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HONG KONG MERCHANT SHIPPING INFORMATION NOTE

An explosion on board an oil/chemical tanker during cargo tank cleaning operation

To : Shipowners, Ship Managers, Ship Operators, Masters, Officers and Crew

Summary

A violent explosion occurred at the port side manifold on main deck of a Hong Kong registered oil/chemical tanker during cargo tank cleaning operation. This resulted in one death and five injuries of the crew members. This Information Note draws the attention of the shipowners, ship managers, ship operators, masters, officers and crew to the lessons learnt from the accident.

The Incident

1. A Hong Kong registered oil/chemical tanker left the port of Penang, Malaysia to Singapore after completion of discharging two grades of incompatible cargoes, namely Nitric Acid and Acrylonitrile. The chief officer then led the crew members to clean the cargo tanks. Due to the incompatibility of these two grades of cargoes, the port side and starboard side common manifolds were used for discharging Nitric Acid and Acrylonitrile respectively in order to follow the segregation requirement. However, during preparation of the tank cleaning operation, an elbow spool piece was wrongly fitted to the port common manifold with the individual manifold of No.8 port cargo tank (COT No.8 P) that had been loaded with Acrylonitrile.

2. The cleaning operation commenced with those tanks containing cargo residues of Acrylonitrile. About eight minutes later, a violent explosion occurred at the port side common manifold on the main deck and injured six crew members on deck. The vessel returned to Penang and all the injured crew were sent ashore for medical treatment. One of them was certified dead in the hospital on the same day.

3. The investigation had identified the following contributory factors to this accident:

- i. carelessness of the crew resulted in an elbow spool piece being wrongly fitted to the port common manifold with COT No.8 P individual manifold which violated the segregation requirements of two incompatible grades of cargoes;

- ii. the manifold piping arrangements at midship port and starboard sides were complex. But there were no conspicuous markings on the manifolds for the crew to identify the cargo grades inside the manifold; and
- iii. although the leaky cut-off valve of the individual manifold of COT No.8 P was noticed before the accident, no precautionary measure was taken before the commencement of the cleaning operation.

4. The investigation had also found the following safety factors:

- i. no preventive measure was in place to prevent wrong connection of an elbow spool piece which violated the segregation for incompatible cargo grades in the common manifold; and
- ii. the required procedure for verifying the proper connection and isolation of pipelines and hoses by the “line-up checklist” before tank cleaning operation had not been carried out.

Lessons Learnt

5. It is important that all officers and crew of oil/chemical tankers should familiarize themselves with the cargo manifold piping arrangement and follow the ship instruction on handling leaky valves of cargo pipeline during operation. Ship management companies should also review their ships’ procedures for handling incompatible cargoes, taking the following aspects into considerations:

- full risk assessment should be conducted for the tank cleaning operation;
- particular cautions should be highlighted when using the common manifold. Any checklist for verification of pipes line-up should include the use of elbow spool pieces to avoid any violation of the segregation requirement;
- procedures should be developed such as using warning signs, chain lock/seal or barrier on the individual manifold to prevent them from being wrongly connected to the common manifold which may contain incompatible cargo;
- cargo compatibility information should be readily available to all crew members for reference; and
- crew members involved in the cargo tank cleaning operation should attend all relevant safety and tool box meetings.

6. The attention of the shipowners, ship managers, ship operators, masters, officers and crew is drawn on the lessons learnt above.