

# MAIB

MARINE ACCIDENT INVESTIGATION BRANCH

## FLYER TO THE SHIPPING, TANK STORAGE AND CARGO INSPECTION INDUSTRIES

### *Jo Eik*

#### Release of cargo vapours resulting in two casualties



On 6 May 2009 the Norwegian registered chemical tanker *Jo Eik* completed a ship to ship transfer (StS) of a cargo of Crude Sulphate Turpentine (CST) at the Vopak Terminal Teesside. During the final stripping following the mandatory MARPOL pre-wash, a deck rating became unconscious following exposure to CST vapours. The chief officer, who attempted a rescue, was also overcome and another deck rating suffered the effects of vapour inhalation but managed to escape unaided. Both casualties were rescued and made a full recovery.

Before loading the unfamiliar CST cargo at Savannah, USA, the chief officer conducted a pre-arrival conference, but he did not have the cargo Material Safety Data Sheet (MSDS) at the time and so the safety briefing did not properly cover the cargo hazards, which unbeknown to him contained hydrogen sulphide ( $H_2S$ ), organo-sulphides and mercaptans. A cargo specific MSDS was later handed to him by the shipper. In the meantime the ship manager obtained an MSDS which was ***not*** cargo specific and which did not mention  $H_2S$ . This MSDS was passed to the agent, the receiving StS ship and the terminal staff. It was not passed to the cargo surveyor who obtained a generic MSDS from the internet. As a result he equipped himself with the incorrect respirator filter to protect against  $H_2S$  vapours.

A Teesside pre-arrival conference was not held and the crew were not advised to take any particular precautions. It is of note that the Safety Management System was explicit in its direction to use breathing apparatus (BA) where there was a risk of cargo vapour inhalation.

The ship's cargo Procedures and Arrangements Manual specified that the fixed washing systems should be the normal method of tank cleaning. However, only 7 out of 65 were functional, so it had become normal practice to use the portable washers which were passed through open Butterworth hatches. As the tank atmosphere was agitated, dense cargo vapours were driven through the open hatch and accumulated in the enclosed area around it.

Although part of the weather deck, the area around the hatch fell into the International Maritime Organization's definition of an enclosed space. However, this was not identified by the crew, so there were no warning signs. Despite the strong pungent smell of the released vapours, the hazards were not recognised. The casualties exhibited the classic signs of  $H_2S$  / mercaptan inhalation.



Open inboard hatch

## Safety Lessons

This is the fourth MAIB investigation since September 2007 which has related to oxygen depleted or contaminated atmospheres. The previous three accidents resulted in the deaths of six seafarers. In all cases the following issues have been identified:

- **Complacency leading to lapses in procedure** – on *Jo Eik* there were inadequate safety briefings, non use of breathing apparatus, acceptance of chemical smells and fixed washing system defects. These points were adequately covered in the SMS: for their own safety, officers and crew must take ownership of, and properly implement the SMS instructions.
- **Potentially dangerous spaces not being identified** – on *Jo Eik* the area around the Butterworth hatch was effectively in an enclosed space. The surrounding construction impeded air flows from dissipating cargo vapours. There are many such areas on ships. They should be identified and risk assessments conducted to determine the appropriate risk control measures.
- **Would-be rescuers acting on instinct and emotion rather than knowledge and training** – on *Jo Eik* the initial rescue was attempted without BA and without testing the atmosphere. Realistic drills should be regularly carried out and critically assessed so that equipment and manpower resources are used to best effect. In this case the chief officer was nominated to lead the rescue; he would have been more effective in an “on-scene commander’s” role.

Additionally in this case:

- **Use of different MSDSs** – there were two different MSDSs in use. The one obtained by the vessel’s managers did not specify all the cargo’s components and so decisions made about safety measures that might be required were based on inaccurate information. Ship managers should take action to ensure that the cargo specific MSDS is promulgated to receivers (whether they be terminals or transshipment vessels/barges) either directly or via the ship operator or agent.

This flyer and the MAIB’s investigation report are posted on its website:

[www.maib.gov.uk](http://www.maib.gov.uk)

Alternatively, a copy of the flyer and / or report will be sent on request, free of charge.

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