Cargo Liquefaction: A Hidden Danger in Maritime Transport !!

Cargo liquefaction is a significant concern in the shipping industry, posing risks to both safety of seafarers and stability of vessels. Liquefaction occurs when certain types of dry bulk cargoes, such as mineral concentrates, although many other cargoes can also liquefy, such as fluorspar, certain grades of coal, pyrites, mill scale, sinter/pellet feed, etc. undergo a transformation into a fluid-like state during transportation. The cargoes that risk liquefying is listed as Group A in the BC Code. It is, however, a risk that other cargoes not listed as Group A cargo but containing fines and moisture also may risk liquefying.*

The process of cargo liquefaction begins when fine particles of cargo are loaded onto a ship's hold. These particles can retain a considerable amount of water, either through natural moisture or due to rainwater ingress during loading or transport. Once the vessel sails out from loading port, the constant movement and vibration can further increase the moisture content within the cargo, destabilizing it.

Liquified cargo inside hold

The consequences of cargo liquefaction can be catastrophic. As the cargo shifts and settles, it can cause a shift in the vessel's centre of gravity, leading to a loss of stability. This can result in the vessel listing or even capsizing, particularly in rough seas or adverse weather conditions

The sudden and unexpected nature of cargo liquefaction makes it a hidden danger, as its effects may not be immediately apparent to the crew until it's too late.

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Preventive Measures:

Preventing cargo liquefaction requires careful monitoring and adherence to international regulations and best practices. The International Maritime Solid Bulk Cargoes (IMSBC) Code provides guidelines for the safe carriage of solid bulk cargoes, including measures to prevent cargo liquefaction. These guidelines emphasise the importance of accurate cargo moisture content testing and the need for appropriate procedures to be followed during loading, transport, and discharge.

Certification and Documentation:

The most critical information is documentation stating the moisture content and the Transportable Moisture Limit (TML). A cargo is not safe for shipment when the moisture content (MC) exceeds the TML. To find out if a cargo is safe requires the Flow Moisture Point (FMP) to be measured against which the TML is calculated.

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Captain Cankut Küçüktürk has joined Türk P&I Team on August 2020. Once graduated from Deck Department of ITU Maritime Faculty, Capt. Kucukturk started his sea career as Deck Officer and served on board various types and sizes of vessels for 12 years up to the rank of Ocean-Going Master Mariner. In 2010, he joined Kalimbassieris Maritime as Marine Surveyor and Claims Handler for damage, loss and casualty cases on behalf of P&I, H&M Clubs and other marine insurance companies. Additionaly, he performed loss prevention surveys, inspections and audits for various Clubs and Flag States. In 2018, he joined Marsh Insurance Broker and Risk Management as Senior Manager, VP in Placement Department. He recently joined us as Underwriter.

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Pre-Loading Testing: The way these values (TML – FMP) are ascertained, is by way of tests as set out in the Appendix to the BC Code

One can do rough and ready "spot checks" with the so called "can test", but in order to be absolutely sure the cargo must be tested in a lab set up specifically to deal with this issue and such test must be undertaken by suitably qualified persons. The tests have to be done for every cargo lot, as no two cargo lots might be alike.

Moisture Control: Implementing effective moisture control measures, such as proper cargo handling, covering, and appropriate storage conditions prior to loading, can minimize the risk of cargo absorbing excessive moisture.

Stowage and Trim: Proper stowage and trimming of the cargo within the vessel's holds are vital for maintaining stability. Utmost attention should be given to distributing the cargo evenly to prevent localized weight imbalances.

Training and Awareness: Crew member should receive adequate training and be aware of the risks associated with liquefaction. They should understand the proper procedures for handling and monitoring cargo during loading, transportation, and unloading.

Result of Can Testing

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In conclusion, cargo liquefaction is a hidden danger that threatens the safety of maritime transportation. To prevent accidents and save the lives, it is crucial to implement rigorous testing, adhere to international regulations, and provide comprehensive training to crew member. By addressing this issue proactively and fostering collaboration, the maritime industry can minimize the risks associated with cargo liquefaction and ensure the safe transportation of bulk cargoes.