



SHIPOWNERS

SECURITY FOR SMALL & SPECIALIST VESSELS

► CASE STUDY

Severe injury from exposure to ammonia

Category: Operations

Vessel type: Fishing

Issue date: 14/05/2014

Case number: 105526

The incident

This unfortunate incident occurred on a fishing vessel whilst unloading a catch from the vessel's holds.

A shore side crane, operated by a stevedore, was being used to discharge fish. During a load, heavy contact was made with a vessel refrigeration pipe causing it to rupture at the weld and leak ammonia gas into the hold. Three stevedores assisting with the prevailing operation managed to leave the hold when the ammonia started to leak. However, the stevedore, who was closest to the pipe when it ruptured, suffered severe ammonia burns to his eyes and lungs. His injuries were so severe that it resulted in instant hospitalisation, with the prognosis of ongoing medical care for the rest of his life.

It is industry practice to isolate a hold's refrigeration system by draining back the ammonia into the reserve storage before unloading commences. This is to ensure that no leakage of ammonia gas occurs if there is a breach in the system.

The subsequent investigation into the incident found that the vessel's refrigeration system, which utilised ammonia, had not been fully isolated and therefore ammonia gases had not been vacuumed from the system when unloading had commenced. Only after the leak had occurred did the system become completely isolated when the valves were fully closed, stopping further ammonia entering the hold.

Observations

- It is imperative to check that the vessel's refrigeration system is fully isolated and vacuumed prior to any operations being carried out in the hold. Failure to do so exposes anyone in the vicinity to the risk of severe injury or death if the system is damaged and a leak occurs.
- In this incident it was the chief engineer's responsibility to isolate the system but investigation discovered that he had been late to begin the isolation process. This resulted

in the gas not being fully vacuumed from the system.

In addition, the isolation valves had not been properly closed when unloading had begun due to a lack of time.

- It is vital that all crew are fully informed of the associated dangers of ammonia, the operating criteria of the on board system and the emergency contingency plans in case of refrigerant leaks.
- Crew must ensure that correct procedures are followed to prepare the vessel for carrying out cargo operations and that positive reporting is recorded.
- All appropriate safety equipment, such as breathing apparatus, must be located nearby prior to commencing operations and the on board crew trained on its use.

Financial Cost

US\$1,110,639.12.