

Safe sailing

Maersk Tankers moves more of the world's refined oil products than any other carrier, and follows a strict operational and compliance regime to ensure it does this safely. Nick Kochan talks to Maersk managers to find out what financial institutions can learn from the shipping industry

Moving flammable and dangerous liquids and gases across the world's oceans is an inherently risky activity. It has been the cause of accidents such as those involving the *Exxon Valdez* in Alaska in 1989, the *Torrey Canyon* on the coast of Cornwall in 1967 and the *Amoco Cadiz* off Brittany in 1978. Such events – and related accidents involving oil spills from rigs and wells, such as BP's Macondo spill in the Gulf of Mexico last year – have been the catalyst for an extensive safety regime for the oil, gas and chemical tanker industry.

This regime affects every aspect of operations at one of the world's largest tanker operators, the Danish shipping line Maersk Tankers. Operational risk management for a tanker operator includes installing and enforcing safety procedures around crew and cargo, dealing with international regulations, and proper personnel management – all factors that apply just as strongly to financial institutions as to shipping companies.

Operational risk management starts with the recruitment of the crew and officers for each ship. It covers the state of the tankers, determined by frequent and detailed inspections of the vessels. It goes on to include careful management of the suitability of the cargoes and decisions on the routes taken by the ships. These inspections and controls are undertaken by the ships' owners, but also by the companies hiring the ships and by the ports where the ships unload their cargoes. The stakes for tanker operators are high – a failure, whether through lack of care or lack of understanding of risk, could mean environmental disaster, loss of life and damage to the reputation of the entire industry.

Maersk Tankers owns or manages a fleet of 287 tankers and employs 2,865 people at sea and another 401 on land. Its tankers have the largest share of the market in moving refined oil products, and it also owns 14 crude oil carriers – the largest of which, the *Maersk Sara*, can haul 323,000 tonnes of oil. The parent company, AP Moller-Maersk, is a family-controlled conglomerate, owning a bank and retail assets as well as shipping and petrochemicals.

The greatest operational risk in owning and operating tankers, says Steffen Jacobsen, Maersk Tankers' Copenhagen-based chief technical officer, is the human factor. The sort of accidents that can occur range from the trivial to the devastating. "You could have chief officers sleeping on duty while they are navigating the vessel, or people grossly disregarding instructions or procedures. One of the most common human errors is that you do things again and again, and you get sloppy. [You tell yourself] 'last time I did this and skipped a step and it was fine, so let's do that again'. These are shortcuts. We also see that with incidents of people getting injured on board. It is typically slips, trips and falls. People rushing down a staircase and twisting their ankle, or rushing with a repair job just before lunch instead of taking lunch and then finishing the job. Of course, we always try to implement more control measures. We require people to do a risk assessment before they do a job. If we change things radically we go through a change management process."

Jacobsen says companies that hire tankers check the careers of every officer serving on board to assess the extent of their experience and competence. "If you want to own and run an oil tanker, you have to have



competent officers with in-rank experience, in-vessel experience and preferably in-company experience." The company puts recruits through two sets of tests. One checks competence and intelligence. The other checks personality. Jacobsen says: "There are certain people we don't recruit and there is a minimum level for intelligence." Drive and energy are undesirable – in fact, positively dangerous – unless they are accompanied by caution and attention to detail. "Can you imagine having a navigator who is like that? What is the likelihood of him remembering to fill out the checklist or updating his charts? His only focus will be: I am going to get there, I am going to be faster than everyone else. We want people who are really focused on detail and conscientious. Shipping is a dangerous business."

The key duties of the sailors and officers on board a ship are to navigate it correctly; to ensure its cargo is safely loaded, monitored during sea passage and discharged; and to maintain the vessel in a way that meets the requirements of the various regulatory bodies.



Navigation is a particularly sensitive issue, as the industry is undergoing a change from paper-based navigation and charting to electronic mapping systems. Companies are required by the industry regulators to have completed this process by 2015. At the moment, the industry is using dual processes, and there is concern this split might introduce uncertainty into navigation decisions, many of which are taken by people under great time pressure.

According to Siddharth Misra, Maersk's regional marine operations manager: "The industry is in a transition phase where we are going from very reliable updated paper charts to electronic charts. And as always when you have transitions, there are risks. All ships today have electronic charts as well as paper charts."

This is causing concern: ships' officers are increasingly using computerised maps that are updated electronically, although many might not be able to interpret them correctly and some have received no formal training on the electronic system. Interpreting paper maps that are updated monthly is more

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straightforward, and sailors have had long experience. Paper charts are still the main means of navigation on most of the vessels in Maersk's fleet, with electronic charts provided as an aid to the navigator.

However, the electronic systems are temptingly easier to use. "Unless we are very stringent, people navigate on the electronic charts and not on the paper charts," notes Misra. But in the hands of navigators who are not trained or experienced in their use, the electronic charts might be less reliable, he

warns. "Over the past couple of years some conspicuous groundings have been caused by people navigating with electronic sea charts and not being 100% correct – the user limits and alarm settings were incorrectly set for the sea passage and vessel size. This is due to lack of understanding and familiarity with the equipment in use on board."

Maersk's approach is to enforce the use of paper charts in the short term while pushing every navigation officer to train on the electronic system. "We try to protect against accidents with a lot of internal audits every week, to try to verify that people are navigating with paper charts – and we have started people on specific equipment training. This is a big change in the way we will be navigating vessels in the near future – we have initiated a change-management process to ensure all our navigators are trained, skilled and fully conversant with the use and limitations of Ecdis [electronic charts] as the primary means of navigation. So we are trying to manage the risk, but it is definitely there." An amendment to International Maritime Organisation standards will

enforce Ecdis training for all navigators sailing with Ecdis-equipped ships, to prevent the risk of their relying on equipment that they do not fully understand.

The switch to electronic maps is prompting the industry to require greater levels of technical and electronic expertise among its officer class. Jacobsen says the high levels of expertise required, together with a recent growth in shipbuilding, has led to demand for officers outstripping supply. “The tanker industry is short of 10,000 officers right now,” he comments, adding that salaries are rising even though the tanker industry is under pressure from the wider global slowdown.

Tanker crews are particularly difficult to recruit: they tend to spend long periods at sea, and work in a particularly dangerous environment, not only because of the risk of explosion and fire, but also due to the growing threat of piracy – tankers are a prime target as the value of their cargo means owners are willing to pay high ransoms for their return.

The danger doesn't end when the crew successfully navigates the tanker into port – loading and carrying cargo involves the risk of contamination, fire or explosion, which is controlled by detailed cleaning and fuel management regimes, and assessing compatibility between cargoes carried on board.

Misra highlights the risk posed if the materials making up or lining a tank react with the cargo it carries. “When a charterer or commercial manager sends us a request, we have to make sure the particular vessel can load that particular cargo,” he says. “We check with the coating manufacturers if it is OK. We check if the vessel has any special requirements for the carriage of the nominated cargo. We check what the last cargo was. We find out if she needs any special solvents to clean the tanks. We try to find out if the vessel can safely carry the cargoes she is supposed to. The charterers initiate a dialogue with us and the vessel's master. This will ensure both ends check thoroughly if the vessel is able to carry the nominated cargo onboard. This also ensures the vessel has the required documentation on board to carry the cargo grade nominated. After those checks we can get back to the charterer and say ‘it is good to go’ or ‘it is a no-go.’”

The cleaning process itself has its hazards unless properly managed, says Misra. “You could have explosions, or serious injuries or fatalities on board. Cargo tank cleaning has led to a lot of incidents and



accidents. When you clean the tank you might have to make it ready to enter. The atmosphere needs to be checked – sometimes, especially in the past, the standards were not as high as they are now, and people actually lost their lives where there were pockets of carbon monoxide and other toxic gases.”

Cleaning plans go to the marine superintendent ashore for review before the cargo is loaded: in addition, ships' captains need to check the cargo won't react with the material of the tanks themselves. “High-specification chemicals have high standards, and you need to be sure your tanks are completely clean. Certain cargoes need a wall wash test, for instance. You might need to clean your cargo tanks for a few days to be able to change to higher grades of cargoes.”

Independent cargo surveyors also check the tank before loading can go ahead, and again after a foot's (30cm) depth of cargo has been loaded. Failing the tests means the ship will have to leave port and re-clean the tanks at sea. “All that costs a lot of money to the owners and the charterers. We make sure the

safety and the quality is maintained for cleaning.”

Like financial institutions, tanker operators have to deal with international and national regulatory standards.

Many agencies set the standards for maintaining the quality of the tanker fleet. Classification societies such as Lloyd's Register and Det Norske Veritas have been in business to rate individual ships for centuries, but – as with the major credit rating agencies in the financial sector – they are paid for by the ship owners. The Oil Companies International Marine Forum (OCIMF) is composed of all the major oil companies and oversees the Ship Inspection Report Programme (Sire).

Sire grew out of the oil business's need for reliable independent quality assurance, Jacobsen explains. “Customers in the oil business have said: we cannot trust classification societies; we cannot trust owners, because owners always take short cuts; we cannot trust flag states; and we don't trust port state controllers either. So they have basically developed their own criteria, building on all the existing legislation. They



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look at the Convention for the Safety of Life at Sea, the International Safety Management Code, and the International Ship and Port Facility Security Code. They have taken all this and have turned it into a checklist. They audit all the major owners they deal with every two years.”

The Sire examination, which is based on similar systems used by aircraft maintenance companies, is extremely detailed. There are up to 650 questions in the questionnaire, and the inspection can last close

to nine hours, Jacobsen says.

These reports are critical to both shipowners and charterers. Ships are inspected three times a year under Sire, and the Sire reports are made available online to any OCIMF member – typically, oil companies draw on Sire reports and port inspection results when deciding which tanker to use. Misra adds: “If during the screening process the oil companies require any further information for a vessel under our technical management, they ask us for it. So it gives them a complete picture of how the vessel is performing.”

Oil recipients draw on Sire reports too, he adds. “All our customers are checking us all the time. If you look at the risk across the shipping industry, I will bet you tankers are doing a lot better than everyone else. This is because our customers have this continuous focus,” he says.

As well as the state of the ship, the OCIMF reporting process also looks at the officers on board, and OCIMF holds and provides detailed information here too. Misra says charterers pay considerable attention to the levels of experience aboard a tanker. “Not only are they looking at the latest inspection, the latest audit of the owner, the last port state control inspections, the class records, but they are also saying they need to see how long the crew has been employed by the company,” he says. “They always look at the time a master and chief officer have been together, or the time the chief engineer and the second engineer have been together.”

As with ship inspection reports, tanker owners upload crew details to OCIMF, and the crew matrix – the service records of all the officers of a particular ship – is also available to download. “That way they can say: OK, the combined in-company experience between the master and the chief engineer is 1.6 years plus 3.1 years, so that combined is 4.7 years. The last thing they look at is experience in rank. For instance, if you have a newly promoted captain, then he might have 10 years with the company, five years’ vessel time, but he has 0.1 year as captain, so whoever you combine him with has to have three years’ in-rank experience,” Misra says.

Tanker companies also need to be aware that each potential customer has its own risk assessment method and risk appetite. “They set their own criteria,” says Misra. “But they will have a risk management tool, and they will say: ‘If you don’t fulfil this we will find

someone else.’ So it is more than just ship management. You have to be compliant at all times.”

OCIMF and the classification societies are not the only bodies inspecting Maersk’s fleet. Just as banks must deal with national regulators in every country in which they operate, tankers must pass inspection by every state they visit.

National authorities will examine a tanker when it docks and carry out a port state control inspection, to ensure they are happy with its capability to handle or offload the cargo. They might also scrutinise a captain’s credentials, officers’ certification to sail on the vessel, and the preparedness of the vessel to react in the event of an emergency. The port state inspection results give a tanker a rating, which is used to determine the frequency at which the vessel is inspected. In some cases, port officials have held ships to ransom by demanding bribes in exchange for a favourable inspection rating; Maersk says it has a strict policy of refusing to pay bribes.

While external reports affect the commercial viability of a vessel, tanker companies have many internal controls to ensure safety and efficiency. Sanne Berglund Simonsen, Maersk’s health and safety co-ordinator, outlines the procedure at Maersk: “We draw up a sustainable action plan at the beginning of each year that covers health and safety targets such as lost-time incidents and accidents. We monitor these on a monthly basis and we have a scorecard prepared for the vessels and for the shore departments. There we monitor performance on various key performance indicators. All that is put together and the vessels are also monitored for security, safety and technical performance, which is also monitored monthly.”

The level of inspection from port authorities, oil companies and OCIMF means tanker companies are under great pressure to ensure tight quality management – failing to respond to a criticism will be extremely damaging, Jacobsen says, and good internal controls are essential to avoid failing inspections. “The last thing any ship owner wants is to have a customer find out you are a poor ship manager. So of course your own quality management has to be very sharp. Our internal inspections, twice a year, are very sharp. Our controls over how long our tankers close out corrective actions are vital. If we are not sharp in our monitoring, this will be picked up by customers when they screen our vessels and we might lose business.” ■