



# Technical Circular

No.: 028/2024

Date: 9<sup>th</sup> December 2024

## **Subject: Liquefaction of Sand cargo and casualty**

1. SOLAS Regulation VI/1-2 requires that the carriage of solid bulk cargoes other than grain shall be in compliance with the relevant provisions of the IMSBC Code.
2. Typical cargoes currently shipped in bulk, together with advice on their properties and methods of handling, are given in the schedules for individual cargoes. However, these schedules are not exhaustive and the properties attributed to the cargoes are given only for guidance. Consequently, before loading, it is essential to obtain current valid information from the shipper on the physical and chemical properties of the cargoes presented for shipment. The shipper shall provide appropriate information about the cargo to be shipped.
3. If a solid cargo which is not listed in appendix 1 to this Code is proposed for carriage in bulk, the shipper shall, prior to loading, provide the competent authority of the port of loading with the characteristics and properties of the cargo. Based on the information received, the competent authority will assess the acceptability of the cargo for safe shipment.
4. Various sand cargoes, but not all, are listed in IMSBC Code as Group A (cargoes which may liquefy when shipped at moisture content greater than transportable moisture limit (TML)) and some in Group C (neither group A, nor group B (possess chemical hazard)). However, sand cargoes that are under group C are required to be kept dry before loading, during loading and during voyage.
5. Sand is being transported at Indian ports bearing various names, including “River Sand”. River Sand is not listed in Appendix 1 of the IMSBC code. However, it has been reported that the River Sand is rich in minerals and can liquefy if the moisture content is more than TML.
6. In such cases where cargo such as river sand that is not included in Appendix 1 of the IMSBC code be loaded with formal permission of the competent authority (local MMD).
7. Vessel Owners/ Managers to inform Masters for ensuring compliance.

### **Enclosure:**

Letter from MMD Kolkata-MMDKOL/51/2023-GSO-KOLKATA (comp no 22645) dated 5 Dec 2024.



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कोलकाता जिला / KOLKATA DISTRICT

**No. MMDKOL/51/2023-GSO-KOLKATA(comp no. 22645)**

**Date: 05/12/2024**

To  
The Chairman,  
All Ports-Kolkata/Haldia/ Paradip/ Dhamra/Gopalpur/Sri Vijaypuram (Port Blair)  
Under MMD, Kolkata Jurisdiction.

**Sub :Letter to Port –Liquefaction and Casualty-Reg.**

Sir,

I am directed to bring to your kind notice the following points related to transportation of sand by ships to and from Indian Ports, particularly at Kolkata, Ports in Andaman and Nicobar Islands, Gopalpur, Haldia, Paradip and Dhamra:-

1. Sand when carried in bulk has to comply with International Maritime Solid Bulk Cargoes Code, here-in after referred as IMSBC Code.
2. The aim of the IMSBC 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 procedures to be adopted when the shipment of solid bulk cargoes is contemplated. The primary hazards associated with the shipment of solid bulk cargoes are those that relate to structural damage due to improper cargo distribution, loss or reduction of stability during a voyage (due to a phenomenon called “liquefaction of cargo”) and chemical reaction of such cargoes.
3. Before accepting a cargo for shipment, it is imperative that **the shipper provides the Master of the vessel in which such cargo is intended to be carried, with valid, up-to-date information about the cargo’s physical and chemical properties.** The necessary information and documentation that need be provided are listed in the Code under “Assessment of acceptability of consignments for safe shipment; Provision of Information”, and includes the appropriate Bulk Cargo Shipping Name and a formal declaration that the cargo information is correct.
4. Individual cargoes are listed in the Schedules which are contained in Appendix 1 of the Code. These describe each cargo’s properties and detail the requirements for handling, stowing and safe carriage.

5. The list of individual cargoes contained in the Code is not exhaustive. If a cargo which is not listed in the Code is presented for shipment, the shipper and the appropriate competent authority(s) must follow the process, mentioned below:
- i. Before loading, the shipper must provide details of the characteristics and properties of the cargo to the competent authority of the port of loading. Based on such information, the competent authority of the port of loading will assess the acceptability of the cargo for shipment.
  - ii. If the assessment defines the cargo as Group A or B, the competent authority(s) will set the suitable conditions for carriage.
  - iii. If the cargo is Group C, its carriage can be authorised by the port of loading and the competent authorities of the unloading port and flag state will be informed of such authorisation.
  - iv. Regardless of the Group of the cargo, the competent authority of the port of loading will give the Master a “declaration”, stating the characteristics of the cargo and the required conditions for carriage and handling. The competent authority of the port of loading is also required to provide the same information to the IMO as per IMSBC code.
6. It has come to our information that sand is being transported, bearing various names, at Indian Ports. However, it may be noted that only following type of sands are listed in Appendix 1 of the IMSBC Code with special loading and documentation requirements, related to the TML (Total Moisture Content):

Cargo Name	Description	Weather Precautions	Special Requirements for carriage
<b>Rutile Sand</b>	Fine particle brown to black sand. Abrasive. Shipped dry	This cargo shall be kept as dry as practicable before loading, during loading and during voyage. This cargo shall not be loaded during precipitation. During loading of this cargo all non-working hatches of the cargo spaces to which this cargo are loaded or to be loaded shall be closed	No special requirements
<b>Sand</b> (Foundry Sand, Silica Sand, Potassium Felspar Sand and Soda Felspar Sand)	Fine particles	Same as above	No special requirements
<b>Sand, Heavy Mineral</b>	A blend of two or more heavy mineral sands. Such sands are characterized by their heavy bulk density and relatively fine grain size. Abrasive. May	Same as above	<b>This cargo may liquefy if shipped at a moisture content in excess of its TML. See sections 7 and 8 of this Code. This type of sand is required to</b>

	be dusty.		be carried on special type of ships detailed in Sub-section 7.3.2 of the IMSBC Code. When carried on ships other than complying with the requirements of sub-section 7.3.2, the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage
<b>SAND, MINERAL CONCENTRATE, RADIOACTIVE MATERIAL, LOW SPECIFICACTIVITY (LSA-I) UN 2912</b>	A concentrate stream resulting from the processing of heavy mineral sands. Such mineral sand concentrates are characterized by their heavy bulk density and relatively fine grain size. This includes concentrates of sands containing natural or depleted uranium and thorium, including metals, mixtures and compounds.	As above	<b>This cargo may liquefy if shipped at a moisture content in excess of its TML. See sections 7 and 8 of this Code.</b> This type of sand is required to be carried on special type of ships detailed in Sub-section 7.3.2 of the IMSBC Code. When carried on ships other than complying with the requirements of sub-section 7.3.2, the moisture content of the cargo shall be kept less than its TML during loading operations and the voyage

7. It is noted that many types of sand, especially with name "River Sand" is transported to & from Indian ports without transparently declaring the cargo and its attendant properties, if such cargo is not listed in the IMSBC Code (**and without any oversight by the MMD/DGS Shipping**). Furthermore, it is a matter of concern that there is no demonstrable evidence of the loading precautions that are being taken, if at all. Over and above, inter alia, such cargo is not only often kept exposed in ports, but also handled without due care during the rains.
8. Publications available on the Internet classify River Sand as rich in mineral and thus requires to have a measure of the Transportable Moisture Content (TML). An advisory from the leading international insurer Skuld (available at [Sand cargoes - Skuld](#)), states as follows:
  - a) Many natural rivers sand is known to be prone to liquefaction when saturated with water. River sand sediment deposits saturated with water are considered to be the prime risk for liquefaction **in earthquake situations**, e.g. in the 1995 Kobe and 2011 Christchurch earthquakes. Materials that can liquefy when saturated with water are classed as Group A in the IMSBC Code and should not be accepted for loading unless the moisture content is below the transportable moisture limit (TML), on the basis of pre-loading sampling and laboratory testing of the actual cargo to be loaded.
  - b) There have been several catastrophic casualties (including loss of lives) which were strongly indicative carrying wet, dredged sands in bulk. Liquefaction of iron sand, a

type of wet beach sand high in iron oxide, has been implicated in the near-capsizing of one vessel in 2007 and the sinking of two vessels in 2012.

9. In the interests of maritime safety & environment protection, it is therefore necessary that a competent authority of the port may ensure:
- i. The Cargo is declared to meet the requirement of IMSBC Code. It may be noted that grain-loading involves the compliance to the mandatory Grain Code of the International Maritime Organization (IMO).
  - ii. In case the cargo as declared is not contained in Appendix 1 of the IMSBC Code, the shipper may be asked to acquire a formal permission from the Competent Authority. The local MMD may need kept be informed in this regard.
  - iii. Loading of cargo which requires, specific “loading precautions” has to be ensured by shipper.
  - iv. Cargoes which mandate declaration of the TML, need to comply with this important requirement. It may be noted that if ships which are constructed as “special type of ships” detailed in Sub-section 7.3.2 of the IMSBC Code, do not need to adhere to the TML requirements as stated above.

Yours faithfully,



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CC – SIC’s MMD Haldia/Sri Vijaypuram (Port Blair)/Paradip