Fatality in ballast water tank – working at height in a confined space

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A Member has reported an incident in which a crewman died after falling in a confined space onboard a vessel.

What happened?

A ballast tank was open for steel repairs; permits to work were in place for these repairs. The incident occurred during an investigation of air quality and gas detectors in this tank. A tank or manhole watch was present, and three persons entered the tank and began to climb down. The checks were performed and the three persons began to climb the 11m ladder out of the tank.

The last person climbing up had the gas detector in front of him on a band around his neck; the detector was attached to a rope on his back. The gas detector got stuck between him and the ladder when he was nearly at the top. He tried to free himself but lost his grip and fell 10m to the bottom of the tank, and suffered serious internal injuries.

He was evacuated from the ballast tank and subsequently med-evaced by helicopter but died on the way to hospital.

Our Member's investigation revealed the following primary contributing factors:

- The position of the gas meter being carried by the casualty whilst climbing the ladder. He was carrying the gas meter on his abdomen during his ascent of a vertical ladder.
- Carrying the gas meter on the abdomen during descent and ascent of a vertical ladder was not recognized as a risk or hazard.
- Absence of fall protection, whilst the existing Job Safety Analysis for entering a confined space makes mention of fall protection, this was not discussed at the toolbox meeting prior to the job starting. Also, there was no permit to work (PTW) in place for the entry of confined space. This meant that the persons involved were not reminded about the recommendation for fall protection.

Our Member identified a number of secondary contributing factors:

- The gas measurements in confined spaces were considered 'routine', whereby the need for, PTW and identification of associated risk/hazards were overlooked.
- Inadequate monitoring of compliance – the confined space had been open for

over a week; multiple activities had taken place, with PTW, in that time, but nobody had recognized the absence of the fall protection (inertia reels) as described in an existing job safety analysis (JSA).
- Failure to follow rules & regulations – two key company rules were not followed:
  - The requirement to issue a PTW for the gas measurement and inspection activity in the confined spaces
  - Existing company procedures for working in confined space
- Organisation – the casualty was performing safety officer duties for which he did not have the relevant formal training and competence.
- Existing procedures or instructions were not adequate and did not identify requirements for descending & ascending into (ballast) tanks.

Conclusion, Recommendations and Lessons Learnt

Our member concluded that the following safety barriers were breached:

- Complacency in properly executing safety procedures.
- Failure to follow procedures.
- Not recognising hazards and risks associated with the job.
- Insufficient training and instructions.

The following lessons were learnt:

- No equipment to be carried by hand or other means which impacts safe climbing or descending on ladders.
- Company procedures provide no clarity with regard to maximum length of ladders and fall protection to be used.
- Preventive safety equipment to be used for climbing on ladders
  - Decent anchor point to be made
  - Safety Harnesses (lanyards & shock absorber to be removed) and life lines (as fall arrestors) to be used;
- Preventive measures to be taken while working in confined spaces
  - Escape route should be determined and prepared before job starts
  - Rescue equipment should be readily available at confined spaces in which work is being done
- Helicopter evacuation procedure should be improved.
- Communication in emergency situations to be reviewed and improved, along with an increase of on board emergency training related to confined spaces.
- Work assessment/risk assessment to be done prior to start of onboard repair and maintenance jobs.

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