Liquefaction : an update

Intercargo Executive Committee meeting

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Overview

- IMSBC Code amendments 02-13, 03-15
- Update on dry bulk cargo types
- IG & Intercargo contact with Clubs, IMO
- Other potential problem cargoes
- Solutions to liquefaction
- What does the future hold?

IMSBC Code amendments 02-13

In force 1st Jan 2015.

Competent Authority (CA)

- To operate independently from the Shipper. (Section 1.7)
- Signed cert of TML & MC must be issued by an entity recognized by the CA of the port of loading. (4.3.2)

IMSBC Code amendments 02-13

Sampling, testing and MC control

- If cargo may liquefy, procedures to ensure MC is below TML while onboard vessel, to be approved & implementation checked by CA. Copy of approval document issued by CA to be provided to Master. (4.3.3)

IMSBC Code amendments 02-13

Uncovered barges

- When transporting cargoes which may liquefy, Shippers shall include procedures to protect cargo on barges from any precipitation and water ingress. (4.3.4)

IMSBC Code amendments 02-13

Access for sampling of cargo

- For a cargo which may liquefy, the Shipper shall facilitate access to stockpiles for the purpose of inspection, sampling and subsequent testing by the ships nominated representative. (4.4.3)

IMSBC Code amendments 02-13

Access to full depth of stockpile

- For unprocessed mineral ores the sampling of stationary stockpiles shall be carried out only when access to the full depth of the stockpile is available and samples from the full depth of the stockpile can be extracted (4.4.8)

IMSBC Code amendments 02-13

Cargo which may liquefy. Conditions for hazards

- Liquefaction does not occur when the cargo consists of large particles or lumps and water passes through the spaces between the particles and there is no increase in the water pressure.(7.2.2)

IMSBC Code amendments 02-13

Test procedures for cargoes that may liquefy. Complimentary procedure.

- If samples remain dry following a can test, the moisture content of the material may still exceed the Transportable Moisture Limit (TML) (8.4.2)

IMSBC Code amendments 02-13

Materials possessing chemical hazards. (MHB)

- Updated definition and details of chemical hazards for an MHB.(9.2.3)

Amended and new schedules

- ‘Nickel Ore’ classed as Group A cargo
- ‘Sand, heavy mineral’ Group A cargo

IMSBC Code amendments 03-15

Enter into force 1st Jan 2017. Voluntary earlier adoption encouraged

- Voluntarily adopted already by Brazil, Australia and Marshall Islands.

IMSBC Code amendments 03-15

1. Draft new schedule for Iron Ore Fines
2. Draft revised schedule for Iron Ore
3. New test procedure for determining TML of Iron Ore Fines (using modified Proctor / Fagerberg test equipment)

- (Iron Concentrate is listed under schedule for Mineral Concentrates)

Update on dry bulk cargo types

Iron Ore

- China, major importer, set to continue
- Australia and Brazil major exporters. Vale now delivering ore to China in VLOCs. India not exporting due high prices.
- West Africa region fast growing exporters : Sierra Leone, Liberia, Guinea

Roxburgh appointed CA for Sierra Leone. Mining 'Direct Shipped Ore' for China

Wet season strategy : moisture reduction, covered stockpile, polymer additive

0.5kg to 1.0kg polymer per Mt cargo added to loading conveyor after stockpile

Update on dry bulk cargo types

Iron Ore

- Ukraine. Iron ore fines from Yuzhny. Concerns over lack of equipment and correct procedures at labs, as well as criminal and paramilitary elements which do not co-operate with outside 'western' interests seeking to assist.

- Philippines. Proposal made to IMO by the Philippines for a new schedule for Sintered Iron Ore. Currently 'Sinter feed' under Metal Concentrates, Group A. Draft new schedule proposes classification as Group C cargo. Tests carried out but more information needed.

  Cargo needs to be treated as Group A for time being

Update on dry bulk cargo types

Nickel Ore

- Indonesia. Export ban still in force. But will govt back track? Cargo being mined, stockpiled. Will procedures improve? Will Shippers and CA adopt the new Code amendments?
- New Caledonia. Research by French into how best to manage Nickel Ore production. Plan to present new Code schedule to IMO, or possibly first to Port State to ratify sooner.

Update on dry bulk cargo types

Nickel Ore

- **Philippines**

  Exports increased to meet demand from China (and lack of Indonesian ore)

  Problems still exist : not enough competent surveyors, no independent labs

  Conditions therefore not conducive to mandatory pre-load surveys

  Surigao area has busiest load ports, violence, political turmoil, intimidation

  Monsoon season no longer constant period. Stockpiles wet and uncovered

  Politicians proposed Bills to ban exports. But mine interests very powerful

  Uncertain if Bills will be passed soon. Exports continue now, largely unchecked

Nickel ore load ports in the Philippines

Update on dry bulk cargo types

Bauxite

- **Malaysia**

  'BULK JUPITER' sank off Vietnam on 2nd Jan 2015 carrying bauxite, 1 survivor

  Cargo loaded at Kuantan, Malaysia. Declared as a Group C cargo

  Heavy rains and flooding had taken place in Malaysia. Stockpiles in open area

  Sank quickly, liquefaction suspected. Investigation by Bahamas Flag ongoing

  Situation at Kuantan : Port Authority not allowing access to stockpiles.

  Other vessels that have loaded at Kuantan – bauxite found to be fluid at disport

  Mandatory notification requirement : extend to include Bauxite from Malaysia?

Update on dry bulk cargo types

Bauxite

Section 2.1 IMSBC Code : 'Many fine-particled cargoes, if possessing a 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.'

Concerns first raised in 2013 for Bauxite from Amazon and Indonesia.

Update on dry bulk cargo types

Bauxite

- Bauxite is classed as a group C cargo in IMSBC Code. To be so, it must have properties as follows :

‘Moisture content between 0% to 10%. Size 70% to 90% lumps, varying between 2.5mm and 500mm and 10% to 30% powder’

If properties outside above, or period of rains has been experienced, then cargo should be treated as a potential Group A cargo.

Update on dry bulk cargo types

Bauxite

- **Australia : Rio Tinto research into re-classification of Bauxite. IG have been in contact with Rio Tinto and will also contact AMSA.**

Update on dry bulk cargo types

Bauxite

- IG and Intercargo in contact with Malaysian representative to IMO, regarding future meetings with Marine Department to discuss establishment & role of a Competent Authority and also conduct a site visit to Kuantan, with a consulting scientist from MTD & local P & I correspondents, to meet Shippers and port officials.

IG & Intercargo contact with Clubs

- The American Club, along with other P & I Clubs in the IG have issued many Circulars, Alerts etc to their Members, regarding the dangers of liquefaction.
- The IG hold regular meetings with the Clubs to discuss the latest issues ship operators are facing and steps to be taken to assist them and the Clubs, and how matters can be taken up with the IMO. Next urgent topic to discuss with IMO : new classification of IMSBC Code schedule for bauxite.
- Intercargo work closely with the IG and the P & I Clubs. Intercargo have been involved in producing guides on the loading and carriage of nickel ore and other bulk cargoes.

IG & Intercargo contact with IMO

IG letter to General Secretary of IMO, on behalf of IG and Intercargo, states following regarding liquefaction :

- **There are a number of States that are exporting significant quantities of solid bulk cargoes, that do not have a declared Competent Authority, such as Malaysia and Indonesia.**
- **The lack of a Competent Authority in certain exporting States is clearly related to the tragic loss of life of seafarers from vessels sinking as a possible result of cargo liquefaction.**
- **There is a clear need for the IMO to have a more systematic approach in order to assist such States by providing technical co-operation.**

Other potential problem cargoes

River sand

- Dredged from beaches, usually described as Sand and shipped as a Group C cargo. However, the schedule for Sand states :

  ‘Description. Usually fine particles. Abrasive and dusty.’

- None of the five types of Sand listed are similar to River Sand.
- Also 2013 Code has a schedule for ‘Sand, Heavy Mineral’ which is a Group A cargo.
- Particle size of River Sand can differ depending on region.
- Further research and possible re-classification is required.

Other potential problem cargoes

Manganese

- Classified as a Group C cargo.
- However, proposal made to IMO to have a Manganese Ore Fines schedule classified as a Group A cargo.

Solutions to liquefaction

- ‘Amis Wisdom’ vessel. Cargo liquefied and vessel stayed at Batangas from Sept 2014 to Feb 2015 ‘dealing with the cargo’.
- Roxburgh Environmental : geotechnical research, behaviour of soils and other materials, construction earthquake research – now being applied to liquefaction problems. Able to propose solutions to deal with liquefied cargo. Combination of drying additives, drainage, moisture migration, pumping etc.
- NK Classed 27,200DWT ‘Jules Garnier II’ delivered 2012. First ‘Specially Constructed Cargo Ship’. Longitudinal bulkhead in holds. Built to carry nickel ore.
- Further research being undertaken into adapting existing ships into ‘Specially Constructed Cargo Ships’.

Specially Constructed Cargo Ship ‘Jules Garnier II’

What does the future hold

- Market forces and geo political issues influence the practices at load ports : India, Philippines, Indonesia, Malaysia.
- Lack of availability of experienced surveyors and qualified and properly equipped labs near to the load ports a continuing problem. Investment and growth will only follow if trade and conditions at ports are stable and safe.
- Will new Competent Authorities be established and function?
- Will further necessary changes to IMSBC Code for bauxite, be quickly adopted? What other cargoes need further research?
- Further research into behaviour of materials during seaborne carriage, and suitable testing methods to be adopted.

Thank you, any questions?