

Case study for onboard safety meeting

Entry into enclosed space

Please read the below description of an incident. Keeping your company's standards and vessel procedures in mind while reading to compare with the actions of the crew below. We will discuss the factors which led to the incident occurring and how to avoid it from happening on our vessel.

The vessel was on a laden voyage to the Far East. During the last month the crew had been inspecting the vessel's topside ballast tanks, noting condition of steel and paintwork. The crew was now about to inspect the last ballast tank, the no. 1 port.

The air pipes of the tank had been closed off for some time. To air the tank the crew had opened both manholes on deck, one forward and one in the aft end of the tank. An electric fan normally used to air the tanks was faulty and could not be used.

Three crew members were preparing to carry out the inspection. One OS was positioned on deck as a guard and attendant, while the 2nd Officer and one AB were to inspect the tank. As the 2nd Officer entered the tank, he complained about the hot, damp air and that he could hardly see anything in the poor light of his torch. He asked the AB to get a stronger light before entering the tank, and to bring new batteries as well.

The 2nd Officer remained in the tank, while the OS remained on deck awaiting the AB's return. After a while the OS tried to look into the tank, but saw at first nothing. He called to his colleague, but received no answer. Entering the manhole to get a better view, he discovered the 2nd Officer lying motionless at the bottom of the tank. He climbed down the rest of the ladder to try to shake him awake. When he reached the bottom of the tank he lost consciousness.

It took the AB 10 minutes to return, and he found no one on deck upon his return. Looking into the tank, he saw two lifeless bodies. His first thought was to enter, but remembered previous advice about such accidents and rushed instead to raise the alarm.

The Chief Officer took charge and ordered a set of breathing apparatus belonging to the fireman outfit to be brought forward, along with a rope and a stretcher. He also sent for an oxygen content meter. It was discovered that the air bottles were empty, as they had not been refilled after a previous fire exercise. Spare air bottles were sent for and once they had been replaced a rescuer was sent into the tank.

It was very difficult to get the two persons out of the narrow manhole. The OS regained consciousness when he was brought up to the deck but it was discovered that the 2nd Officer was not breathing. Several attempts were made to revive the 2nd Officer without success.

The OS said that he had felt no bad smell, no pain, had no warning of lack of oxygen before his legs gave way and he felt a need to sit down.

Investigations concluded that the heavy corrosion of the tank had depleted it of oxygen. The limited airing of the tank by only opening the manhole covers for a couple of hours had not been enough to provide sufficient oxygen in the tank. It was also discovered that the oxygen content meter had not been calibrated in accordance with manufacturers recommendations.

How to improve by lessons learnt

Based on the case and the keywords, you should now perform an onboard risk assessment of the incident and the factors which led to it. Bear in mind our vessel's procedures. You can also discuss the keywords below to determine onboard areas/topics for increased awareness:

1. The procedures to air the tank and test the atmosphere prior to enter
2. Emergency evacuation of crew member in tank
3. Duties and role for guard or "attendant" on deck
4. Which senior onboard to be notified prior to entering
5. Testing procedures of equipment prior to enter
6. Awareness of expiry date on oxygen content meter – are ours OK?
7. Available safety equipment prior of entering (breathing apparatus, O2 meter, air bottles, torches, security lines etc.)
8. Why are corroded tanks more dangerous than non-corroded tanks?
9. Knowledge of the useful IMO recommendations in IMO res A.1050(27) – Revised recommendations for entering enclosed spaces aboard ships
10. Knowledge of the content of SOLAS regulation III/19 related to mandatory enclosed space entry and rescue drills to be held every two months

1 What factors contributed to the incident in the above case?

2 Risk Assessment: Could some of the factors identified be present on board your ship? How frequent could they be present? How severe could it be if they are present?

3 In the risk transfer zone (yellow and red), what would you suggest as measures to control the risk? Any additional barriers that could be introduced?