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19 March 2019

CC(19)03 / OT(19)03

**TO: CHEMICAL CARRIERS and OIL TANKER PANELS**

**Copy: Construction and Equipment Sub-Committee  
All Full and Associate Members**

**MARINE SAFETY INCIDENTS INVOLVING FIRES IN FORECASTLE MACHINERY AND SERVICE SPACES ON CHEMICAL CARRIERS AND OIL TANKERS**

***Action required: Members are advised of findings relating to marine safety incidents involving fires in forecastle machinery and service spaces and invited to note the information provided on recommendations for preventing such incidents. Members are invited to disseminate this information as widely as possible.***

The Secretariat provided the Construction and Equipment Sub-Committee with outline information on a safety issue identified by the IMO Casualty Analysis Working Group (CAWG) relating to historic incidents of fires in forecastle machinery and service spaces on chemical tankers and oil tankers (CE(18)17).

Members advised that the timing of the incidents may mean that the issue of cargo vapour in forecastle service and machinery spaces may have already been addressed by the industry. In this regard, the Secretariat referred the issue to the previous joint meeting of the Chemical Carrier and Oil Tanker Panels (CC(19)02 OT(19)02).

The incidents highlighted by the CAWG involved the following ships:

- **Border Heather** (Oil tanker - 2004);
- **Royal Diamond 7** (Chemical/product tanker – 2012 (1<sup>st</sup> explosion)); and
- **Liang Sheng** (Chemical/product tanker - 2014).

Accident investigations for the three incidents were conducted by the UK, Marshall Islands and Hong Kong, China respectively. The reports are available in the IMO GISIS module for Marine Casualties and Incidents. There are no common owners, shipyards, flag States or classification societies.

In all three cases, the common cause was the presence of cargo vapour in a space (the forecastle store, Bosun's store or bow thruster compartment) which was classified as safe. Consequently, the space contained electrical installations appropriate for a safe area but inappropriate for a hazardous area. Whilst the spaces would usually be safe, under certain foreseeable conditions (inappropriate or failed isolation of a gas-freeing system from cargo

pipings) these spaces became hazardous as they contained a potential source of vapour release (IEC Standard 60092-502:1999, table 1).

Following a further review of the marine safety incident investigation reports and statutory developments, the Secretariat provided the previous joint meeting of the Oil Tanker and Chemical Carrier Panels with a summary of the findings. The Panels noted that:

- All of the ships were less than 10,000 gross tonnage;
- The human element was a contributing factor in at least two of the incidents to the presence of flammable cargo vapour in supply ducts for gas-freeing systems;
- The incident on the **Border Heather** indicate that any space associated with or containing piping that is, at any time, connected to the cargo system should be considered as a dangerous space; and
- The **Royal Diamond 7** indicated that piping that is, at any time, connected to the cargo system should include supply ducts for gas freeing systems which may pass through service or machinery spaces otherwise considered as safe. This includes if the isolation of the gas-freeing system includes physical separation by way of a spectacle blind flange;
- Where supply ducts for gas freeing systems pass through service or machinery spaces otherwise considered as safe, measures should be taken to mitigate against the risk of ignition in the event of flammable cargo vapour migrating into gas-freeing systems. This could be achieved either by having electrical equipment which is safe for the hazardous zone, or introducing gas tight boundaries between supply ducting and the space; and
- No specific statutory work by the IMO has been identified thus far, and nor were Members aware of related guidance.

Consequently, there is the potential for a hazard (cargo vapour present in a compartment considered as safe for the purpose of electrical installations) on chemical carriers and oil tankers which Companies should be made aware of. In this regard Members are recommended to advise Companies operating chemical carriers and oil tankers to:

- Consider inspecting forecastle service or machinery spaces to identify piping and ducting arrangements which could result in the presence of flammable cargo vapour in a space otherwise considered safe. This should include in the event of inappropriate or failed isolations separating gas-freeing systems from cargo pipework;
- Should any such arrangements be identified, consult with the ship's classification society with a view to assessing the risk of fire; and
- Consider a review of the implementation of procedures for familiarization of shipboard personnel with gas-freeing systems, the hazards of unauthorised modifications to such systems, and the procedures for the isolation of gas-freeing systems from cargo piping following gas-freeing operations.

Any questions regarding this circular should be sent to the undersigned ([matthew.williams@ics-shipping.org](mailto:matthew.williams@ics-shipping.org)) and copied to [chris.oliver@ics-shipping.org](mailto:chris.oliver@ics-shipping.org). Copies of the relevant marine safety investigation reports are available on request.

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