

# Bauxite cargo liquefaction risk revisited



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### Conditions that may take bauxite outside Appendix 1 specification:

- Heavy rainfall, particularly during monsoon season, coupled with open storage conditions which prevent the cargo from drying sufficiently before it is loaded.
- The practice of using water cannons to wash bauxite fines and lumps through sieves which can increase the moisture content of the cargo by as much as 15%.
- The pre-filtering of cargo to take out particles and lumps above 100 mm in size and further crushing of particles which may be an issue if the moisture content is high.

For further information on liquefaction, the **Standard Cargo: Liquefaction Special Edition** is free to download.

On 1 January 2015, the bulk carrier *Bulk Jupiter* sank, resulting in the tragic loss of 18 of its 19 crew. Although the cause of the incident is unconfirmed, the vessel was carrying a cargo of bauxite loaded at Kuantan, Malaysia, leading to increased discussion of the dangers of liquefaction associated with the carriage of bauxite.

Mineral ore cargoes loaded with a high proportion of fine particles and moisture content in excess of their transportable moisture limit (TML) are prone to liquefy. This can result in cargo shifting during a voyage, with the loss of ship stability. Liquefaction has caused a number of serious casualties in recent years.

### Cargo classification

Bauxite is a cargo typically consisting of lumps with relatively low moisture content and so is commonly classified as a group C cargo – cargo not liable to liquefy, as per the International Maritime Solid Bulk Cargoes (IMSBC) Code.

Appendix 1 of the IMSBC Code describes bauxite as a cargo with:

- moisture content of between 0% and 10%;
- 70%-90% lumps varying in size between 2.5 and 500 mm; and
- 10%-30% powder.

If any of the properties listed in Appendix 1 of the IMSBC Code are not met, the requirements of section 1.3 of the Code, Cargoes not listed in this Code, should be followed.

### Factors affecting classification

Members should be aware of the conditions that may take bauxite outside the Appendix 1 specification, changing the properties of the cargo

from a group C cargo to a group A cargo, i.e. cargo that may liquefy.

Whilst these conditions have been widely reported as affecting bauxite cargoes shipped from Malaysia, Indonesia and Brazil, they could also occur in other geographic areas and members should remain vigilant.

As Appendix 3 paragraph 2.1 of the IMSBC Code states: "Many fine-particled cargoes, if possessing sufficiently high moisture content, are liable to flow. Thus any damp or wet cargo containing a proportion of fine particles should be tested for flow characteristics prior to loading."

### Preventative measures

The club recommends that members always check the shipper's cargo declaration and moisture content certificate carefully, especially noting:

- the description of the cargo;
- how it is treated under the IMSBC Code; and
- the stated moisture content.

If members have any concerns over the validity of the details provided, they should contact the club for advice and assistance. If necessary, attendance of an independent surveyor should be arranged to determine the actual condition of the cargo and its suitability for carriage before the cargo is loaded on board the ship.