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MARS 202530

Three enclosed space fatalities

An anchored bulk carrier was preparing to load coal. The chief officer and a surveyor completed the ship-shore safety checklist and a floating crane was secured on the bulk carrier's starboard side to load coal from open barges towed from shore.

Loading was planned to take place into nine cargo holds over eight days or more. There were frequent stops due to barge logistics and heavy rain showers that required the hatch covers to be closed to prevent the cargo becoming saturated.

On day 8, the twentieth barge came alongside at 0320. Loading into cargo hold No.7 resumed at 0325 and continued until 0630, when a bulldozer was lifted into the hold to trim off the cargo. At 0830, the daily testing of hold atmospheres was completed through the testing point on the hold hatches using a portable gas detector. Cargo hold No.8 was noted to have 8% lower explosive limit (LEL) methane, 225 parts per million (ppm) carbon monoxide, and 5.8% oxygen.

At 0840, heavy rain caused cargo work to be stopped, and about 20 minutes later all cargo hatches were closed. Bulldozer operator 1 left the bulldozer in cargo hold No.7 and exited the hold. At about 1236, bulldozer operator 2 arrived on the bulk carrier's main deck. As the rain had stopped, he asked the foreman to have the hatch cover to cargo hold No.7 opened to complete the trimming operation in the hold. The foreman relayed the request to the vessel's duty officer by VHF radio.

Soon after the call, crew opened the hatch of cargo hold No.7. CCTV cameras on the vessel's main deck recorded bulldozer operator 2 making several solo entries into the cargo holds. At about

1305, the assistant foreman went to check on the progress in cargo hold No.7 but could not hear the bulldozer working. He checked the main deck surrounding cargo hold No.7 before returning aft. Further checks failed to find the missing bulldozer operator.

Some minutes later, the assistant foreman entered hold no 7 via the forward booby hatch to continue looking for bulldozer operator 2. Still unsuccessful, he climbed onto the port side hatch coaming of hold No.7 and walked aft, pausing to check the hold as he went. Seeing that hold No.8 forward booby hatch was open he went over to look inside. He saw bulldozer operator 2 lying apparently unconscious in the access space on the deck below.

The assistant foreman immediately raised the alarm. Crew gathered, and the 2/O told the assistant foreman that no one should enter the space. The 2/O and two crew then ran to retrieve the ship's rescue equipment, which included breathing apparatus (BA) sets.

By this time, about six stevedores had assembled by the booby hatch. At 1329, a stevedore and the foreman descended the ladder into cargo hold No.8 forward cargo access space to try to rescue their colleague. Within seconds they collapsed unconscious. Three minutes later, the bulk carrier's rescue team arrived on scene and saw that there were now three casualties in the space. After testing the atmosphere, the rescue team entered the access space with BA gear. Within nine minutes all three victims had been brought to the main deck. Cardiopulmonary resuscitation and oxygen were administered but none of the victims regained consciousness. The victims were transferred ashore where they were later declared deceased.

The investigation found, among other things, that none of the victims had completed

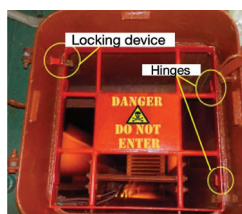
enclosed space awareness training. Post mortem examinations were not conducted, and the cause of death was not confirmed. However, atmospheric readings taken at the forward access space to cargo hold No.8 after the accident show a deficiency of oxygen and a high level of H₂S. It is highly likely that the noxious air caused the victims to become incapacitated upon entry into the cargo access space, and the resulting accelerated shutdown of their brain and/or lungs led to their death.



As with many enclosed space entry casualties, warnings on access hatches go unheeded or unseen

Lessons learned

- Effective access control, either by a physical barrier or robust entry procedures that prevent easy access to hold spaces, will reduce enclosed space casualties.
- Enclosed space awareness training for stevedores will enhance safety on vessels.
- A false sense of security is easily set in place. In this instance, there had been many days of loading with less than adequate control over hold access with no apparent consequences. Then disaster struck – a stevedore entered hold 8 which had noxious gases. As rescue operations were mustered, less than adequate ‘accident scene control’ allowed two more fatalities to occur.



Post-accident risk mitigation: a physical barrier for an open access hatch

Editor’s note: While adding another physical barrier may help reduce unauthorised enclosed space entry, poor procedural integrity can nullify this barrier.



As edited from MAIB (UK) report 5/2025

MARS 20253

Grinder causes fatal bleeding

Deck crew were undertaking normal maintenance jobs on a loaded bulk carrier at sea. The plan for the day included washing the open deck areas on the main deck and exterior accommodation. The Chief Officer held a toolbox meeting, during which the crew members were divided into four teams. The bosun was assigned to wash the aft upper deck.

During these operations, the bosun left his cleaning station and walked forward. He met some members of the other work teams on the way and had a conversation with them before entering the port side forecastle store.

At about 0945, a crew member on the main deck heard someone calling loudly from forward. He turned around to see the bosun standing nearby, using his right hand to support his heavily bleeding left arm. The crew member immediately informed his teammates. They assisted the bosun to lie on the deck and applied first aid. They attempted to minimise the bleeding and then carried him to the vessel’s hospital.

A pool of blood was discovered at the area where the bosun had been working, along with a cut fire hose and a grinder. The grinder was connected to an electric power extension unit on the deck, and was switched off.

The Master joined the crew at the hospital and found the victim had a serious cut with severe bleeding on his left arm. The Master contacted the company for emergency medical assistance and altered the ship’s course towards the closest port of refuge. He also contacted the local Coast Guard to request an emergency helicopter transfer to a shore hospital. However, the vessel was beyond the helicopter’s maximum range. A meeting point was arranged and the vessel sailed at full speed towards it.

Crew members closely monitored the bosun’s condition and provided medical care based on guidance from a shore doctor. At 1525 hours, the bosun was unconscious with a weak pulse. Crew members performed CPR, and continued even after the helicopter reached the vessel at 1740 hours.

The bosun was airlifted to shore and then transferred by ambulance to hospital. Unfortunately, at 2047 hours, the bosun was pronounced dead.

Lessons learned

- Copious bleeding from a large artery is an emergency. In this case crew attempted to control the bleeding and were guided by

a shore doctor but in the end the victim succumbed to his injuries. The report does not mention whether a tourniquet was used to control the bleeding.

- Grinders are powerful tools that must be used appropriately. Proper guards and PPE are a must, as is proper use of the tool. It takes both hands to safely use a grinder.



As edited from MAIS (Hong Kong)
report from 7 September 2023

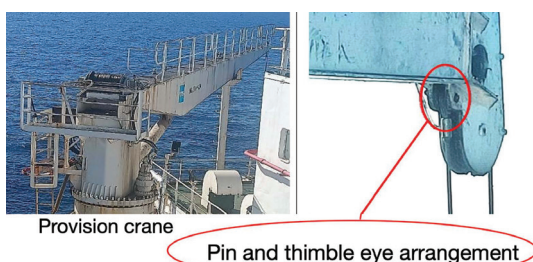
MARS 202532

Crane test reveals installation mistake

A cargo vessel was undergoing maintenance in a shipyard. Work on the provision crane was in progress and staging had been rigged to give access to the crane's hydraulic ram, which was dismantled for overhauling. While maintenance work was still in progress on the hydraulic ram, ship's crew were assigned to change the crane's hoisting wire.

There was no staging rigged at this location. In order to connect the thimble end of the new wire to the securing point at the head of the crane boom, a crew member lay on his stomach over the crane boom and inserted the locking pin through the thimble eye with his outstretched hands. Essentially working by feel alone, the crew member inadvertently and unknowingly put the pin back in place without passing it through the thimble. The thimble remained in place, stuck between the boom structure and the locking pin.

Three days later, the hydraulic ram had been fitted, and the provision crane was load tested. A water bag of the required weight was lifted and swung outboard. As the load came on the wire, the thimble eye of the hoisting wire came out of its stuck position. The crane's block, water bag and dynamometer fell in the water. They were later retrieved by shipyard staff.



Provision crane

Pin and thimble eye arrangement

Lessons learned

- After any safety significant work by crew, a senior officer should undertake a close-up inspection of the finished task for quality assurance.
- Proper access to the workspace is a must. Never 'work blind'.

MARS 202533

Laser light used to attract attention

Vessel A was undertaking exercises in darkness and, as such, was restricted in its ability to manoeuvre. The vessel was displaying the lights appropriate for this situation. Crew detected a nearby drifting vessel. It was indicating, via its lights, that it was not under command (NUC). The drifting vessel also had deck and accommodation lights which obscured its sidelights.

As vessel A closed on the drifting vessel, at about 0.6nm, a green laser was seen shining into its bridge coming from the drifting vessel. The crew contacted the drifting vessel to inform them to stop this practice.

Fortunately, at the time of the lasering, no one on Vessel A's bridge was looking at the other vessel through binoculars and so the risk of an ocular injury was avoided. At no time did the NUC vessel attempt to use their signal lamp or ship's horn in accordance with the collision regulations.

Lessons learned

- Lasering another vessel to attract their attention is not advisable. Not only can this cause eye injuries, it is also a particularly inefficient method of attracting attention.
- The collision regulations (Colregs) call for five or more short blasts of the ship's horn to indicate to another vessel that there is danger and to attract their attention.
- The vessel's Aldis lamp or searchlight can also be used to attract the attention of another bridge team.
- A drifting vessel is considered underway and should be ready to act according to the Colregs. In this case it is unknown if the drifting vessel was well and truly NUC (i.e. some exceptional circumstance made it unable to manoeuvre as required by the Colregs). Nonetheless, it is unacceptable to indicate NUC status to 'exempt' a drifting vessel from the onus of manoeuvring as per the Colregs.
- The use of a laser to attract attention was also noted in MARS 202244.

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