The dangers of liquefaction

What is the law, and why do incidents continue to occur?
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On 31 March 2017, the 322 metre long, 266,141 dwt VLOC bulk carrier Stellar Daisy sank in the South Atlantic Ocean en route to China. Many in the shipping industry have been asking why the vessel reportedly split and sank after taking on water following a hull crack 2,000 miles off Uruguay. The investigation is expected to take a long time and is likely to be inconclusive, but some insurance officials have pointed out that the speed of sinking and high loss of life mirrored casualties related to liquefaction of cargoes such as iron ore and nickel ore.

This booklet of extracts combines articles from Shipping and Trade Law and Maritime Risk International, as well as other sources on i-law.com, to provide some background to liquefaction, summarise what the law is, and explore why incidents continue to occur.

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Liquefaction: shipping industry response

The dangers associated with the carriage of solid bulk cargoes are undoubtedly one of the decade’s hot issues in the shipping industry, writes Moustafa Fkhir.

No P&I Club has failed to warn their members about the dangers of loading unsafe solid bulk cargoes, and some have even gone so far as to put their policies’ cover on hold if such cargoes are loaded without consultation. This article considers how the shipping industry has responded to the issue of solid bulk liquefaction to date, and whether there remains room for further improvements.

The IMO introduced the mandatory International Maritime Solid Bulk Cargoes (IMSBC) Code in January 2011. It provides information about the dangers associated with the shipment of solid bulk cargoes and procedures to be adopted by the relevant parties in order to facilitate the safe carriage of such goods. For example, the Code outlines the obligations on shippers to provide all the necessary documents, including test certificates, to the master prior to shipment. It also sets out loading and carriage precautions to be followed by the master when handling and stowing the cargo.

Shipping & Trade Law, in its October 2016 issue, touched upon certain flaws found in the IMSBC Code, such as mis-categorisation of cargoes, questionable test procedures giving unreliable results and, importantly, lack of an effective enforcement plan leaving the interpretation of its provisions open to diverse national laws. Therefore, subject to further improvements and research, the Code alone does not provide reassurance that the liquefaction nightmare will soon be over. Undoubtedly, the insurers are the most significant players in tackling the said issue as they have contributed immensely to raise the industry’s awareness of the potential damage from liquefaction incidents.

Unfortunately, many port authorities, mainly in the countries of shipment, are adding insult to injury by, as reported in some cases, exercising pressure upon the parties to load as quickly as possible to evacuate the berth. Such practice gives the master no time to verify the safety of the cargo nor to follow the necessary precautions in trimming the cargo or loading it properly in accordance with the Code. In addition, port authorities are, in principle, obliged to verify the safety of the cargo and be the IMO’s watchdog to ensure effective enforcement of its conventions. But sadly, this cannot always be the case, jeopardising safety in the global shipping trade.

Having analysed how the concerned parties have responded to the liquefaction issue, one must assess the strength, weakness and overall effectiveness of the actions taken. Marine liability insurers are playing a major part in stopping liquefaction incidents, and their contribution is noted. The IMO is biennially amending the IMSBC Code to meet its ultimate goal of preventing further losses, and research is consistently underway to better understand the properties of solid bulk cargoes.

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This is an extract of the original article. To access the full analysis, please visit Shipping & Trade Law, February 2017 issue, on i-law.com.
Liquefaction of iron ore fines

Unscrupulous shippers have been known to misclassify liquefying iron ore fines as non-liquefying ore concentrates, to evade the stringent regulation of liquefiers under the International Maritime Solid Bulk Cargoes (IMSBC) Code, writes Amar Vasani.

These practices are possible due to the absence of definitive industry tests for demarcating liquefiable cargoes from those which do not pose such a risk.

Soon to be in its sixth iteration, the IMSBC Code is the foremost international legal device for ensuring that solid bulk cargoes are shipped safely. The role of the IMSBC, according to its foreword, is in “providing information on the dangers associated with the shipment of certain types of solid bulk cargoes and instructions on the procedures to be adopted when the shipment of solid bulk cargoes is contemplated”. The initially voluntary Code has since been made mandatory under the International Convention for the Safety of Life at Sea 1974 (SOLAS).

In the past, deceitful shippers have misclassified iron ore fines as “non-liquefiers”, bypassing more stringent testing regulations applicable to cargoes particularly likely to liquefy. Whilst treatment of this substance, according to the Code, requires that “it should be kept dry at all times, the holds should be inerted and temperature and gas monitoring should be carried out”, misclassification can mean that this does not happen, with the fines kept outside at the mercy of the elements. One unfortunate consequence of such treatment was the sinking of both Black Rose and Asian Forest in India in 2009. The two vessels, full of iron ore fines, overturned following increasingly uncontrollable lists. Subsequent investigations found that a build-up of moisture led to liquefaction of the iron.

New warning on cargo liquefaction

The Association of Bulk Terminal Operators (ABTO) has warned that cargo liquefaction – an issue commonly associated with the seaborne transportation of unprocessed mineral ores and concentrates – is also an issue which bulk terminals need to pay attention to. Speaking at the ICHCA ISP 76 panel meeting in London recently, ABTO chief executive Ian Adams said: “The liquefaction of bulk commodities is a serious issue which can and should be managed effectively shoreside. However, allowing ship’s crews access to stockpiles to assess solid bulk commodities such as Bauxite and nickel ore is not the answer in view of the fact that stockpiles have been known to collapse. Tests should only be carried out when the cargo has been moved for loading onto the vessel.”

At the 3rd session of International Maritime Organization’s (IMO) Sub-Committee on Carriage of Cargoes and Containers, it was agreed to draft new amendments classifying coal as a Group A&B cargo and to push through amendments specifying that the “shipper shall be responsible for ensuring that a test to determine the TML (transportable moisture limit) ... and that the shipper shall be responsible for ensuring the sampling and testing for moisture content”. Referring to the ongoing amendments to the International Maritime Solid Bulk Cargoes (IMSBC) Code, Adams said: “There has been a significant amount of time at IMO debating the IMSBC Code and exploring the use of a modified Proctor/Fagerburg test for coal as a viable way of detecting and preventing cargo liquefaction. Australia, Brazil and China have done a tremendous amount of research into the test methodology and we are now nearing the point of conclusion.”

While the IMSBC Code applies primarily to the seaborne carriage of cargoes, Adams said there is a “definite crossover”, but bulk terminal operators are often left behind during the regulatory decision-making process which, given that five billion tonnes of bulk commodities are transported annually, needs to change.

This article was first published in Maritime Risk International, November 2016 issue.
On solid bulk liquefication

Solid bulk cargoes, such as nickel ore and iron ore, have a tendency to liquefy. Such goods can transform from hard to liquid state very rapidly leaving no time for the master or crew to do anything but face their imminent fate, writes Moustafa Fkhir.

The liquefaction of solid bulk cargoes has claimed many seafarers’ lives and dozens of ships. The moisture content present in these cargoes can be dramatically increased to unsafe limits by the mere reason of the vessel’s rolling on waves. In response to the alarming number of liquefaction casualties – 13 incidents within seven years, with a death toll exceeding 100 – the IMO introduced the now mandatorily applicable International Maritime Solid Bulk Cargoes (IMSBC) Code.

The aim of the Code is to provide information on the dangers associated with the shipment of solid bulk cargoes and procedures to be adopted by the relevant parties in order to facilitate the safe carriage of such goods. It sets out the obligations of shippers to provide all the necessary documents to the master prior to shipment, and loading and carriage precautions to be followed by the master when handling and stowing the cargo.

In addition, the Code includes test procedures to determine the moisture content of the cargoes to be followed by laboratories and surveyors, and it also provides a wide list of individual schedules for various solid bulk cargoes that detail specific precautions to be followed in the carriage of such goods. Therefore, strict adherence to the IMSBC Code is required in order to harmonise best practices for the safe carriage of such goods. However, the Code has not brought an end to the occurrence of liquefaction incidents. Five serious liquefaction casualties have been reported since it was made mandatory in 2011.

The IMSBC Code is a new measure but not a magic wand to stop liquefaction. Its effectiveness has rightly been questioned, pointing to certain flaws found in the Code, but being a living document, subject to amendments biennially, it will continue to advance standards in response to emerging issues. Also, test methods need to be developed in order to accurately deliver precise and reliable results for the moisture content present in the cargo. This will enhance the parties’ confidence that the results are truly representative of the cargo and may contribute immensely to the safe shipment of solid bulk goods.

The IMSBC Code has undoubtedly raised awareness about the issue of solid bulk liquefaction, but its provisions and test procedures need to be developed in order to determine the precise breaking point for such goods to change from hard to fluid state. All those involved in the shipping of solid bulk cargoes must be made fully aware of the risks involved.

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This is an extract of the original article. To access the full analysis, please visit Shipping & Trade Law, October 2016 issue, on i-law.com.
International Maritime Solid Bulk Cargoes (IMSBC) Code

Commercial Shipping Handbook

The primary aim of the International Maritime Solid Bulk Cargoes (IMSBC) Code, which replaces the Code of Safe Practice for Solid Bulk Cargoes (BC Code), is to facilitate the safe stowage and shipment of solid bulk cargoes by providing information on the dangers associated with the shipment of certain types of solid bulk cargoes and instructions on the procedures to be adopted when the shipment of solid bulk cargoes is contemplated. The IMSBC Code may be applied from 1 January 2012 on a voluntary basis, anticipating its envisaged entry into force on 1 January 2013, from which date it will be mandatory under the provisions of the SOLAS Convention.

International Maritime Solid Bulk Cargoes Code

Dictionary of Shipping Terms

International Maritime Solid Bulk Cargoes Code, produced by the International Maritime Organization (IMO), is intended to facilitate the safe stowage and shipment of solid bulk cargoes by providing information on the dangers associated with the shipment of certain types of cargo and instructions on the appropriate procedures to be adopted. Abbreviated to IMSBC Code. It replaces the international Code of Safe Practice for Solid Bulk Cargoes (BC Code).

International Convention for the Safety of Life at Sea (SOLAS) 1974, As Amended

The Ratification of Maritime Conventions

The International Convention for the Safety of Life at Sea (SOLAS) was adopted on 1 November 1974. Since then, two Protocols and many amendments have also been adopted. This is due to the pressing need that safety and construction matters be dealt with as soon as technological changes in the construction of ships require.

How can the new Bimco cargo clause help?

Maritime Risk International

On July 25, 2012, Bimco published its “Solid Bulk Cargoes that Can Liquefy Clause for Charter Parties”. The clause has been issued to help ensure the safe transportation of solid bulk cargos, which is a particular issue in the case of cargos prone to liquefaction or combustion. The clause clearly sets out the rights and obligations of the parties and should help avoid arguments between the parties. In some parts, the clause merely states the obligations of the parties at law and in other parts it goes further and allocates risk and expense when there are issues with the water content of a cargo.
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