



भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS

नौवहन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF SHIPPING, MUMBAI



F.No.25-19011/6/2020-NT-DGS

Date:17.11.2023

Casualty Circular - 02 of 2017

Sub.: Loss of lives of crew members after entering enclosed space (ballast tank)

Summary of Incident:

The subject vessel was an Inland Vessel, which was engaged in lighterage operations with mother vessels for bringing cargo from Mumbai port lighterage area to the docks. On 10.02.2017, it was lightering cargo of wheat from a Singapore flagged vessel, during the loading of the barge, some of the crew members were trying to pump out water from No. 3(S) wing tank using a portable pump. There was some issue in pumping out of the water, hence to check the reason for same, around 2145 hrs one of the crew member went inside the ballast tank, upon not getting any response from the crew member who went inside the ballast tank, two more crew members went inside, however there was no response from them either, thereafter the barge master went down the ballast tank to check the status himself, however he fainted at the bottom of the vertical ladder. Thereafter, another crew member went down, but sensing something wrong he immediately came out and was rescued by other crew.

Thereafter, the Port and MRCC was informed, and entry was made using breathing apparatus, the crew members were found dead inside the tank, and the Master was found unconscious, and was rescued from the tank. The Master and other crew who came out of the tank, were shifted to hospital immediately, however the Master did not survive. The barge was then brought to dock and remaining three bodies were recovered from the tank.

During investigation, it was observed that the tanks had high concentration of CO (19 PPM), H₂S (32 PPM) and PH₃ (22 PPM). This indicated presence of extremely toxic gas 'Phosphine' also in the 3(S) tank, it may be noted that Phosphine is the most widely used fumigant on board ships carrying grain cargoes. Hence, giving clear indication that the residues of fumigant got transferred along with the grain cargo from the mother vessels to the barge, since the barge was engaged in lighterage of grain cargoes for a period of three to four months preceding the casualty. Further, due to pitting in the hold, which were inadequately repaired, some of the cargo along with the fumigant leaked in the 3(S) tank, which lead to loss of lives of crew members who went inside the tank.

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Causal Factors:

1. Entry was made in the tank without following any safety procedures.
2. Water entered into the tank / space due to holes in the shell plating.
3. Cargo i.e grain entered the tank space due to holes in the cargo hold.
4. Toxic gas was present due to accumulation of grain cargo in the tank / space which remained soaked in water for considerable period, and also due to residues of fumigant which entered into tank and these factors resulted in extremely lethal phosphine gas in the tank.
5. The mother vessel was fumigated using Aluminum Phosphate tablets but holds were not ventilated or gas freed as per procedures.

Action Taken:

1. MRCC and Port control was intimated regarding the incident.
2. Entry was done using breathing apparatus to rescue the personnel, one found unconscious was evacuated and transferred to hospital.
3. Bodies of three crew members were removed from the tank.

Lessons Learnt:

1. Enclosed space entry procedures are to be followed at all times, and no entry into enclosed space should be made without required checks and precautions.
2. Barges in operation should be maintained in good condition without any leakages from hull or cargo holds.
3. The inland vessel crew should be trained adequately to be able to handle all perceived risks of the job.
4. Merchant vessels loading or discharging grain cargo's should comply with recommendations on the safe use of pesticide in cargo holds.



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To,
All stakeholders through DGS website.