

SUB-COMMITTEE ON CARRIAGE OF
CARGOES AND CONTAINERS
2nd session
Agenda item 5

CCC 2/5/22
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AMENDMENTS TO THE IMSBC CODE AND SUPPLEMENTS

Correspondence Group on the evaluation of properties of Bauxite

Submitted by Australia, Brazil, China, Malaysia, the Marshall Islands and BIMCO

SUMMARY

Executive summary: This document proposes the establishment of a correspondence group to examine the risk of liquefaction of BAUXITE and/or to determine the need of additional tests in order to amend the existing individual schedule

Strategic direction: 5.2

High-level action: 5.2.3

Planned output: 5.2.3.3

Action to be taken: Paragraph 11

Related documents: CCC 2/5/21 and CCC 2/INF.20

Introduction

1 At approximately 0640 h local time on 2 January 2015, the Bahamas flagged bulk carrier **BULK JUPITER** developed a heavy list to starboard while sailing in strong winds and a moderate swell off the coast of Vietnam. This was followed by rapid capsizing with the loss of 18 of the 19-man crew. It has been suggested a possible causal factor in the casualty was loss of stability resulting from the liquefaction of the 46,400 tonnes of BAUXITE in bulk on board the ship.

2 While recognizing that knowledge of material properties related to the potential for liquefaction of bulk cargoes is improving, noting the work on IRON ORE FINES (IOF), the co-sponsors also recognize that considerable further research is required to arrive at appropriate and safe carriage requirements for some other cargoes with the potential for liquefaction when shipped.

3 Currently, BAUXITE is listed as a Group C cargo within the IMSBC Code. The industry in Australia and Brazil commenced research work related to the properties of BAUXITE in 2013, as a result of the outcome of research on IOF. This document provides an outline of the work done to date and the anticipated work that will be completed by early 2016 with a view to determine the risk of liquefaction.

4 The research to date has indicated that the majority of BAUXITE is a Group C cargo. However, the circumstances surrounding the loss of **BULK JUPITER** presented by the Bahamas indicates that it is necessary to consider the likelihood that BAUXITE with certain properties may present a liquefaction risk. As with iron ore fines, it is necessary that the effects of particle size distribution (PSD), mineralogy and moisture are understood so the risk of liquefaction can be ascertained and a mechanism for determining if the material is Group A cargo identified.

Research work to date and in the future

5 As noted in paragraph 3 above, the industry and competent authorities in Australia and Brazil have been examining the properties of BAUXITE. To date, over a dozen voyage observations have been carried out on cargoes loaded in Australia, which noted no slumping and limited compaction (about 1% of the original cargo volume).

6 Laboratory testing determined the Australian [and Brazilian] cargoes tested were free draining. In addition, noting that liquefaction is defined as the pore water pressure reaching 95% of the confining pressure, preliminary Cyclic Triaxial Testing (CTT) found this pore water pressure could not be achieved in the samples tested even at 100% saturation and with extreme vessel motions being simulated. Details of research to date are contained in document CCC 2/INF.20.

7 The work is ongoing, but if such findings were consistent across all cargoes then BAUXITE would be a Group C cargo. However, the information collected by the Bahamian Administration suggests that the cargo in **BULK JUPITER** moved in the manner a liquefied cargo would. In addition, information collected by the Bahamas with regards to contemporary BAUXITE cargoes loaded onto other vessels also suggest that some BAUXITE cargoes may have properties that present a liquefaction risk.

8 Australia and Brazil are continuing to work on materials research and laboratory testing and are looking towards consolidating research in an effort to determine the nature of the cargo properties across the spectrum. It is also anticipated that there will be independent verification of this work with a view to complete it for submission to CCC 3.

Proposal

9 Further research work must be completed before substantive conclusions can be drawn on the risk of liquefaction of BAUXITE carried in bulk. It is also desirable that this work be completed as quickly as practical and be made available for detailed assessment by the Sub-Committee. The co-sponsors propose that a correspondence group be established at this session to consider the research as it is completed and independently reviewed, and to report back to CCC 3.

- 10 The following draft terms of reference for the correspondence group are proposed:
- .1 Consider the evaluated and verified research into BAUXITE and its potential for liquefaction, which is to be submitted to the CG by the end of March 2016 – to be completed by the end of April 2016;
 - .2 Consider the marine safety investigation report on the loss of the bulk carrier MV **BULK JUPITER**, when published;
 - .3 Consider the adequacy of current methods for determining the transportable moisture limit (TML) for BAUXITE and develop as necessary new and/or amended existing methods to be included in appendix 2 of the IMSBC Code – to be completed by the end of April 2016;
 - .4 Prepare a draft individual schedule for BAUXITE – Group A and/or review the existing BAUXITE schedule as necessary; and
 - .5 Submit a report to CCC 3.

Action requested of the Sub-Committee

- 11 The Sub-Committee is invited to consider the information provided, in particular the proposals in paragraphs 9 and 10, and take action as appropriate.
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