Reporting back from conferences, seminars and discussions across the maritime world. Join the discussion at LinkedIn, or email **editor@nautinst.org**

SMM REPORT

➔ One of the largest maritime trade shows in the world, SMM is known for its focus on technology and technical development. In addition to the vast exhibition space, a number of seminars and presentations offer insights on developments within the industry.

Liquefaction

Mr Noboru Ueda, Chairman and President of ClassNK, described how the organisation is leading an international consortium involving experts in Japan, Germany and France to assess what causes bulk cargo liquefaction, and how it can best be countered.

'Bulk carrier safety is of incredible importance to ClassNK as the biggest entry in the register comprises those types of vessels,' declared Mr Ueda. 'As BIMCO said, nickel ore is the world's "most dangerous cargo" and we want to prevent capsizing.'

One of those participating in the project is Mr Marco Schneider of the Hamburgische Schiffbau-Versuchsanstalt GmbH ship model basin. He said that liquefaction can happen so quickly that crews had no time to abandon ship. So far, project participants are aware of 10 ships lost to this problem between 2007-2011.

He said three elements can cause liquefaction:

- Cargo properties – especially the moisture content;
- Ship design;
- Sea conditions.

All three elements must be present to lead to capsizing.

Class NK's design project is taking steps to investigate the issue, including looking at ship dynamics and conducting lab experiments. Initial investigations centre on a vessel simulation project aiming to produce practical advice for counter-measures on existing vessels and guidelines for ship design. 'We also hope to suggest ways to help to improve cargo testing onboard,' Schneider added. Although the project is at an early stage, it is already obvious that the size of the vessel influences the outcome of cargo liquefaction. 'There have been problems in Asia trades with Panamax vessels, but the bigger ships from South America seem to cope better. The cargo still liquefies but it appears the larger vessels are more stable,' Schneider said.

Another participant in the project is Oldendorff Carriers GmbH & Co KG. Captain Herman Visser, Senior Port Project Manager for the company, criticised shippers for misdeclaring the moisture content of shipments and for putting pressure on crews and ship operators to accept cargoes. He said the existing IMO code needs even further updating, and appealed for scientific findings to be taken into account when legislation is considered. The updated schedule for iron ore fines and the modified test for them should lead the way for attention to be given to other cargoes that might liquefy. His concern included the testing methods – if the material consists of very small particles the testing methods might be 'flawed'.

Declaration of moisture content is not mandatory, although Masters would like it to be so. Even this may not solve the problem, as although the IMO issues legislation it depends on member states to implement and enforce it. He described progress in this area as 'unfortunately slow' and said that testing should be verified by independent authorities.

In Oldendorff's experience, some types of nickel ore might be less likely to liquefy than others. 'Indonesian nickel ore is different from that from the Americas,' Visser explained. The risk also differs according to the size of the stockpile, the shape of particles and how the cargo was loaded. 'We send a Master Mariner or surveyor from our own team to go and vet the terminals,' he explained. 'There are some ports we will not touch, yet others can show control from the mine to the terminal.'

Oldendorff has devised new routines for Masters, urging them to continuously monitor cargoes, take physical soundings and look in the hold. 'We have stopped taking cargoes from danger areas and insist Masters watch loading,' added Visser. 'Cargoes from some regions are unacceptable to start with from a commercial standpoint. The moisture levels are too high – nickel ore may be only 1% of a cargo and very poor quality.'

He highlighted the practical difficulties of rejecting a cargo once loading had started. 'The problem with loading ports is that usually there are no cargo discharging facilities so the ship will likely have to make a short voyage anyway.

Despite the difficulties in implementing its findings, the research has the potential to make a huge difference. 'If we can stop anything going to sea which should not go to sea then we can save the 20 lives onboard that vessel,' Visser said. He described the case of a vessel which had problems with a liquefied dry bulk cargo off the Philippines. There was a successful outcome because the vessel managed to stop and prevent further motion making the list worse. Captain Visser said: 'If the vessel's motion stops then it's possible that the cargo will stabilise but to be successful the operation will need the emergency services standing by.'

Bulk carrier design

A seminar organised by class society DNVGL heard how bulk carrier design is being improved to produce more eco-friendly vessels that are 'future-proofed' against future changes in regulation. Recent developments have included increasing the minimum thickness of hull structures, while measures to reduce noise levels would be accommodated.

Bulk carrier design was a major focus of one of the seminars at SMM