Jan Kopernicki
- 24 BOX-SHIP SUCCESS STORY:** continuing the Rickmers family traditions
- 26 MARENOSTRUM** expands ship-management skills and standards
- 28 NAUTICUS CONSTRUCTION:** New software for newbuilding process management
- 30 CANCER CENTER** adopts environmental package
- 34 LUCENT TECHNOLOGIES** gains DNV ISO 14001 certification for 'green design'
- 36 NEWS**
- 38 LAST WORD**
- 39 DNV WORLDWIDE**

DNV Forum is the corporate magazine of Det Norske Veritas

PUBLISHED BY
Corporate Communications
N-1322 Høvik, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 91 60

HEAD OF CORPORATE
COMMUNICATIONS
Tore Høifødt

EDITOR
Stuart Brewer

EDITORIAL CONSULTANT
R.Keith Evans

ADMINISTRATION
Gro Huseby

DESIGN
DNVE Graphic Communications

PRINT
Gan Grafisk, Norway

COVER PHOTO
Courtesy of Statoil

No responsibility is accepted by the publishers for statements made by authors, nor for attributable comment. Reproduction permitted with acknowledgement of source.

© Det Norske Veritas 2002

DNV (Det Norske Veritas) is an independent, autonomous Foundation working to safeguard life, property and the environment. DNV comprises 300 offices in 100 countries, with 5,500 employees.

Visit our website www.dnv.com



page 10



page 18



page 30



Miklos Konkoly-Thege

Quality and Integrity

As the newly appointed Chief Executive Officer of DNV, Miklos Konkoly-Thege has clear goals. 'It is our vision that by supporting our customers in their efforts to improve quality, safety and environmental performance, we can also enable them to realise their business objectives in general. In helping our customers succeed, DNV will also become their preferred supplier and thus an even more accomplished company.' Having spent the past 18 years in DNV, with wide experience in the industries it serves, Konkoly-Thege realises 'this is an ongoing task.'

The way he views DNV's goals, 'It's all about quality and integrity, and making sure that all our services are the best in their scope and application.' He explains, 'All companies subscribe to the importance of keeping their customers' needs in focus. For us in DNV this means that we must strive to understand what is important to our customers, and identify how best DNV can help satisfy their needs.'

'Take for example the offshore industry. In response to changing market conditions, with the safety of offshore installations becoming ever more regulated, DNV is actively developing both new and existing services. In addition to our traditional class role, we offer clients a wide range of relevant services: from life-cycle risk management and integrity management to safety, environmental and human-factor consultancy.'

Examples of the diverse services DNV provides to its clients across the industrial spectrum are included in this issue of *DNV Forum*. Says Konkoly-Thege, 'Our International approach, and the respect in which our offshore-related services are held, are well illustrated by the work we are undertaking in Brazil, where the oil company Petrobras is advancing even further its competence in ultra-deepwater exploration; and in the Gulf of Mexico, helping develop FPSOs for the unique sea and weather conditions met there.'

Growing international competition throughout industry is emphasizing the need to integrate safety, environmental and quality-related activities into production processes of all kinds.

'For DNV' says Konkoly-Thege, 'this means that the more our activities can be seen as part of the customer's value-adding chain, the greater the impact of our work for safeguarding life, property and the environment. This way we can help realise DNV's vision as well as every customer's business goals.'

STUART.D.BREWER@DNV.COM EDITOR

Statoil gets the



big picture on safety

Rather than drowning in paperwork and incrementally developed regulations and inspection schemes, Norwegian oil company Statoil decided on a clean slate. Using a new and comprehensive methodology co-developed with DNV, Statoil assessed the overall technical safety of all its installations, both onshore and offshore.

TEXT: KRISTIAN.LINDOE@DNV.COM

PHOTO: ØYVIND HAGEN, STATOIL

Says Geir Pettersen Statoil's safety director, 'We wanted to map more than hours of absence and numbers of incidents, we wanted the full picture,' he explains. 'We needed to know the current status of our entire inventory; but even more importantly we needed to assess the structural and overall safety of each platform's resistance to major hazards and risks.'

Until now, methodologies for overall technical safety assessment have been hard to come by. The methodology Statoil used in their assessment was carefully put together to reflect all the relevant regulations and international standards as well as Statoil's own corporate best practices. Says Pettersen, 'In the process of developing this system, the assistance from DNV helped us tremendously because of its competence and long experience. Also, using someone from the outside is valuable for the objectivity of both the method and the findings.'

SETTING THE RECORD STRAIGHT

He explains that in 2000 the Board of Directors decided to set the record straight in response to an on-going safety debate based more on feelings than on facts.

The debate was triggered by a number of Norwegian railway and shipping accidents, resulting in many fatalities. Questions arose about the safety level onboard the many oil and gas installations along Norway's coast. Reports about a trend of decreasing safety levels, combined with the alleged risks of ageing platforms, needed to be addressed.

The process of gaining experience about ageing installations only began once the ageing was happening, and therefore oil companies now want to have systems in place to learn in detail exactly what hazards/failure mechanisms are directly connected to the platform ageing process. >>



'Sharing both the methodology and the findings freely throughout the industry is the kind of action that promotes safety co-operation'

– Geir Pettersen

IN SUMMARY

- Until now, methodologies for overall technical safety assessment have been hard to come by. Using a new and comprehensive methodology co-developed with DNV, Statoil has assessed the overall technical safety of all its installations, both onshore and offshore.
- The methodology Statoil used in its assessment was carefully put together to reflect all the relevant regulations and international standards, as well as Statoil's own corporate best practices.
- After having initiated and taken the cost of such a mammoth task, Statoil invited all interested parties to take advantage of the project.
- Both the industry and the regulators have praised the project, as it enables assessment of overall technical safety, especially on ageing platforms.

SAFETY BARRIERS

One of the most important factor contributing to safety is the safety systems that function as barriers. If anything should go wrong, safety barriers must be in place and their performance in terms of functionality, integrity and vulnerability is essential to prevent the incident from developing into an accident. This can be described as a second line of defence.

Statoil has identified risks where 'sleeping' safety systems might be forgotten in day-to-day operations. This includes equipment for fire fighting that is to be used only in actual fires, meaning it is seldom tested full scale. Such systems might lose the everyday battle for attention among all the safety and production systems in daily use. Another objective of the project was therefore to ensure awareness and competence of safety-critical elements and safety systems as lines of defence.

Teams comprising technical specialists from both Statoil and DNV travelled to every single Statoil facility, onshore, offshore and in-between: pipelines, refineries, gas receiving terminals and product depots.

RANKING FROM A TO F

The assessment teams used checklists to rate all the safety systems on each installation. Each safety system was given a grade from A to F, where A represents a perfect system, better than any of the established best practices in the industry. The grade E denotes a non-satisfactory system, and grade F a system not passed.

On average, the Statoil facilities received good grades by the assessors. 14 per cent of the systems

were given an E, 25 per cent were given grade D, the minimum acceptable standard, while the remaining achieved good grades, C and above.

Using an ageing platform, Statfjord A, as an example of a typical old installation, grade E was given to some 20% of the safety systems on the platform; some 30% of the systems were acceptable, while the remaining were graded B or C.

The reason why an old platform like Statfjord A does not score higher is because the current accumulated knowledge, and hence regulations and standards, have evolved into substantially safer installation designs. In particular this reflects the fact that this generation of installations is much more enclosed than today.

The safety systems that did not pass the evaluation have been replaced or are in the process of being upgraded or replaced. However, this is only the beginning. From now on, Statoil will continue to carry out assessments according to the established methodology. Every year, one fifth of the technical safety barriers on all Statoil installations will be checked against the performance requirements developed in this project. Consequently, Statoil will have constantly updated information on the overall safety picture on all its installations.

THE WAY AHEAD

Statoil's proactive approach effects both Statoil and the rest of the industry. 'Being as open as we have with regards to the findings, we put pressure on ourselves to fill the gaps that were discovered in this project,' says Pettersen.

In addition, the awareness of and the use of the methodology are spreading to other players in the oil and gas industry. For example, Norsk Hydro has recently initiated an assessment project based on this methodology, adapted to meet its own needs.

Says Geir Pettersen: 'DNV will be assisting us also in follow-up work on this project. We want to make the most out of our investments. This means that we have to make sure that the safety level on our older installations is not only in line with laws and regulations, but as good as possible for platforms of up to 20–30 years of age. We will use the methodology and the findings in a scheme where correction of the non-satisfactory conditions will be integrated into our daily work. This will continue the awareness that was heightened during the assessment.' ♦

'Such a safety assessment is exactly the kind of approach we want the oil companies to take on these issues.' emphasises Gunnar Berge



Photo: Scanpix

SETTING THE BENCHMARK FOR INDUSTRY

Says Gunnar Berge, head of the Norwegian Petroleum Directorate (NPD): 'Such a safety assessment is exactly the kind of approach we want the oil companies to take on these issues. The methods used are well suited to address the need for information about overall technical safety. In particular the NPD appreciates the way they provide knowledge about the safety levels on ageing platforms.'

'For some time now, we have been looking into how we can make sure that what is reported are the most relevant and important facts. The project that Statoil has initiated is unique and it meets all NPD requirements and we have therefore actively supported it.'

In letters to operators in the North Sea as well as at international conferences, the NPD has pointed out that this is a good method that can be introduced to demonstrate to the authorities that action is taken to ensure safety of ageing platforms.

According to Gunnar Berge, there is an increasing need for such assessments: 'In general, we have seen trends indicating a decrease in the overall safety level, and now we want proof of the opposite from the operators before we can say that we are back on track. Also, we have had incidents in the North Sea where subsequent investigation has shown that the technical safety has not been up to the standards and not as good as at start-up, when the installations were initially approved.'

'The openness about the findings indicates a commitment from Statoil. For companies that are secretive about their safety status, the price to pay is lack of trust in their operations,' warns Gunnar Berge. ♦



The Humber refinery on the East Coast of England is a major site to have had a mechanical Integrity assessment by DNV.

A matter of integrity at Conoco

TEXT: BEATE.V.ORBECK@DNV.COM

Conoco has topped the American Petroleum Institute (API) annual safety survey for the fifth year in a row. The company's plant and personnel safety record comes from high leadership expectations, clear responsibilities and good tools. Conoco management recognise that being world-class in process safety is also essential for successful business.

Says Mark T. Korsmo, Manager Mechanical Integrity, Downstream Technology at Conoco Inc., 'It is possible to become over-confident in our work processes, after having earned the API's top safety distinction for 17 of the past 23 years.

'Being the best can be a real barrier to change. In our industry continuous improvements are a matter of business survival. Despite our good safety record, opportunities for improvement were discovered in the safety management system, which prompted us to demand even greater attention to process safety performance. This has resulted in a comprehensive assessment of mechanical integrity for all operating facilities worldwide.'

The improvement process started with an assessment of the mechanical integrity programme at 60 Conoco facilities, covering upstream and downstream activities during the past year. In this context, the main objective of mechanical integrity is to ensure that facilities, equipment and pipelines are designed,

constructed and operated throughout their life according to the original intent, with maintenance and inspection programmes matching both the risk and equipment criticality.

UNDERSTANDING THE TOTALITY

'Our attention to mechanical integrity is directed towards preventing serious process-related incidents that might injure people or the environment, or damage property,' says Korsmo. 'Previously, Conoco has focused very much on personal injury prevention. Now we are raising our focus on process safety to the same level we have on personal safety.'

'To address these gaps after a thorough review, we employed DNV to assess our mechanical integrity systems and processes. The scope of work was deliberately broad to include the assessment of a number of key elements, including leadership and management commitment, culture, management of change and risk assessment as well as more conventional asset

management, maintenance, and inspection programmes. Our approach is not something new and different, but we are taking advantage of new and more unified ways of using better tools and expanding our risk-based approach. To be able to make the best decisions we must understand the total risk picture of our operations – not only financial and personal safety matters, but also mechanical, operational and management issues.'

Ian McCulloch, the Conoco Upstream Lead, also clearly recognised the advantages of a risk profiling approach to plan the most effective and efficient Mechanical Integrity programme. This was a major finding of the DNV assessment.

LEARNING FROM MISSED OPPORTUNITIES

The same concept has been used on all 60 sites assessed worldwide. According to Korsmo this has been a good opportunity to create improvements across the upstream and downstream business units. 'The process has proved that, although the business units have perceived themselves as being different, in reality their strengths and weaknesses are similar. The risk-profiling approach recommended by DNV has provided a single way forward that covers both our upstream and downstream business. The new drive has reinforced the synergy between our two major activities and has provided valuable learning for all involved. We have not fully capitalised on opportunities in the past by doing things separately. In this assessment process, we have tried to collaborate more effectively between upstream and downstream, which we believe will make a better working process and a better total product.'

Led from the top, Conoco is now beginning to implement changes to deliver world-class mechanical integrity performance. In the downstream business, for example, this has involved working with each site

CONOCO

- Founded in 1875
- Operating in 40 countries – primarily in North America, northern South America, Western Europe and Southeast Asia
- 20,000 employees
- Net income in 2001: \$1,589million

to translate all findings from DNV into meaningful action plans. 'Regarding the assessment effort, it is now that the important work for Conoco starts,' says Korsmo. 'Each site has established its local implementation team. The implementation plans are being developed and will be in place by the end of 2002. The whole process is expected to take 2–3 years to complete. These improvements will also be consistent with, and advance Conoco's policy of, sustainable development by which the company conducts business to meet the needs of the present, without compromising the ability of future generations to meet their own needs.'

According to DNV's upstream and downstream project managers involved, this is one of the most rewarding consultancy projects DNV has been involved with. 'The success of this customised process has built upon Conoco's existing exceptional safety culture,' says downstream project manager Robin Pitblado. 'By extending this culture instead of trying to change it, Conoco knows it is deploying a proven strategy and one most likely to maximise success and speed of achievement. The potential prize is enormous, both in terms of future losses avoided and in enhanced production. It will be an important competitive advantage in the future, as well as reinforcing Conoco's core safety and environmental values.'

30 DNV employees have been involved in the project, with staff from the U.S., the U.K., Singapore, Indonesia and Finland. It has been a cross-business operation between DNV's Consultancy, Technology, Certification and Classification Units. ♦



'To be able to make the best decisions we must understand the total risk picture'

– Mark Korsmo



Petrobras charts new deepwater course

TEXT: CECILIE.LONE@DNV.COM
PHOTO: GERALDO FALCÃO

Last autumn Petrobras established its Operational Excellence Programme (PEO) to address offshore operational and safety performance. Moving forcefully on comprehensive safety measures, the Brazilian oil major is improving current operations while preparing for deeper waters.

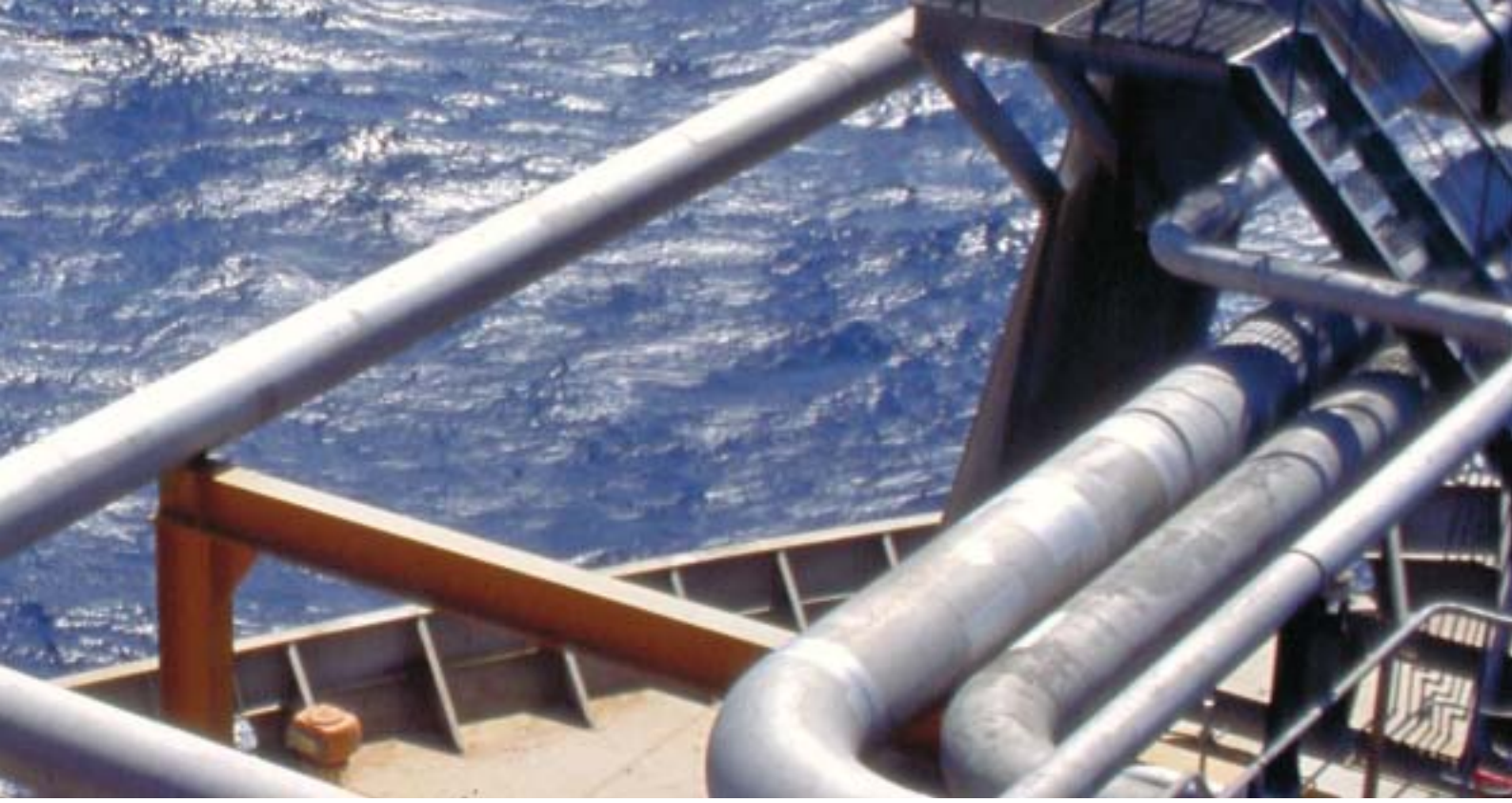
In his Rio de Janeiro office, Exploration and Production Manager, South-Southeast, Carlos Tadeu de Costa Fraga is seated in the midst of change.

Says Tadeu, 'First of all our challenge is to continue going deeper, developing and applying new technology. Second, it is to develop in total compliance with our safety, health and environmental policy at all times.' His words are already being put to the test. In the next three years, Petrobras will install six new floating production units.

To explain Petrobras' safety philosophy, Tadeu quotes a song familiar to all Brazilians, 'É qualquer desatenção, faça não, pode ser a gota d'água,' – not knowing which drop is the last one that will make a cup spill over, one should always be attentive. Lack of attention – even for a brief moment – might cause one to miss that crucial last drop.

LEARNING FROM P-36

Sometimes several drops combine to create a ripple, as was the case with semisubmersible P-36. In March 2001, an accident onboard the platform in the Roncador Field offshore Brazil caused it to sink. The



The PEO programme covers health, safety and environmental aspects of all Petrobras' offshore operations.

final Report concluded that not one single action or mistake caused the accident, and the avoidance of any of the main causes would have modified or completely prevented the accident. Says Tadeu, 'We needed to stop, reflect and behave differently. We discussed what we had learned with experts, what future incidents could occur, and created a programme to prevent such incidents. The PEO programme was initiated last November to improve the health, safety and environmental aspects of Petrobras' offshore operations.'

Strengthening the Class concept, guidelines and directives for the design of offshore production installations were also quickly approved and adopted.

Explains Tadeu, 'Improving safety is like everything we do. The lessons learned are an important part of the continuing process. It is all about cultural change. We are recognised experts on deepwater exploration. For us the P-36 accident was a shock. Petrobras had to restore a level of confidence: to bring back the morale of the entire company.'

Petrobras dedicated more than 80 senior experts to the investigation. About 20 worked full time. Their engineering skills were crucial in tests and simulations to determine the accident causes. Union representatives, and university and DNV experts supported the investigation committee.

Says Tadeu, 'To conduct an accurate investigation, DNV's experience of other major industrial accidents was invaluable. Since the platform was a total loss, the accident was much more difficult to reconstruct. DNV's expertise was critical in building the right methodology.'

>>

DEEPWATER EXPERTISE

- Concentrating efforts offshore south-eastern Brazil in the 1970s has left Petrobras with deepwater exploration know-how equalled by few.
- The huge Campos Basin hydrocarbon reserves have challenged Petrobras to a record depth of 1,853 m in the Roncador field.
- In 1997, the Brazilian Petroleum Act ended 45 years of monopoly for Petrobras. The company then realigned its organisation into four business units: Exploration and Production, International, Gas and Energy, and Supplies.
- Petrobras produces 1.6 million barrels of oil pr. day and aims to increase this to 1.9 million bbd by 2005. The Campos Basin is responsible for some 80% of Petrobras' production.



‘The right people with the right skills are what make a successful business,’

– Carlos Tadeu

IMPROVING SAFETY

At year’s end, the PEO programme will have implemented changes to engineering design, safety, ballast and stability, maintenance, operations and human resources.

Says Tadeu, ‘The investigation analysis revealed important areas of improvement, in addition to some not related to the accident. We put together these aspects in the PEO programme, addressing all operational areas: design guidelines, operational procedures, organisation, training and an Emergency Response Plan.

‘Common to all areas is that they are supported by attention to the human element. The right people with the right skills are what make a successful business. They are the ones who make the procedures happen.’

The programme affects more than 3,000 staff. Organisation has been pivotal. With fourteen main tasks to be implemented across business units, involving all Petrobras’ platforms in Brazil and abroad, responsibility needed to be divided clearly and delegated to each unit.

The central committee, of which Tadeu is a member, oversees project organisation and monitors the units’ implementation. Periodic audits are being performed according to a specific checklist protocol. Says Tadeu, ‘What is crucial during these audits is to look at implementation. Feedback is sent to senior management to allow for any changes to the implementation process.’

VALUABLE TRANSPARENCY

Petrobras has been extremely open with the P-36 investigation findings. Tadeu explains, ‘We adopted the attitude to be totally transparent from the start. In the aftermath, we have shared the report throughout the industry and conducted workshops in the U.K.,

Norway and at this year’s Offshore Technology Conference in the U.S.A.’

Involving its contractors is another Petrobras initiative. Says Tadeu, ‘We have initiated a programme inviting our contractors to participate in our environmental efforts. From an environmental, health and safety perspective, we are pushing them to adopt a safety management process. We provide them with support and allow them to improve. The suppliers who participate and do improve are termed “preferred suppliers”.

‘All our business units provide workshops for the suppliers to help them improve. If they don’t, they no longer do business with us.’

MANAGING IN DEEPER WATERS

Petrobras is moving now to greater depths with a broad base of technological know-how and safety programmes. In 2005, a semi-submersible to be called P-52 will begin production in the Roncador field, replacing the P-36 now resting on the ocean floor; its construction and future operations build on a foundation of hard-learned lessons.

And above all, the activities to improve Petrobras operations offshore have had a pivotal role in improving its ability to best manage future changes and challenges. ♦



Transpetro primes Brazil's gas pump

TEXT: CECILIE.LONE@DNV.COM
PHOTO: COURTESY OF TRANSPETRO

As Brazil tries to overcome power shortages, pressure is being placed on the country's gas pipeline grid. Transpetro is preparing for imminent change in the energy supply picture.

That Pão de Açucar is left in the dark at night – spotlights no longer illuminating the sugar loaf landmark in Rio de Janeiro – is a visible sign of Brazil's power challenge.

Recognising the need to reduce its reliance on hydropower, the government has turned to thermo-electric power plants fuelled by natural gas. Predictions foresee an increase in the natural gas share of the energy matrix from the current 3% to 12% by 2010. To the major oil and gas logistic company in Brazil, this is a major challenge.

Says Victor Celso Ferreira Ielo, Transpetro's general manager of gas pipelines, 'We are aiming to rapidly double the gas we transport. Today we handle 20 million cubic metres a day. In the next two years, we are preparing to handle 30 million cubic metres a day, and more than 40 million per day in 2005.'

Improvements are being made to Transpetro's present 3,000 km gas network. Expansion of the grid includes a new line between Sao Paulo and Rio de Janeiro, a new grid in the Northeast, and an interconnection between the two. New compression stations are also to be installed in the existing pipeline networks.



ENERGY TURNROUND

Internationally, the big oil companies are transforming into energy companies. For Ielo this is a positive move. 'You must move away from the old rules; the major oil companies are becoming energy companies. They have to look at alternative sources of energy. For Transpetro this is the best thing that could happen. Gas was normally considered secondary. Oil always came first. When Petrobras made the decision to become an energy company, gas was lifted to an equal first place with other energy sources.'

SERVICE PROVIDER

Transpetro is the direct result of the 1997 Brazilian Petroleum Act that opened the market to foreign companies. Complying with the deregulation laws, Petrobras established the subsidiary Petrobras Transporte S.A (Transpetro) in 1998. The logistics company took over Petrobras' Fronape ship management in January 2000, and the pipelines and terminals later the same year. It handles the transport and storage of bulk, crude, by-products and gas through pipelines, terminals and vessels of its own and third parties, plus construction and administration of new pipelines, ships and terminals.

Says Ielo, 'We have changed from a product-selling company to a service provider. A change in mindset has been important. Transpetro was born as a Petrobras company, but we are not restricted to work for Petrobras. When competitors are ready to transport their products, they can purchase capacity on Transpetro's infrastructure.'

ENSURING EXCELLENCE

Ielo manages Transpetro's gas pipeline grid. Together with the oil pipelines, Transpetro operates a 12,075 km network. Spread across 8.5 million square miles, a centralised safety approach makes perfect sense.

Petrobras as a whole has established a US\$1 billion safety programme called PEGASO, ensuring excellence in health, safety and the environment. PEGASO has a three-pronged approach, addressing hardware, procedures and human factors.

Transpetro is spending millions of dollars detecting possible leakages, weaknesses in the systems and other hazards. Says Ielo, 'We have made a major change in our supervisory system. Information from all the

'A good balance of technology, processes and people is crucial,' says Victor Ielo.

pipelines is fed to a central system, giving us an overview of all pipelines in Brazil.'

Ielo is referring to the newly inaugurated Operational Control Centre (COO) that centralises Transpetro's domestic network for oil and gas transport. The COO, whose basic concept was created entirely by Transpetro engineering, has two independent systems: the oil pipelines (petroleum and derivatives) and gas pipelines (natural gas). To check up on the gas flow – the quantity, quality or delivery – Ielo gets on the elevator in the Transpetro headquarters located in downtown Rio de Janeiro, stepping off at the 8th floor.

Here in the COO, operators at large computer consoles monitor all Transpetro-operated oil and gas pipelines, with the exception of supply lines belonging to third parties and ship loading and unloading lines at port terminals.

Explains Ielo, 'The system enables operators to open and close the valves controlling the flow of gas, adjust the quality and content of the gas, and conduct sales at the other end – all by the click of a button. In addition to optimising the planning and transportation of products, real-time monitoring of the network provides greater operational safety.'

The natural gas transported over Transpetro's pipelines comes from Brazilian and Bolivian reserves. 'We are looking to extend pipelines in other South American countries, and with this system, we will be able to control them from Rio as well,' says Ielo.

INTERNATIONAL BENCHMARKING

To identify current conditions, Transpetro relies on DNV in cooperation with Jardine. Says Ielo, 'We are now performing a reliability analysis of all our processes. This is a complete analysis, not just of the equipment but of all our processes from equipment

NEW ENERGY SOURCES VITAL

Diversification of the Brazilian energy matrix is progressing quickly. The vast river basins that currently provide 95 percent of the country's electricity yield limited possibilities for further development. An unusually dry summer in 2001 caused major power shortages all over the country throughout the year. A rigorous electricity rationing programme was established by the Brazilian Government, requiring a general cutback of 20% in power consumption by all users. Currently more than 40 gas-fired power plants are under construction.

to profit. We are trying to find out how reliable our assets and processes are.'

The aim is to benchmark the services Transpetro provides to clients. In addition, DNV is performing a Risk Based Inspection study of certain gas pipelines.

Says Ielo, 'Currently DNV is involved in the reliability studies of the gas pipeline networks. If this goes well, the plan is to expand to the oil pipelines. Preparing our company to go international, we are looking for global partners such as DNV. We are preparing our services for international benchmarking.'

As Transpetro prepares for future challenge, it is investing in a third dimension: people. Ielo emphasises that, 'Through the PEGASO programme, we have a broad focus on safety. A good balance of technology, processes and people is crucial. If you don't involve the staff, you don't have anything. They must be trained and aware of what we expect of them: to have a concept of safety instilled within them. You need more than just procedures on paper.' ♦

In the Operational Control Centre, the flow of gas is at the operators' fingertips.



Finding right form

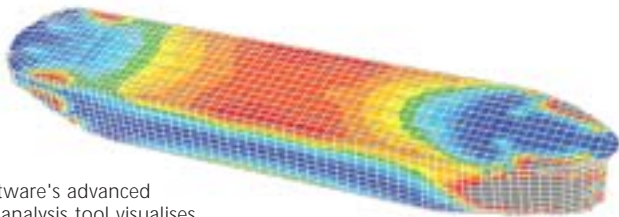
TEXT & PHOTO:
ANDERS.OVREBERG@DNV.COM

Floating Production, Storage and Offloading (FPSO) vessels are in demand. They are cost-efficient, movable and can operate in all conditions. Aker Kvaerner's Maritime Tentech is ready with an FPSO design for the emerging market in the Gulf of Mexico.

The continuing search for oil is taking the offshore industry farther out and deeper down. The increasing depths, inhospitable working environments and focus on cutting costs push the technological envelope for almost every new project. The FPSO is the perfect tool for the job. It's mobile since it has the hull of a ship, far-reaching because of its flexible mooring and riser systems, and cost-efficient in production.

HIGH STANDARDS

Maritime Tentech is a long-time user of DNV Software's FPSO design tools. The company, which is the FPSO product responsible within the Aker Kvaerner Technology division, specialises in structural design of vessel and turret, hydrodynamic analysis, naval architecture, marine operations, installation and offshore modifications, and more.



DNV Software's advanced strength analysis tool visualises a 3D model of the FPSO hull.

DNV SOFTWARE

is a commercial software house within Det Norske Veritas (DNV) which has done software development for shipping, offshore and process industries for over 40 years. DNV Software was established as an independent unit 1.1.2001 in order to concentrate DNV's software recourses in one business unit. DNV Software has 150 employees and more than 3000 clients in over 55 countries. For further information: www.dnv.com/software

Says manager Børre Knudsen, 'Half of the purpose-built FPSOs in the North Sea are of Maritime Tentech design. Currently we have seven FPSOs in production in the U.K. and Norway. FPSO operators in these waters have high demands for quality due to the tough weather conditions, and our North Sea FPSO design is of the highest standard in the business. It may cost more, but it saves the operators money throughout production.'

Maritime Tentech has used DNV Software's FPSO package for code checking, advanced strength assessments, hydrodynamic analysis and mooring simulations. Says Knudsen, 'DNV Software's tools are of invaluable help in our work, and they have played an especially important role in the development of our new FPSO design for the Gulf of Mexico.'

EMERGING MARKET

The Gulf of Mexico was only recently opened up for oil production using FPSOs. Maritime Tentech has used the experience garnered from work on its state-of-the-art North Sea FPSO design to make a cutting-edge design specifically for this emerging market.

Knudsen explains: 'The work has taken 18 months and considerable investment. As part of the process we approached ten U.S. oil companies and asked them what they were looking for in a design for the Gulf of Mexico. This input, coupled with our experience from the North Sea and the authorities' regulations, has given us enough information to create a generic design for the Gulf.'

For example, the U.S. operators requested that the vessel could be abandoned in case of hurricanes, which means it must handle well in response to waves and wind. The design therefore specifies no thrusters for heading control and an internal turret that is moved forward to improve weathervaning capabilities.

ula for US Gulf FPSO



Børre Knudsen (right), Maritime Tentech's manager, and Øystein Goksøyr, DNV Software's head of Business Development, share an optimistic view of the development of the FPSO market.

He is certain, however, that all of these problems can be overcome through planning and by using the right technology, such as a well-designed FPSO.

LIFECYCLE APPROACH TO FPSO OPERATION

Earlier this year DNV Software initiated co-operation with Industrial & Financial Systems Norway (IFS). The two partners combine maritime know-how and market-leading technology to develop

PRODUCTION FRIENDLY

A partner in this design process has been giant Korean shipbuilder Hyundai. Says Bård Leite, a Maritime Tentech designer, 'Together with Hyundai we have simplified the design as much as possible, focusing on the most cost-efficient solutions. The design is production friendly. It ensures a vessel with good sea-keeping, flexible solutions for top weights and ample storage capacity. It can readily be adapted to customer specifications.'

The design was concept-approved by DNV early this year, and Knudsen already has several parties interested. The U.S. Coast Guard, however, is waiting for the first test case, as the industry bides its time.

NEW CHALLENGES IN THE GULF

There are several problems connected with production in the Gulf, explains Knudsen, 'The ocean floor is very undulating and quite deep, reaching depths of 3,000 metres. The area experiences extreme seasonal winds and a strong "loop" current. In addition the authorities do not allow gas flaring nor re-injection into the ground, which leaves few options.'

a unique IT solution for proactive asset management for FPSO operations. The software solution combines DNV Software's tools for structural re-assessment and planned maintenance, with IFS's business applications for planned maintenance, logistics and equipment purchase.

Says Øystein Goksøyr, Head of DNV Software Business Development, 'The solution covers all phases in the life cycle of a floating oil production vessel. The knowledge gained from the design and construction of the vessel is stored in a database that provides powerful decision support and knowledge management for FPSO operators. This will offer them a higher level of maintenance that will minimise downtime in oil production without compromising safety onboard.'

This development will help progress FPSO design even faster. ♦



After Erika...

In our forum discussing important issues facing the maritime industry, Fotis Karamitsos, director of Maritime Transport in the EU Commission, and Jan Kopernicki, Vice President of Shell Shipping, give their views on the driving forces and effects of some of the legislative proposals drawn up by the EC – proposals that vitally concern a wide cross-section of the maritime industry.

... a new era for maritime safety

TEXT: KRISTIAN.LINDOE@DNV.COM

Do the European Commission proposals bring any good news for the shipping industry? Or is this a package of additions to a maritime safety regime that is better at establishing more procedures, paperwork and governing bodies than targeting the increasing problem of sub-standard shipping?



'You cannot even drive a moped without being insured for third party liability in any country I know of, but operating a passenger ship without insurance is apparently OK!'

DSays Fotis Karamitsos, Director of Maritime Transport and Intermodality in the EU Commission, 'We want to make seas safer and cleaner. At the same time we will make the shipping industry safer and cleaner.'

The principle of 'polluter pays' is reflected in the regulatory framework now developed or under development. How do you look upon the reality of this principle and to what extent do you think it can be enforced? Can it be enforced in the maritime industry if not in other modes of transportation?

'Sustainable development is a priority for the EU, and the environmental performance of modes of transportation is clearly of major importance to the environmental aspects of this. So, in the future, the EU will do what it takes to facilitate sustainable transportation and as such promote transport on rail and by sea. Railways are fine, but due to capacity problems, there are limits for development. Short sea trading, on the other hand, has potential, but suffers from administrative problems, inadequate port services and high port costs. These problems must be solved and at the same time we must establish other incentives, making short sea trading a more competitive mode of transport.

'Naturally, this will be part of a greater scheme where all modes of transportation will be priced in

accordance with their marginal cost to the environment. For example, SO₂ emissions from congested road traffic will be more expensive than for sea trade, which uses the free seas.'

Will this not have a negative impact on the shipping industry?

'The package that will come from EU proposing "charging" for the use of infrastructure will not be disadvantageous for shipping. On the contrary, it will benefit shipping, especially short sea trade. Compared to any other mode of transportation, shipping is the most environmentally friendly. The problem is the risk of pollution caused by grounding and spills of chemicals and oil. Therefore, we will take special action on this. Already our proposal for a supplementary fund for oil pollution, following the *Erika* accident, addresses this problem. We hope that an international solution will be agreed early next year.'

DRIVING FORCES

Since the *Erika* accident, through initiatives launched by the Commission, the EU has spearheaded new legislation that will improve safety at sea and prevent maritime pollution.

IN SUMMARY

- The sinking of the tanker *Erika* off the French coast in December 1999, with the loss of her cargo of heavy fuel, resulted in an environmental catastrophe in one of the most sensitive areas of the European continent. It raised searching questions affecting everyone in the industry
- At the core of the call for change lie the European Commission proposals for a post-*Erika* safety package which, if fully adopted, will have a far-reaching effect on all players in the maritime sector

A few examples of what can be expected:

- Control and inspection of ships in port will be extended and considerably tightened, particularly for older tankers
- Companies chartering substandard ships that are detained will be listed and exposed
- There will be faster phasing out of single-hull tankers
- In the longer term, financial liabilities might be substantially increased.
- The EC is also pushing to establish a European Maritime Safety Agency, primarily to ensure implementation of legislation by its member states through port state control and class societies.

What is the driving force behind these initiatives? Is it a reaction to the public demand for the politicians and the Commission to act? Or are these steps launched by the Commission as part of a strategy to meet the objectives of the EU to harmonise and unify legislation within the EU?

‘The driving forces of the new legislation are based on both a reaction to the *Erika* disaster with the need to improve maritime safety – as the old system had failed – and a strategy to meet the Union’s objectives to harmonise and unify legislation. The one does not exclude the other. The strategy also includes action aimed at improving the competitiveness of quality shipping. This in turn, is part of an overall strategy that eventually will make shipping a preferred mode of transportation within the EU.’

According to Karamitsos, maritime safety legislation in many areas is already in place, but its implementation and enforcement must be stronger and more effective. He thinks that the IMO to some extent is too slow, but he emphasises the importance of unified international legislation when addressing global problems. Nevertheless, the EU can and must act on its own in some cases.

How do the EU and the Commission intend to take this into consideration when formulating new legislation which will affect not only European shipping interests, but also the global shipping community?



‘I believe it is good that if the EU introduces new legislation to protect the environment, this affects shipping globally. This means that the EU can have a positive effect worldwide by raising standards in the EU area. Ships from other areas of the world will have to comply with EU regulations when they come into EU waters. This way we also avoid creating disadvantages for European shipping, as the indirect effect will be the same for the entire international shipping industry.’

‘We will try to go through IMO to update legislation and bring it up to modern requirements, as we did after the *Erika* sinking. This has been a positive experience and we have a preference for this model; however if it will not work we will have to consider what the EU’s interests are and proceed accordingly.’

EU SPEAKS WITH ONE VOICE

One objective of the EU is to promote an ever-closer union among its member states. The Commission’s recent initiative for the EU in its own right to become a member of IMO is a step in that direction. If so, how do you see the future regime for international maritime safety regulations?

‘With our forthcoming enlargement there will be more than 25% of global tonnage under EU flags. So we must be able to influence international legislation. We must protect EU interests and use to the maximum international processes to do so. We know that our accession to IMO will take some years to happen, with the current set-up of the IMO organisation.’

‘As to the voting argument, our member states will continue to have the votes they already have – nothing will change, as we are not asking for an extra vote for the EU. But it will be – whenever there is a community competence – a coherent position. Please note that decisions are taken by consensus in IMO and there is almost never any real voting taking place. This is one of the reasons why it takes time for IMO to decide on international standards and regulations. However, it is important for us that the EU member states speak with one voice in international forums. This way the EU can use its voting power in accordance with the power of its current 15 and later 25 or more member states.’

‘As to the future of international maritime safety regulations, I can say that there are areas needing further development. These will be addressed as a result of the EU’s organisational presence in international organisations.’ ♦



A catalyst for progress



As shipping vice president of Shell Trading and chairman of the Oil Companies International Marine Forum (OCIMF), Jan Kopernicki is well qualified to assess the EU Commission's legislative proposals. He insists that 'It is not a simple black and white case between the good guys and the bad guys – far from it. What we have is a successful intervention by the EC

which has resulted in the international discussion moving on far more quickly.' Holder of one of the most influential posts in shipping, Jan Kopernicki put his views to *DNV Forum* in London in mid-July.

TEXT: STUART.D.BREWER@DNV.COM
PHOTO: NINA RANGØY

I would first clarify the misunderstanding that Europe was in some way interfering with the normal shipping "jungle". In fact this has been a successful intervention by the EC which has helped to accelerate the international discussion. It is not right to criticise the European structure for causing a problem – this is far from true. Just look at what the EC has achieved in a very short space of time – it has addressed the issue of ship age fairly constructively, and caused IMO to re-think the phase-out timing of single hulls under Marpol 13. We in OCIMF are interested in achieving international solutions, because if you pass purely European regulations you'll quickly find that there are ships on passage that don't belong to any European country but which could have an accident in European waters. Any legislation restricted to Europe alone will not address those ships. An international solution is essential.

Hence I believe that the urgency that the Europeans have brought to this, sadly in part caused by the *Erika* incident, has been very helpful on the international stage. The EC has a timely opportunity to play a strong catalyst role in the international arena. It can get everything it needs and more for Europe using international mechanisms. It already has some valuable achievements behind it: the issue of the

retirement age of tankers has been resolved – it could be argued that this would have happened at some stage, but now it has been done. There are issues about better sharing of information; we have the classification discussion coming up. So much has been accomplished.

SHIPOWNERS MUST TAKE RESPONSIBILITY

OCIMF takes the view that we have to change shipowner behaviour if we are to significantly reduce the likelihood of oil pollution: one must recognise that OCIMF members charter only some 30–40 per cent of oil-tanker tonnage. The bureaucrats say that the IOPC Conventions are about compensation to the victims of spills – about funding but not about safety. They say SOLAS is about safety and the IOPC about compensation. These are separate issues in the eyes of the bureaucrats. My view is that you don't have to pay compensation if you don't have any accidents, so we have to stop the accidents happening in the first place. What we're trying to do, in the discussion about compensation levels and methodology, is to create a situation where the behaviour of individual shipowners is predisposed to safety, so that accidents don't happen.

>>



Though insured at the moment, the owner of a ship can just say, I've reached my level of responsibility under the international conventions. I've paid everything I have to pay. We have inherited a system designed more than 30 years ago. Now the sums involved are becoming quite large, but the main problem is that companies must pay compensation for spills that they had nothing at all to do with. In the case of *Erika*, for example, Shell is paying between USD 15–20 million as our contribution under the IOPC Fund Convention for something we were clearly not involved in.

COMPLETE CLARITY

Under the IOPC scheme, claimants are paid promptly by an international agency to which they have direct access. No company or individual need go to court; they can go directly to the IOPC Fund and present their claim. The IOPC has a very good record of paying in legitimate claims cases and today's system has the advantage that, under sometimes very different national legislations, there is complete clarity about who is responsible and who will pay.

OCIMF took the pragmatic view that we would intervene and support a supplementary mechanism that oil receivers would pay for, but with the *quid pro quo* that there should be a discussion about the overall structure of international compensation arrangements, in particular the CLC Convention, with the aim of increasing the participation of shipowners. We were concerned that the Europeans were in favour of a local version of this supplementary mechanism as a regional fund solution.

INTERNATIONAL SOLUTION

This would begin to undo the international mechanism that already existed – because we would see countries in the Far East, for example, looking at this European intervention and asking why they should belong to the existing international scheme. And there are some countries which, because of the enlargement of the current scheme, feel they should not pay for spills not of their making.

So, OCIMF intervened to fully support an international solution which we hoped would address European concerns adequately and would provide a supplementary compensation fund (provided initially by oil receivers). This we are progressing very quickly. Most importantly, we believe that shipowners need to be more involved. There are any number of mechanisms by which they could take a more realistic share of the responsibility for funding – for example by restructuring the CLC Convention – but this should not delay implementation of the Supplementary Fund.



'My view is that you don't

We strongly agree with the EC that this has to be addressed and we at OCIMF have had high-level talks with the EC and can sense a common spirit seeking to solve the problem. In order for this International Supplementary Fund to work, it must be a voluntary system, so countries opt in. We're very keen to have as many countries as possible opt into the supplementary tier. Therefore the entry into force criteria should not be set too high or few countries will opt in – we'll end up with one or two countries, probably European, opting in and other countries refusing. So, this is not solely a European discussion.

EUROPEAN MARITIME SAFETY AGENCY

It is difficult to conceive of the EC without an MSA and there's certainly scope for co-ordinating activities. One of the things that interests Shell as an oil company is the issue of the Paris Memorandum (PM) and the way in which countries use their PM rights to review ships. Some countries such as Britain and the Netherlands – and there are many others – regularly and rigorously inspect ships and detain them if they are of poor quality. I believe that countries such as these make a tremendous contribution to safety because they observe their PM obligations. The one thing that governments can do that companies cannot is to detain sub-standard ships and to advertise the detention publicly.

However, some other countries within the EU have much weaker coastguard structures. I believe this Safety Agency will act as a catalyst for national developments around Europe to achieve a more consistent PM framework. I suspect that this is a better model than having an overarching central system.





have to pay compensation if you don't have any accidents.'

The actual shape of the MSA is important, and to me, it would be better for it to be a catalysing, co-ordinating agency than an attempt to replace the national systems. It might be helpful in setting guiding norms: currently there are issues of co-ordination regarding standards and ports of refuge to give just two examples.

A more difficult question arises from that – whether the EU should have its own seat at the IMO. Also, should the EU have a block vote on behalf of European countries in its own right at the IMO Assembly? This is a very contentious matter, and the idea is one which has little support amongst many European governments. So we are a little way off a “United States of Europe” in the maritime area – for the moment at least.

The European Marine Safety Agency, once established, should perhaps see its role as a facilitator in addressing its currently agreed responsibilities. The Commission should move cautiously and enter discussions around added responsibilities with care. What we don't need is more regulation. The problem today is that companies fail to obey the current rules. We've got plenty of rules: SOLAS, MARPOL, Classification – they're all in place, and we certainly do not need more. What we do need is for these processes to deliver what the label says on the tin.

MARKET PERSPECTIVE

There has been concern that the EU could end up with fewer flagged vessels. But I believe there is little evidence to support this. It was evident after the *Erika* incident that a large number of substandard ships migrated away from some parts of Europe and went

elsewhere, which is an issue for multinational companies like us. We don't want to do business with these ships anywhere. But the market today is transparent right across the globe. In any case, most of the oil-market segments are over-supplied with huge ship building programmes. The market is going through one of its worst periods in over 10 years. So, in a sense, the discussion is slightly academic.

CABOTAGE RESTRICTIONS

A more significant problem is the cabotage rules in Europe. The Commission has these firmly in its sights, but there are some very unusual cabotage restrictions which preserve low-quality coastal operations in some European countries. We have seen, from the *Erika* case and others, that small ships can cause just as much damage as VLCCs, and coastal traffic falls squarely into this category. These cabotage restrictions also protect all tonnage not covered by IMO rules. We are very concerned, as are classification societies, about these cabotage-protected fleets. They're not good in an economic sense. They don't promote safety and there's always the risk of a substandard coastal vessel colliding with an international vessel. So again this is a matter for urgent international discussion.

In essence, though, I feel that the EC proposals are a catalyst to positive change, and will certainly help smooth the way for maritime nations entering the Union as part of its proposed expansion. However success will be measured by the extent to which international solutions are identified and fostered – the environment, after all, does not recognise political boundaries.'

Germans **box clever** in containership business

TEXT: ALAN THORPE

One of the most notable success stories in the development of the containership market has been the role played by Erck Rickmers, chairman and chief executive officer of Nordcapital and of E.R. Schiffahrt GmbH & Cie KG (both located in Hamburg) in the creation of new shipping and shipping-related ventures. He has continued a family tradition that stretches back five generations.

Nordcapital started its activities in 1992 and has since become one of the leading German KG ship financing institutions. In 2001 it became market leader, with approximately Euro205m equity raised. Erck Rickmers explains 'We do not use Nordcapital for raising finance for E.R. Schiffahrt alone; we have also realised projects with eight different German ship-owners (involving some 48 ships), including Bernhardt Schulte and Klaus Oldendorff, though E.R. Schiffahrt has become the main partner of Nordcapital in building up our current fleet of 39 containerships.

'In 1998 we decided there would be certain benefits for our investors if we developed shipping projects for ourselves. So we began putting this theory into practice by ordering newbuildings. Since the end of 1998 we will, by September 2002, have received a total of 15 post-panamax containerships from South Korea's Samsung Heavy Industries (SHI).'

AN EYE TO EXPANSION

Erck Rickmers is unlikely to rest on his laurels. 'Our strategy is to become one of the premier charter owners of containerships – we want to expand on what we have already built up. We have established long-term

One of the E.R. Schiffahrts fleet under construction at Korea's Samsung Heavy Industries.



business relationships with some of the largest liner companies in the world, including Maersk (Denmark), which has ten of our ships on long-term charter, OOCL (Hong Kong), which has six 5,700 teu vessels, and P&O Nedlloyd (three 5,700 teu). All our ships are on long-term time-charters; we have a shore staff of 47 here in Hamburg to operate the fleet.'

As a containership owner, with no diversification into other shipping markets, Rickmers is well-placed to forecast what future developments lie in the box-ship trade. 'We feel that the percentage of chartered ships in the large carrier fleets will increase, and we want to benefit from this. So we try to identify the carriers' needs and then agree the charter before ordering the ship.'

CAPITAL-INTENSIVE

'This increase in chartered-in tonnage is because sea transportation is only a relatively small part of the logistic chain (door-to-door) the charterer offers to its customers. It is capital-intensive and can be easily outsourced, in co-operation with quality partners such as ourselves. Many liner operators are now looking carefully as to where to invest, often not in capital-intensive sea transportation but in other areas of the logistic chain.'

'I believe that container transportation is a growth market. We will have growth rates in the range of 6-8% per annum over the next ten years. I also feel there will be a demand for even bigger ships than we see today. I see the largest design as a single-propeller, suezmax vessel, with a speed of around 26 knots, of around the 12,000 teu mark. Larger, twin-engined ships would not be economical. Faster ships would be a possibility on short-haul dedicated routes, but this will not be a major market.'

'Another development in the future may be that, while the market is growing, the carriers are looking for more direct calls. The problem with large ships is that they can only be economic if they spend a large proportion of the voyage at sea and avoid unproductive in-harbour periods. Carriers are now concerned about the costs involved in trans-shipments, so many are taking one step back and thinking more of panamax-sized (between 4-5,000 teu) ships, and direct calls. So, though the larger ships have been increasing in number, there is likely to be a future increase in the smaller (panamax) ships involving less trans-shipments and shorter transit periods.'



Erck Richmers (left) at the handing over ceremony for the *ER Denmark* at Korea's SHI.

OVER-CAPACITY A PROBLEM

Rickmers believes that there are too many shipyards in the world, with even more coming on stream in China. Cheaper ships, caused by over-capacity, can cause problems to residual values of existing fleets. However, if there is a demand for certain ship types, these can be built quickly, so there is unlikely to be a repeat of past fleet scarcity.

Hitherto, most of E.R. Schiffahrt's fleet of containerships have been classed with Germanische Lloyd (GL), however the latest four post-panamax ships from Samsung, all of which are on charter to NOL/APL, are classed with DNV. Rickmers explains 'DNV is the one of the largest and most reputable Classification Societies in the world, and although we have previously utilised GL on an exclusive basis, we believed it was important to establish a relationship with DNV as an alternative Society.'

The Rickmers family has been in the shipping industry for a long time. There are now two different sides of the family. Erck Rickmers' brother, Bertram Rickmers, operates Rickmers Reederei and Rickmers Linie, Erck Rickmers has built up Nordcapital and E.R. Schiffahrt. There is a glint in his eye when he talks about the growth of his two companies 'The highlight is definitely the series of 15 post-panamax ships. When I was a boy in Bremerhaven, where I grew up, my family owned Rickmers Werft. My father was in charge of the yard, and I spent much of my holiday time there. I thought the 580 teu ships being built then were truly impressive, and even ten years ago I never believed I would be involved in the building of 5,700 teu ships, and to have 15 such ships in our fleet. This is a great achievement and something we want to build on in the future.' ♦

Hoisting the quality sails

TEXT: STUART.D.BREWER@DNV.COM



Quality-conscious: From left, Soponata's Fernando Metzner Alves, head of shipbuilding, and managing director of Marenostrom, Armando Pinto Ferreira. Here with DNV's district manager Jose N. Oliveira.

Sights set on expanding its business as a technical operator, Lisbon-based Marenostrom now manages five oil tankers and a chemical carrier. Central to the company's expansion plans is its focus on quality systems to satisfy the most stringent flag and port state requirements and class rules and regulations.

Without denying its commercial connections to Portugal's Soponata Group, Marenostrom's strategy is to broaden its base by attracting other quality-conscious shipowners.

'Over the years, we have been building up our infrastructure to promote our quality management, philosophy and services on an international scale,' says Armando Pinto Ferreira, managing director of Marenostrom.

A solid infrastructure is important to quality ship management, and Armando Ferreira is determined that Marenostrom is to be representative of the best top-line technical ship management available to the industry.

The company has initiated several measures to achieve this goal. Upon its incorporation in 1992, it began working towards obtaining safety and management class certification with DNV. Accredited to DNV's SEP management system, Marenostrom now meets the safety and environmental requirements of international standards.

'SEP was the first step in establishing our long-term commitment to quality,' says Ferreira. He explains, 'Our approach and commitment to safety and quality management extend far beyond regulatory compliance with the International Safety Management (ISM) Code, as illustrated by the range of certification standards achieved by the company since implementing the SEP management system in September 1996.'

'Rather than regard the Code as one more piece of legislation to be complied with, we took advantage of the opportunity provided by adoption of IMO Resolution A.748 (18) to develop and improve our existing management system to meet measurable, recognised standards.'

'Consequently, we have been awarded ISM, DNV SEP and ISO 9002:1994 certification. The positive impact of implementing quality systems has been confirmed by a fall in the number, type and seriousness of incidents recorded by both ships and crew.'

STRICT MANNING REQUIREMENTS

As a major tanker operator, Marenostrom complies with all regulatory tanker operation and safety standards. As part of its service, the company regularly evaluates the manning, training and qualification standards on all its vessels. Its strict manning policy meets high international standards and its objective of having qualified and trained personnel both onboard and ashore.

'Every year, we monitor the qualifications and experience of officers and crew to ensure that standard requirements are being fulfilled,' says Ferreira.

Promoting a corporate philosophy of responsibility at sea through its quality-assurance procedures, Marenostrom is committed to first-class vessel maintenance. The company utilises the AMOS software package to regularly review all individual components of machinery, systems and tank areas on board. 'The vessels we operate have been approved by different oil companies and it is important to set high maintenance standards for each vessel,' Ferreira.

The fleet's technical off-hire totalled 110 days last year (100 days due to dry-dockings and major repairs plus 10 days due to technical failures and maintenance). Excluding the effect of the planned technical interventions and major repairs due to non-controllable causes, only 9% of the off-hire days were due to the breakdown or maintenance of main engines. The fleet's resulting average off-hire of 1.2 days/tanker/year is considered to be excellent and in line with that achieved the previous year.

NEWBUILDING EXPERTISE

In addition to its comprehensive operational management services, which include ship technical management, manning, quality assurance, purchasing, cost control and accounting, Marenostrom also undertakes newbuilding supervision.

'As a ship manager, we have know-how that is of value during design and construction, and this provides us with experience and contacts which subsequently benefit the operator of the vessels,' says Armando Ferreira.

Two new Aframax tankers are currently being built at the Sumitomo shipyards in Japan for the Soponata Group. These vessels will be added to the Marenostrom fleet later this year and increase the aggregate tonnage under the company's management to over 900,000 dwt.

Soponata recently purchased DNV's new Nauticus Construction Software, which uses the Nauticus 3D graphical model as a basis to support experts during the construction phase of a vessel (see article on page 28).

'This tool for newbuilding management and reporting is highly appreciated by our site team at Sumitomo,' says Fernando Metzner Alves, head of Soponata's shipbuilding division.

Marenostrom employs a staff of 16 widely experienced in the operation of tankers, bulk carriers, general cargo vessels and, more recently, chemical tankers. The company aims to develop into a medium-sized group with substantial in-house expertise.

Concludes Armando Ferreira, 'We like to give our principals a competitive edge, not only with on-the-spot advice and expertise, but also with quality services and solutions that protect them against a growing variety of risks.' ♦

The DNV classed *Erati*



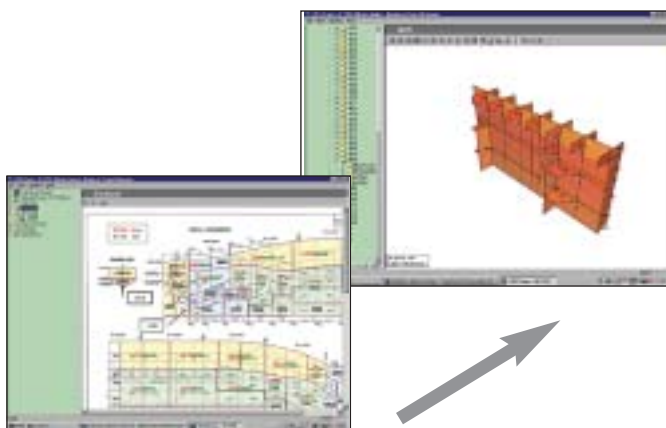
Nauticus Construction

covering all the angles of newbuilding projects

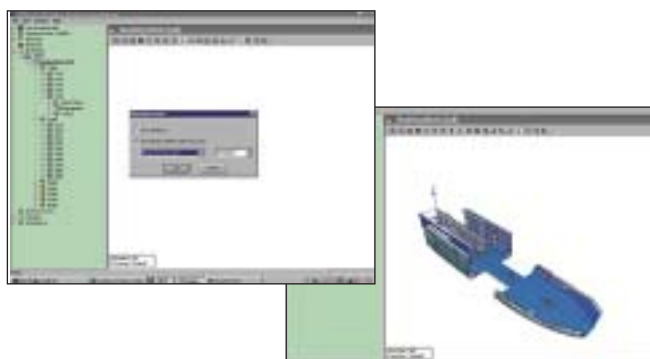
TEXT AND ILLUSTRATIONS:
DAG.ANDESEN@DNV.COM

DNV's Nauticus Construction is an IT application which combines Nauticus 3D hull block models of the newbuilding with easy-to-use templates for detailed project control. The hull block models enable the site inspection team to be better prepared, and the various templates linked to the models represent a single point for storing all essential project information.

Direct access from block division plan to 3D view of corresponding hull block. Choose between different view options to obtain details of steel grades or scantlings.



Generate 3D status overview of any milestone for inclusion in status reports. Chosen view shows 'blocks erected in dock' with status 'completed'.



Shipbuilding at modern yards is normally characterised by a high pace of construction progress. Typically, the complete construction period for a VLCC, from steel cutting to delivery, may be as short as nine months, with the bulk of hull blocks being produced within a span of 2-3 months. Considering that a VLCC may consist of up to some 600 hull blocks depending on yard standards, each with a number of scheduled inspections (typically 5-10) throughout the production period, a huge amount of information must be retained by the individual inspectors. In addition, if the project involves the construction of a number of sisterships such that production work on several ships takes place in parallel, then the call for overview and control becomes even more urgent. Though advanced yards with high production volumes also have good internal systems and routines for quality control and project management, most owners find their interests are best served by maintaining a strong presence on site throughout the building period.

NAUTICUS HULL BLOCK MODELS

The key to Nauticus Construction is a creative use of the Nauticus 3D Graphic Model, through splitting the model into individual hull blocks as defined in the newbuilding yard's block division plan. Each hull block model thus becomes an accurate representation of the actual hull block awaiting the site inspector's scrutiny, complete with detailed information on scantlings and steel grade for all essential structural elements. The block models can be viewed in any direction and by zooming in it is easy to see essential information on structural details.

For the site inspector this access to 3D models of the hull blocks gives an ideal opportunity to familiarise himself with the structure prior to inspection. True, the same information can be extracted from structural drawings. In practical terms, however, this would mean the scrutiny of at least three or four bulky yard drawings and trying to figure out the exact boundaries of the hull blocks.

SIMPLER USER INTERFACE

A central feature of the user interface is the established link between the yard's hull block division diagram and the individual 3D hull block models. Identification of the hull block models is based on the numbering or identification system used by the yard: simply clicking on the hull block in the block division plan takes the surveyor straight to the corresponding Nauticus 3D block model.

By spending some time ahead of the busy production period to copy different views of the 3D block models and other relevant document extracts into (for example) a Word document, the site inspector will have at his disposal a 1- or 2-page document containing critical and essential information such as:

- 3D overview of structural arrangement seen from different angles
- Scantlings and steel grade for all structural elements
- Comments from plan approval stage, focusing on critical areas
- Extracts from scanned structural drawings with additional comments/highlights if applicable
- Information on minor structural details as described in applicable Yard Standards.

It is, however, essential that such inspection plans are prepared well in advance of the actual inspection period. Normally, all relevant timetables for scheduled milestones and inspections are available from the yards well in advance, so provided the site inspection team is in place early enough the preparation of such inspection documents is straightforward.

ESTABLISH AND MONITOR MILESTONES

One of the first tasks is to enter all relevant project milestones into the application. Based on information in the yard's production schedule this can be done quite easily and the user can establish as many or as few milestones/due dates as he wants. The established milestones can later be modified to reflect changes in production schedules, or new ones can be added.

An updated overview of milestones will be generated daily, thus highlighting deviations from planned progress. An overall project overview report can be generated at any time.

Essential information can be entered upon completion of each inspection. Typical entries include:

- Inspection comments. These can be tagged with respect to severity, type of comment and status, thus enabling easy sorting/overview.
- Photos. An unlimited number of digital photos can be stored together with inspection comments for each hull block.
- Other documents. These might include sketches or extracts from drawings or any other relevant document.

The main focus of Nauticus Construction is on structural items and paint inspections. However, the reporting templates used are of a generic nature and can be used for any type of activity and stored under separate folders for outfitting work, NDT results and various other types of test activities. The 3D view models, however, are currently restricted to the hull blocks.

PROGRESS OVERVIEW

Based on comparison between the progress plan received from the yard and the updated status overview generated by Nauticus Construction it is a simple matter to maintain control and overview of the project progress. All relevant information, from detailed inspection comment status to overall progress, is stored in one place. For large site inspection teams this makes the task of the site team manager more manageable. By having all relevant information accessible in a readily understood format the chance of misunderstandings between the various parties involved is also greatly reduced.

STARTING THE SHIP'S LIFE-CYCLE DATABASE

Following completion, and as the vessel enters service, there may be much information from the newbuilding period an owner wishes to keep for later reference. This can be accomplished by assigning the class notation Nauticus Operation to the vessel. By doing this the global 3D Graphic Model is updated to reflect possible modifications to the structure which may have taken place in the course of building. At the same time, a selection of inspection data from the newbuilding project can be transferred to the updated model, thus forming a baseline for the ship's life-cycle database.

Nauticus Construction and Nauticus Operation are available to any type of ship classed by DNV, and the notation Nauticus Operation can be assigned to the vessel at any time. ♦



Cancer centre takes green lead

TEXT: CECILIE.LONE@DNV.COM
PHOTO: COURTESY OF UNIVERSITY OF TEXAS
M. D. ANDERSON CANCER CENTER

The University of Texas M. D. Anderson Cancer Center works to make cancer history. At the hospital, known for its holistic approach to cancer care, a newly certified environmental management system is seen as one way to further its mission.



M. D. Anderson is among the first hospitals in the U.S. to be ISO 14001 certified.

authorised the University of Texas to establish a hospital for cancer research and treatment somewhere in the state of Texas in 1941, the M. D. Anderson Foundation agreed to match the appropriated \$500,000 if the hospital was built in Houston and named after its benefactor.

BEHIND THE SCENES

A hospital is not a place that often comes to mind when thinking about waste, emissions and pollution. Environmental, Health and Safety Executive Director and Chief Safety Officer Linda Lee explains, 'M. D. Anderson, with its 13,000 staff and patients spread over 7 million square feet, is the size of a small town. Among the environmental, health and safety issues they are potentially exposed to here are small quantities of a wide variety of chemicals and radioactive materials. Likewise, because of M. D. Anderson's explosive growth, they are engaged in numerous construction activities. For years, the U.S. Environmental Protection Agency has had its focus on big organisations and chemical companies, but now there is a shift in emphasis that began in the late 1990s with the universities in the New England area.'

Lee is referring to the Federal agency's crackdown on hospitals and universities, forcing them to implement clean-up programmes. Says Daigneau, 'People work best not when they are coerced into doing something, but when they really wish to.'

M. D. Anderson managers aimed to elevate their Environmental, Health and Safety (EHS) programmes from compliance to a leadership level. Beginning with Daigneau's Facilities Management Division, areas targeted relate to energy and waste management. There are three main recycling programmes. In the chemical solvent recycling programme xylene, formalin and ethanol are reclaimed >>

Says Vice President for Operations and Facilities Management William Daigneau, 'M. D. Anderson is unique in that we have a sole mission: eradicating cancer. That is the focus of everything we do; everything is mobilised around this. There is a saying at M. D. Anderson: From the bench to the bedside. It means we should work to take the fruits of research and transfer it as quickly and safely as possible to help people.' This spring M. D. Anderson's 500,000th patient received care at the hospital.

M. D. Anderson was founded thanks to the philanthropic heart of a Houston cotton merchant, Monroe Dunaway Anderson. When the Texas Legislature



William Daigneau, 'Being a leader means one cannot afford to have someone who is not performing.'

and offered back to the laboratories. The municipal waste programme segregates, collects and sells for reuse paper, cardboard, aluminium and scrap steel. M. D. Anderson also participates in the Medical Bridges programme, which involves the collection of medical equipment and supplies for shipment to third world countries.

A COLLECTIVE MISSION

M. D. Anderson has left a trail of research milestones benefiting people everywhere. Today, its scientists are on their way to understanding many of the inherited or acquired flaws in various genes responsible for cancer. While doctors and researchers in their 900 laboratories are at the forefront, the contributions of all 13,000 employees are deemed important to the collective mission.

Says Daigneau, 'At M. D. Anderson we in Facilities Management are dedicated to excellence just as researchers and doctors are in their fields. The Environmental, Health and Safety group makes sure that we can operate safely for both patients and the community. When we treat patients, we must not create problems elsewhere. We do not want to create interruptions or cause problems to our mission. The challenge was not only to comply with regulations, but also to mobilise and implement best practices. We needed to create a system, and then validate and realise best practice in the EHS department.'

Linda Lee and her team decided that a certified environmental management system (EMS) was the best way for M. D. Anderson to leave a greener trail. She explains, 'We wanted to make it more system oriented. We attended an ISO 14001 overview session in March 2001, and decided that this was the next step in the evolution for us: to go for a more systematic approach. We felt that we had an effective programme, but we wanted to be as much a leader in environment, health and safety as we are in cancer research.'



Linda Lee (right) and Director of Environmental Quality John Gamble. As the EMS Co-ordinator, Gamble is a central player on the team that drives to continually improve the EMS through sustainability.





Sidewalk art: Through the Children's Art Project, worldwide sales of young cancer patients' art work fund programs that benefit patients and their families.

MANAGING THE ENVIRONMENT

Working with consultants Avery Environmental and The Solution Foundry, the M. D. Anderson EHS team began conducting risk assessments and regulatory reviews to target areas that had to be dealt with immediately, and identify issues for subsequent action.

Using an EMS to facilitate the process has helped M. D. Anderson organise and prioritise. Says Lee, 'We designed an EMS programme so we can grow into it. You must be aware of what you need to address, and it is easier to put in systems to detect, to prevent or minimise disasters when you have an EMS in place. A hospital is responsible for preventing accidents, releases and exposure to the community. An EMS is crucial here. You need to identify the risks and how to mitigate them.'

As a well-known figure in the University of Texas System, M. D. Anderson strives to be a community leader. Implementing an EMS has also made it easier for M. D. Anderson to comply with the requirements of state environmental programmes like Clean Texas and the Environmental Protection Agency's Performance Track programme.

FROM TOP TO BOTTOM

In establishing the EMS programme with the 1,000 Facilities Management employees, communication was key. Informational meetings and an EMS Intranet site were initiated. Explains Lee, 'Communication has not just been in the form of training, but more of a cultural approach saying that we care about the environment and people, and protecting their working environment. This also gives these employees a purpose in that they can make a difference in helping make cancer history.'

Integrating the environmental management system into the daily tasks of the staff was crucial to the success of the programme and ensuing certification. Says Lee, 'EMS expedites this, as it incorporates the entire organisational process. We dedicated resources to this work, getting the commitment of senior management: president Dr John Mendelshon, executive vice president Leon J. Leach, and William Daigneau. Top-level support is crucial, and that coincides with M. D. Anderson's philosophy. This is not an EHS department programme; it is the institution's programme. The workers make it happen.'

M. D. ANDERSON CANCER CENTER

- Opened in 1944 on the Baker Estate property in downtown Houston, Texas.
- Devoted exclusively to cancer patient care, research, education and prevention.
- One of the original three Comprehensive Cancer Centers in the U.S. designated by the National Cancer Act of 1971, and is one of 40 such centres today.
- Ranked among the top two cancer hospitals in the U.S. News & World Reports 'America's Best Hospitals' survey since its inception 12 years ago.
- Spends more than \$210 million pr. 1 year in research.

Daigneau adds, 'Anderson is recognised worldwide for its cancer work. But that also means it is crucial for all the support services to function. Being a leader means that one cannot afford to have someone who is not performing.'

EXCELLING BEYOND COMPLIANCE

M. D. Anderson is among the first hospitals in the U.S. to be ISO 14001 certified. M. D. Anderson received its certificate in December 2001. Certification was extended to M. D. Anderson's Science Park Bastrop Campus research centre in July 2002, and preparation for an OHSAS 18001 certificate has already begun.

Says Daigneau, 'Periodic audits make sure that our programmes are effective. They are a continual introspection into what you are doing according to current laws, regulations and practices. We do not spend money to get a wall plaque but because it helps us continue our path uninterrupted. We found a way to test our implementation of best practice. It is good business, consistent with our mission, and is a way to run the organisation in the best manner.' ♦

Lucent eco-friendly telephony technology

TEXT: CECILIE.LONE@DNV.COM
PHOTO: COURTESY LUCENT TECHNOLOGIES

To minimise environmental impacts from its base stations for mobile phone networks, Lucent Technologies Mobility Solutions Group has implemented a greener design process with the help of a DNV-certified ISO 14001 environmental management system focused on hardware product impacts.



Management and *Green Team* members at Lucent Mobility Solutions in Whippany, New Jersey.

When out driving, you have probably seen those tall aerial towers with boxes the size of a large refrigerator underneath. If you have a mobile phone, you have certainly used one. These boxes, or base stations, house the equipment needed to set up and complete calls on cellular phones.

A base station contains electronic components such as transmitters and receivers that work with your handset to complete a call. Designers must consider functionality, cost, government regulations and environmental parameters. One major manufacturer of telecom base stations is Lucent Technologies, headquartered in Murray Hill, New Jersey, U.S.A.

AN ECO-FRIENDLY PRODUCT

Lucent's Mobility Solutions Group is dedicated to design anywhere, manufacture anywhere in the world. Following a global trend, Lucent is moving away from in-house production. Outsourcing has meant that Mobility Solutions designers have less influence over the facility-related environmental aspects of base-station production. On the other hand, consumer-driven and legal eco-environmental requirements are becoming more stringent, and public concern over industry's environmental impacts is increasing.

This led Mobility Solutions to ask, 'where are our environmental impacts?' With about 6,000 employees in 16 countries, the only constants are the design



'Engineering concepts help cut environmental impact'

– Paul Mankiewich,

process and the product. This conclusion led to the development of an environmental management system (EMS), which is focused on hardware design rather than on manufacturing or facility operations.

Materials and energy consumption are factors that could impact the environment during the product's life cycle. A product-based EMS addresses how hardware products affect the environment regardless of where the product is developed. Says Environment, Health and Safety Planning Engineer at Lucent, Kathleen Donnelly, 'It allows us to systematically address the immediate and long-term eco-environmental impacts of our hardware products.'

'Product realisation ranges from concept to end-of-life, that is from the idea stage to when the product is taken out of service. At the drawing-board stage, developers can reduce any environmental impacts base stations would have after leaving Lucent. Working closely with the design and development community, we integrated product-based EMS requirements seamlessly with other, more traditional product development processes.'

FORMAL DESIGN FRAMEWORK

Through this ISO 14001 certification, Mobility Solutions ensures that hardware design innovations meet stringent legal and customer requirements. The product-based EMS has provided a business-wide formalised framework for managing the implementation and integration of environmental considerations into design, planning and business decisions.

Based on analyses of the areas that needed to be addressed – customer, legal, regulatory, environmental and other demands – an "eco-roadmap" was developed. This addresses product evolution in terms of sustainability and environmentally compliant product design. It is a supporting tool in the product's overall technology roadmapping process.

Design for Environment (DFE) principles have long existed in Lucent, but this is the first time they have been fully juxtaposed with other design principles.

Says Paul Mankiewich, Mobility Solutions Chief Technical Officer, 'Under DFE, we apply engineering

concepts to minimise the environmental impacts of each product's life cycle. We also seek product innovations that will meet or exceed cost and performance objectives while reducing pollution and waste.'

Life cycle assessment (LCA) is an important tool in the product-based EMS. It enables the evaluation of inputs, outputs, and potential environmental impacts of a base station throughout its life cycle, as well as reducing its cost.

The EMS elements audited include environmental policy, planning, implementation and operation, checking and corrective action, and management review. Initially, verification of the product-based EMS was conducted at five locations: Whippany and Mount Olive, New Jersey; Columbus, Ohio; Nurnberg, Germany; and Swindon, U.K. After 18 months of work by Mobility Solutions' Green Team, an ISO 14001 certificate from DNV marked the first milestone.

INTERNATIONAL TEAMWORK

The Mobility Solutions Green Team developed, implemented and maintains the product-based EMS. It includes individuals from a variety of disciplines, each of whom brings unique skills to this endeavour. Areas of expertise include product design and development, product realisation, DFE, ISO 14001, LCA, roadmapping, product conformance, quality and supplier management. Based in several countries around the world, the team members co-ordinate through conference calls and e-mail messages.

The Green Team's accomplishments were recognised as a Team Achieving High Performance through Lucent's internal company-wide team recognition process. Each team member received an acknowledgement from Lucent's CEO, Pat Russo for their 'strong commitment to environmental performance improvement.' 'Mobility Solutions continues to see the value of health, safety and protecting the environment,' says Mankiewich. 'We've proved that it's both good for the environment and makes sound business sense.' ♦



Enhancing supply vessel safety

DNV is helping develop guidelines for bridge design of offshore supply vessels, in co-operation with Statoil, Norsk Hydro and five Norwegian operators.

A supply-vessel bridge installation consists of a navigating bridge and a control position aft, from which operators control the ship when close to rigs or platforms, and operate winches and other loading equipment. The International Convention for Safety of Life at Sea (SOLAS) does not regulate the layout, so design varies to a large degree, often causing an imperfect working environment.

As for other types of ships, more than half the offshore service vessel accidents at sea are caused by bridge system failures. A majority can be traced back to technical design, and operational errors. The research and development project NAUT-OSV is a response to the offshore industry's safety concerns. Analysis of 24 incidents involving contact or collision between supply vessels and offshore installations owned or operated by Norwegian companies indicated that failures in the bridge system were often the cause.

The operator Farstad Shipping ASA began focusing on the man-machine interface when initiating a bridge arrangement and design project two years ago. Says Technical Manager Arild Egeness, 'We are pleased that standardisation of the bridge arrangement has evolved into a project for the general offshore industry. The objective is safety at sea, and with supply ship owners and charterers, with DNV as team leader, joining forces, we will be able to reach our common goals better, faster and more cost efficiently.'

The project will shortly be accessible at: [http:// projects.dnv.com/NautOsv](http://projects.dnv.com/NautOsv)

New software to speed shipbuilding

8 August, DNV Software signed a multimillion dollar software licensing and distribution agreement with the American software house Intergraph. DNV Software will exclusively market and distribute Intergraph's next-generation shipbuilding design applications to the shipbuilding industry.

Elling Rishoff, Managing Director of DNV Software says that DNV Software's ship classification and strength analysis software will be combined with Intergraph ship design software to provide an integrated suite of applications aimed at making dramatic improvements in shipbuilding design and manufacturing productivity.

'This is the first time such shipbuilding design software has been developed for and by the shipbuilders themselves in cooperation with a softwarehouse', says Anita Krohn Thrane, Director of Global Strategy in DNV Software.

The solution is jointly developed by the Global Research and Development (GRAD) consortium, which represents worldwide shipbuilders such as Samsung, Hitachi and Odense, and Intergraph Process, Power & Offshore. 'The constellation is unique, and with DNV Software as the exclusive reseller, DNV now has a great opportunity to differentiate itself from the other class societies,' says Thrane.

The solution will be presented at ICCAS in Malmö, Sweden, in September.

Helping keep tune for Yamaha

Founded in 1887 in Japan, Yamaha was originally a manufacturer of pianos. Over the years Yamaha has expanded its business into all types of musical instruments, audio equipment, semiconductors, golf clubs, automotive components, music and English schools, and sports and leisure vehicles. With 6,700 employees, Yamaha's net sales annually total around US\$4.4 billion.

Now the company has contracted DNV to carry out ISO 9001:2000 certification at five of its manufacturing sites – two in Japan, and one each in China, Indonesia and Taiwan.



Blue Stream pipelines in place



Installation of the world's deepest pipeline is complete. DNV has been involved in Blue Stream from the drawing board to commissioning.

Installing the two parallel 24-inch pipelines in up to 2,150m water depth has been extremely challenging. Blue Stream reaches well over 1000m deeper than any other main trunkline constructed. A novel installation system utilising the J-lay technique was developed and installed on board S 7000, Saipem's offshore construction vessel.

The pipelines were safely installed between Southern Russia and Turkey without significant incidents. They are now undergoing pressure-testing, cleaning, pigging and drying. Within a few months, the first gas is expected to reach the shores of Turkey, fastest-growing energy consumer in the world.

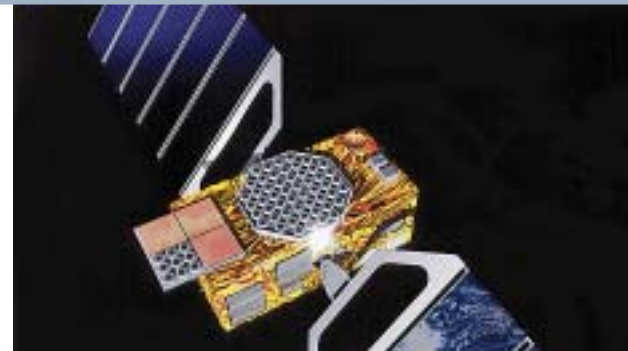
The Blue Stream project is a joint venture between Russia's OAO Gazprom and Snam SpA in Italy. DNV is certifying the pipelines and will follow the project until 'ready for operation'.

USCG officers train with DNV

The US Coast Guard is using DNV to educate auditors in advanced International Safety Management (ISM).

The US Coast Guard (USCG) is a military, multi-mission maritime service. The federal agency is charged with a broad scope of regulatory, law-enforcement, humanitarian and emergency-response duties.

The DNV-led course is an integral part of USCG's three-week Advanced Marine Inspector Training, and is designed to qualify the officers responsible for marine inspections, including Port State Control and ISM/STCW enforcement. Held at the USCG's Yorktown Training Center, the class covers ISM, Internal Audits and STCW-95 amendments, implementation and enforcement. It also aims to create synergies with other stakeholders in the maritime industry, including shipowners, operators, and Flag and Port State Control Administrations.



Guaranteeing signals from space

A comprehensive certification scheme will boost confidence in Galilei, a global navigation satellite system now under development.

As a participant in the Galilei consortium, DNV has been awarded a contract to support the European Commission (EC) and the European Space Agency (ESA) in creating a new environmental certification system suitable for Galileo. The ability to offer a guarantee of the availability and accuracy of the transmitted signals is important for the swift introduction of Galileo's services. This makes certification paramount, as it documents the quality of the signals.

Since no comprehensive certification regime for such a satellite system exists, the ongoing study led by DNV intends to identify best practice across industry sectors and combine them into a new regime. The scheme has to address software, hardware, processes and the human element.

By 2008, the Galileo system of 30 satellites orbiting earth will be able to determine a receiver's position to within 1 metre. Potential applications are foreseen in road, rail, air and maritime traffic control, synchronisation of data transmission between financial institutions, management and transport of dangerous goods, emergency response services, and environmental management.

Human factors are vital to safety

While systematic work on safe design, efficient production and other hardware issues have long been given the attention they deserve, human factors and organisational structures have not yet been exploited to their full potential. Gunnar Berge, director of the Norwegian Petroleum Directorate now demands that operators in the North Sea demonstrate a safety culture.

TEXT: KRISTIAN.LINDOE@DNV.COM
PHOTO: COURTESY OF NPD



‘Norway is the first country to introduce regulations that require companies to establish a safety culture’

– Gunnar Berge

‘Human factors have finally become recognised as an area where vast improvements can be made,’ says Gunnar Berge, director of the Norwegian Petroleum Directorate.

He is not alone in this prediction. Operators, too, are exploring the potential for improving safety by focusing more on human activity. Both Statoil and Petrobras believe that the importance of the human factor is so crucial that it must receive the priority hitherto accorded the technical aspects of safety work.

Statoil aims to ‘expand the knowledge of interaction between man, machine and technology.’ Because, the company says, ‘The misinterpretation of signals from screens and control consoles can cause major accidents.’

LEADS THE WAY

Norway is the first country that introduces in its regulations that the companies have to establish a safety culture.

The NPD has begun a project to look into the realities behind the popular term *safety culture*. This is an effort that will first affect operators in the North Sea, but pinpointing exactly what constitutes a safety culture will help operators everywhere improve their safety work. Companies struggling to achieve such a culture will reap benefits from others that show the way.

DOCUMENTED EVIDENCE

Regulators’ intuitive distaste for those who fail to adopt a safety culture may in future be backed by a demand for documented evidence. Demonstrating a company’s safety culture may well become integral to safety cases.

Today’s complex technology is so advanced and so expensive that not putting equal effort into the most crucial part of any machinery, the human, is a mistake that cannot be afforded. Oil companies that take advantage of the opportunities that lie in a holistic and human-oriented approach to safety work will be the ones that can maximise the bottom line.

DNV WORLDWIDE

CORPORATE HEADQUARTERS

Høvik (Oslo)
N-1322 Høvik
Norway
Tel: +47 67 57 99 00

ABERDEEN

Cromarty House
67-72 Regent Quay
Aberdeen AB115AR
United Kingdom
Tel: +44 (0) 1224 335000

COPENHAGEN

Tuborg Parkvej 8,
3rd Floor
2900 Hellerup
Denmark
Tel: +45 39 45 48 00

DUBAI

PO Box 11539, Jumeirah
Dubai
United Arab Emirates
Tel: +971 4 3526626

ESSEN

Businesspark Essen - Nord
Schnieringshof 14
45329 Essen
Germany
Tel: +49 201 7296 0

GOTHENBURG

Neogatan 4B
43153 Mölndal
Gothenburg
Sweden
Tel: +46 31 771 2600

HELSINKI

Nahkahousuntie 3
(Skinnyxvägen 3)
00210 Helsinki
Finland
Tel: +358 9 681 691

HOUSTON

16340 Park Ten Place
Suite 100
Houston, TX 77084
United States
Tel: +1 281 721 6600

KOBE

Sannomiya Chuo Bldg.,
9th Floor
4-2-20 Goko-dori
Chuo-ku
Kobe 6510087
Japan
Tel: +81 78 291 1302

KUALA LUMPUR

24th Floor, Menara Weld
Jalan Raja Chulan
50200 Kuala Lumpur
Tel: +603 2050 2888

LONDON

Palace House,
3 Cathedral Street
London SE1 9DE
United Kingdom
Tel: +44 (0) 20 7357 6080

MADRID

Campus Empresarial
Jose M^a de Churruga,
Edificio III, c/Almansa
105- 1^a Pta.- Ofic. 2
28040 Madrid
Spain
Tel: +34 91 4561600

MILAN

Centro Direzionale Colleoni
Palazzo Sirio 2,
Viale Colleoni 9
20041 Agrate Brianza (MI)
Tel: +39 039 6899 905

MUMBAI

Emgeen Chambers, 10,
C.S.T. Road,
Vidyanagari, Kalina
Mumbai 400098
India
Tel: +91 22 6160909 / 6124606

NEW JERSEY

70 Grand Avenue
Suite 106
River Edge, NJ 07661
USA
Tel: +1 201 343 0800

OSLO

N-1322 Høvik
Norway
Tel: +47 67 57 99 00

PIRAEUS

26-28 Akti Kondyli
Piraeus 18545
Greece
Tel: +30 1 41 00 200

RIO DE JANEIRO

Rua Sete de Setembro,
55/17 Floor
20050-004-Rio de Janeiro,
RJ, Brazil
Tel: +55 21 517 7232

ROTTERDAM

Haastrechtstraat 7
3079DC Rotterdam
Netherlands
Tel: +31 (0) 10 2922600

SEOUL

Room 2110, Kyobo Bldg.,
1, 1-KA,
Jongro, Jongro-Ku
Seoul 110121
Republic of Korea
Tel: +82 2 734 7327

SHANGHAI

House No. 9,
1591 Hong Qiao Road
Shanghai 200336
China
Tel: +86 21 6278 8076

SINGAPORE

DNV Technology Centre
10 Science Park Drive
Singapore 118224
Singapore
Tel: +65 779 1266

STOCKHOLM

Warfvinges väg 19B
Box 30234
10425 Stockholm
Sweden
Tel: +46 8 587 940 00

SYDNEY

Level 19, Northpoint
100 Miller Street
North Sydney, NSW 2060
Australia
Tel: +61 2 9922 1966

DNV PETROLEUM SERVICES PTE LTD

27 Changi South Street 1
Singapore 486071
Tel: +65 779 2475

DNV INTERNET HOME PAGE

www.dnv.com

OFFSHORE INTEGRITY

Over three decades, since the first discoveries of North Sea oil and gas, Norwegian oil company Statoil has been in the forefront of exploration and production technology.

Throughout this time, too, Det Norske Veritas has worked closely with the world's oil majors in helping ensure the safety and integrity of hydrocarbon facilities both land-based and offshore.

Today, as safety and environmental laws grow tougher and more extensive, DNV works closely with Statoil – and with the oil, gas and process industries worldwide – in evaluating, documenting and certifying the safety of their plant and operations.

