Safety last
Mistakes during sampling lead to dangerous loss of VCM from gas tanker about to discharge, investigators find
21

Strong support

CONFERENCE REPORT The first StocExpo conference and exhibition got underway in Rotterdam to a mixed reception: some felt it could have been condensed into two days while others reckoned there was a good turn-out for a first show. In addition, however, there were some interesting presentations from senior industry figures

StocExpo, the conference and exhibition for storage equipment specialists and service providers, was held this past March 1 to 3 at Rotterdam's Ahoy' conference centre and seemed to get off to a good start with a great effort coming from the exhibition organisers to ensure its smooth running. As a result there were few of the usual grumblings about missing chairs, tables and carpets in the exhibition hall. So far, so good. Unfortunately the weather was not on the side of the organisers and a heavy snowfall persisted over most of the three-day event, making it difficult for some to attend.

However, more than 1,110 intrepid souls braved the cold to visit the show and attend the conference sessions, and even though it seemed at times the exhibition was short of visitors, there was the general feel by most that it was a fair turn-out and several reported that, while they had not seen as many people as they might have expected, those that were there were exactly the right people they wanted to see.

These quibbles are minor, however, and the organisers are confident that next year's event, which is already scheduled to take place in Rotterdam on March 28 to 30, will be even bigger than this year's. Stand space, for instance, has been expanded by some 50 per cent and over half is already committed to repeat exhibitors.

Baltic movement

The conference opened under the august chairmanship of **Richard Kellaway**, managing director of Kaneb Terminals UK and a leading light in the Federation of European Tank Storage Associations, which had thrown its support behind the event. Among those he introduced was **Peter Hills**, UK representative of Nordic Storage, who presented a paper on the role of the independent tank terminal in the oil and chemical industry with reference to Nordic Storage's own experiences in that area.

Hills pointed out that there are five main areas of operation the terminal has to oversee: distribution and inland marketing, building or breaking bulk cargoes, blending, contango storage and compulsory inventories. This last mentioned function might seem unimportant but, Peter said, as oil demand grows in developed countries, there is a greater need for strategic stockholdings. Such a function needs to mesh with the other services the terminal offers to its commercial clients.

Looking more specifically at the Baltic region, which is where Nordic Storage operates, Peter said that a lot of facilities are acting as transhipment terminals, bulking cargoes coming out of Russia. There are two main shipping constraints in this region, according to Peter: the first is the ice conditions, particularly in the Gulf of Finland towards Russia, where long-haul shipping is restricted; the second is the draught limitations in the Baltic waters - some vessels are unable to exit the Gulf fully loaded. This means that all the terminals in that area need to understand the way the oil trades are working if they are to accommodate changes in trade and distribution specific to that area.

The unusual nature of the Baltic market was illustrated by figures from **Antti Laaksonen** of Baltic Tank, who said that his company handled 5.6 mt of cargo last year, of which 2.6 mt was imports and 3.0 mt exports.

In order to enhance its existing operations the company started to think of new solutions to combine liquid and dry cargoes and to improve transport logistics. Both liquid and dry bulk cargoes travel by road in Finland in large trucks but there are restrictions on some cargoes such as caustic soda. There is the potential to move a lot of this transport to shortsea vessels but, Antti commented, this would require a large investment.

There are other obstacles. Firstly, although chemical importers are often exporters of dry bulk goods, the two kinds of product cannot necessarily be transported in the same tanks. Furthermore, many of Finland's larger factories are located far inland and therefore rely on road transport.

In the afternoon session, **Jan van de Geest**, senior civil engineer of Shell Global Solutions, talked to delegates about tank risk and reliability management (T-RRM), a structured approach to storage tank management. He said the T-RRM approach has been designed over a number of years, with a number of exercises carried out to check it is viable. This has been done because of a need for proper maintenance of all assets at the terminal, including the tanks, tank roofs and level gauges.

This need for tank maintenance has sprung from a growing environmental awareness, which has translated into a need for more regular or accurate tank inspection, at a time when costs are also under pressure. Risk based inspection (RBI) and reliability-centred maintenance (RCM) have been applied successfully, but they are particularly focused on production and not so much on tank maintenance.

Jan said a primary objective of T-RRM is to optimise shutdown intervals. To do this it is necessary to look at everything on the tank, right down to the stairways, walls and rivets. It is

Exhibitors at StocExpo were, on the whole, happy with the event

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probably better to have the inspection of these elements embedded in the maintenance procedure. In order to implement the procedure it is necessary to have good hardware and to look at each component and what might go wrong with it. The inspection has to include the inside of the tank as well as the outside, he stressed.

How technology can help

The last two sessions of the day involved papers on the use of technology in terminal operations. **Mustafa Selçuk**, deputy general manager of Solventas Technical Storage Co, talked about web-based technology solutions for supply chain management.

Mustafa pointed out that use of traditional forms of communication, such as telephone and fax, is a waste of valuable time and can lead to errors. By using the web-based platform it is possible to communicate in real time in an easy and effective way and avoid mistakes. Solventas uses web-based technology at its terminals, including management internet automation (MIA), which gives it full, real-time control of the terminal equipment.

All links in the supply chain collect different data which is available to all parties involved and can be accessed via secure internet connections. For example, a forwarder submits driver information, which is then put into the system, and is available to the other parties in the chain via the internet. According to Mustafa the advantages of this kind of system are that everything is more visual, it works in real time, it is understandable and manageable, and flexible to adopt. Costs are reduced, revenues improved and customer satisfaction is maximised.

In the final paper of the day, IT project manager **Michel Segers** and terminal manager **Frank Devoght** of Belgian Refining Corporation talked to delegates about terminal automation solutions. Frank gave a quick overview of Belgian Refining and explained it operates 90 storage tanks with a total capacity of nearly 1 mt, berthing facilities for vessels of up to 120,000 dwt and 22 cargo platforms for train and truck loading. It handles products such as propane, butane, naphtha, gasoline, diesel, gasoil, fuel oil and feedstock. Seventy per cent of the products refined at the terminal are exported to North America, with the remaining 30 per cent for the Belgian market and other traders.

Belgian Refining had set up a number of operational and safety targets at its truck loading terminal. It wanted unmanned loading, 24-hour a day services and immediate and accurate stock control, to minimise the need for data entry and provide an open interface with tailor-made solutions.

Michel explained that Belgian Refinery uses two different systems: one is a tailor-made system called management of automatic loading rack (MALT); the other is an off-the-shelf terminal automation system from FMA Systems. One of the major goals of installing the system was to have a reliable and effective means of running the terminal. Michel explained that, if the link is broken with any of the sites, customers must be able to access their own information. Belgian Refining has managed to maintain this level of communication between all applications and keep customers happy.

Wading through

The second day of the conference, chaired by the **Bulletin**'s editor, **Peter Mackay**, was disrupted by the weather, with two scheduled speakers unable to make the trip. Nevertheless, there were some interesting – even vital – presentations for the terminal industry, the first of which came from **Ineke Jansen**, BREF coordinator at the EU's Integrated Pollution Prevention and Control (IPPC) Bureau in Seville, Spain. Her task was to explain to delegates the intricacies and implications of the EU's IPPC Directive, the concept of best available technologies (BAT) and the development of BAT reference documents (BREFs).

The bulk liquid storage industry is not explicitly covered by the IPPC Directive, Ineke said, but effectively it will have to comply with the requirements for emissions abatement and various representative organisations have already played a large part in drawing up a list of BATs in use across Europe. Based on this, the EU accepted the storage BREF in December 2004, which covers:

(a) solids, liquids and liquefied gases;
(b) all kinds of storage modes;
(c) transport and handling techniques;
(d) process control techniques;
(e) abatement technologies; and
(f) safety.

The storage BREF is unusual, Ineke said, in that it is 'horizontal' in nature; most of the other 32 BREFs are vertical, covering a particular industry. The aim of each, however, is to identify the main emission sources and to prioritise appropriate abatement techniques. These are listed in Chapter 3 of the BREF, which gives more than 90 emission control measures for storage and more than 30 for cargo handling. The BREF does not, however, set emission reduction targets, which have to be enacted by each state. What it does do is provide a 'scoring' system that allows the permit writer and the terminal operator to establish the appropriate BATs for each facility, taking into account the costs involved.

Despite all the work that has been going into the IPPC system over the past few years, Ineke said that some countries are not happy with the results. She felt that this was probably because they felt the system has become too complex. Those who need to know more – which includes most terminal operators – were directed to http://eippcb.jrc.es for more information.

The economic implications of the application of BAT to the storage industry were considered by **Dario Soria**, a consultant to the Italian tank storage association Assocostieri. Although few in the audience found it easy to follow his analysis, he ensured them that a cost/benefit analysis is part of the process of BAT application. Furthermore, depending on the competitive structure of the industry, some of the additional costs may be passed on to the customer. Some technologies may bring cost savings but, overall, additional fixed costs are likely to emerge, which will mean that terminals will have to increase throughput.

It is not easy for non-financial people to apply these techniques, Dario admitted, and this category is likely to include permit writers. However, there are some simple analyses that can be applied.

How such programmes are applied in practice was the subject of the next paper, from **Marten de Hoog** of the licensing department at the Netherlands' Environmental Protection Agency (DCMR) in Rijnmond. He remarked that storage terminals have been good at complying with environmental regulation and that ISO 14001 has proved a useful standard for demonstrating management responsibility. However, he said, closing the management cycle could be improved: companies need to learn from and improve their environmental management systems. Procedures on the work floor are not 'waterproof', he said.

There was a worrying increase in major incidents in the Netherlands in 2003, some of which were in the tank storage sector, and DCMR has laid down a set of ambitions for improvement. This will involve better supply chain management, ensuring that all emissions are treated (although not necessarily via the BAT route), introducing safeguards to protect against soil contamination, and improvements in energy efficiency.

DCMR does understand, Marten stressed, that the storage industry works under cost constraints and, furthermore, needs a level playing field. He remarked that there is a clear difference in safety performance between dedicated and multipurpose terminals; the former tend to be more closely involved in the supply chain and work under longer contracts, so allowing better planning. Multipurpose terminals may have to apply a greater number of techniques for improving environmental performance, he suggested. Marten also stressed the environmental benefits – as well as economic attractions - of

Some had difficulty getting to Rotterdam

storage

Next year's event is already booking up fast

clustering industry, which promotes communication and the flow of information.

In the Netherlands, volatile organic compound (VOC) emissions were successfully reduced by some 70 per cent in the 15 years to 2000. A second agreement was due to be published around the time of the conference, aiming to have all storage tanks vapour-treated by 2020 at the latest. However, he concluded, it is not possible to take a national approach on this; it needs to be Europe-wide.

HSE and HNS

Martin Whittle, general manager of the Chemical Distribution Institute (CDI), reviewed the development of environmental and health and safety at work legislation. Health and safety came first, but the introduction of environmental legislation mirrored the process in that there was initial resistance that was overcome by the threat of penalties but, most of all, by the threat to public goodwill.

The ISO series of quality standards – ISO 9000, 14000 and, yet to come, 16000 – have provided good building blocks, Martin said, but he questioned whether their continued development was valuable and suggested that they are kept alive by marketing.

In contrast to the regulations governing the transport of dangerous goods, standards and legislation on tank storage are generally local or regional in nature, Martin pointed out. This makes life hard for managers of multinational operations. In Europe, the main issues are:

(a) Seveso II, application of which varies across the EU, it being high on the agenda only in the UK, Germany and the Netherlands;

(b) the IPPC Directive, which has brought worries about cost;

(c) the ATEX Directive on equipment for use in explosive atmospheres, which is not a problem;

(d) national emissions ceilings (NECs), which differ even between neighbouring states;

(e) the International Ship and Port Facility Security (ISPS) Code, which is being implemented without problems; and

(f) the new Hazardous and Noxious Substances (HNS) Convention, about which again there is great concern.

Overall, Martin said, all these different requirements are applied with varying levels of commitment across Europe and with different timings. This appears to be anti-competitive. Furthermore, they result in a large number of different pieces of legislation in each state, which he said is "very, very burdensome".

Some clarity on the current situation as regards the HNS Convention was provided by **Gaetano Librando** of the International Maritime Organisation's (IMO) legal division, who began by admitting that the current situation is not very encouraging, with only eight states having so far ratified it. On the other hand, the EU has urged member states to sign up by June 2006, which would allow it to enter into force by the end of 2007.

In a panel discussion, **Hennie Standaar**, secretary-general of FETSA, said that the HNS Convention improves on its oil equivalent, the Oil Pollution Compensation Fund, by allowing physical receivers such as storage terminals to pass on the onus of contributing to the compensation fund to the cargo owners. It will work best as an international provision but, of course, the US will not be taking part.

"We have to face facts," Gaetano said. "The US will never sign up to liability conventions." On the other hand, he warned, the alternatives to HNS are worse – there would be a multiplicity of regional and national provisions. Richard Kellaway expressed concern about the likely bureaucracy that will be created, despite the lack of any significant number of serious incidents involving dangerous goods that would have triggered compensation from an HNS fund.

Looking after the tanks

The third day of the StocExpo conference was taken up with papers on technical operations, encompassing inspection, maintenance and repair. **Lennart Hagg**, technical director at Saab Rosemount Tank Gauging, produced a paper on dealing with legacy equipment. He commented that efforts to standardise fieldbuses have had limited impact on tank gauging systems. These systems have a long life-span and changing them to open standardised buses does take time. He explained that most tank gauges use manufacture-specific fieldbuses, which means that they lack open interconnectivity, limiting upgrade options.

There are a number of choices for upgrading a tank gauging system, according to Lennart.

1. The old system can be maintained, but there may be problems accessing spare parts, a high maintenance burden or the technology could be worn out.

2. A new model could be bought from the same supplier, but there is always the chance the supplier might not exist anymore.

3. Mix equipment from different suppliers with another fieldbus, but this would mean changing the cabling and other parts.

4. The whole system could be completely changed, which requires a large budget and a lot of effort and down-time and could affect the control room equipment.

Lennart said that emulation offers a solution to this problem. The same fieldbus can be kept, but with new level gauges that imitate the old gauges. The control room will then not see much difference apart from better performance.

New gauges have to be electrically compatible with the existing fieldbus, the software has to be compatible with existing software, all measured data that the master requires must be available, the configuration of the emulating gauge must be possible and there should not be intellectual property on the tank bus, which is not really a problem with old tank gauges.

There are many companies now offering this form of emulation: Saab Rosemount Rex radar can emulate a Whessoe Whessmatic 550, the Enraf bi-phase mark (GPU), the L&J Tankway, the GSI 485 and the GPE current loop. Lennart explained that a lot of these suppliers have stuck with the same fieldbus, which has helped Saab to emulate the level gauge. The Saab Radar Rex emulation is achieved by plugging in a low-cost circuit board with the wanted fieldbus.

Larry Speaks, general manager of Mass Technology, gave an overview of precision leak detection systems and their application. Such systems are used primarily to satisfy the API 653 requirement for periodic assessment of tank bottom integrity. They can also be used to certify the tightness of new constructions, defer unnecessary internal inspections and reduce or eliminate the cleanup cost from undetected leaks.

Larry said the only way to find a leak in a big tank is through precision leak testing - leaks can be left undetected if inventory control, hydrostatic testing and conventional testing methods are used. Precision mass measurement is quantitative, verifiable and gives positive results. It works by using the mass of the column of fluid to detect any change in the contents of the tank. It is not affected by changes in the product temperature, which is helpful as ASTs are generally subject to extreme weather conditions.

The third day included a number of other papers of interest to technically minded readers, which will be reviewed in more detail in forthcoming issues of the **Bulletin**.