MARS – Lessons Learned

MARS Report No 379 May 2024

MARS 202424

Enclosed space claims one victim but spares two others

As edited from TSIB (Singapore) report TIB/MAI/CAS.122
https://tinyurl.com/MARS202424

➔ A bulk carrier loaded with a cargo of coal was at anchor. Deck crew were tasked with greasing the dog handles of the hold access booby hatches. Some of the handles were rusted shut and needed to be disassembled before they could be greased.

Four crew members were working to free the dog handles at one of the booby hatches. The booby hatch was open while they were doing this, and a disassembled dog handle fell down the hatch. One man climbed down to retrieve it. As he climbed back up with the retrieved dog handle, he lost consciousness due to a lack of oxygen, fell and landed on the coal cargo about 3.5 metres below.

The alarm was immediately raised and the crew mobilised to rescue the victim. An officer arrived at the booby hatch with an Emergency Escape Breathing Device (EEBD) hood and entered the cargo hold through the booby hatch ladder. Meanwhile two air hoses were being connected to the air supply in an attempt to supply air to the hold. The officer that had entered the booby hatch with the EEBD soon came out, saying that it was difficult to breathe and hot in the cargo hold.

The chief cook, of his own accord, then took affairs into his own hands. He grabbed the two air hoses, a safety harness and ropes and descended into the hold to attempt a rescue. Within five minutes, the cook had managed to secure the safety harness below the arms of the victim and the crew on the main deck were able to pull him out; the cook exited the hold soon after. The victim was not breathing and there was no heartbeat or pulse. CPR was performed on the victim and he was evacuated ashore but to no avail – he was declared deceased.

Lessons learned

- In an emergency rescue, the atmosphere of an enclosed space should always be considered unsafe unless confirmed otherwise.
- An EEBD should never be used to rescue a victim in an enclosed space. This equipment is only for escaping from a compartment that has a hazardous atmosphere and should not be used for entering oxygen deficient voids or tanks on board ships.
- Many enclosed space emergencies have claimed extra victims; persons attempting to rescue the initial victim have themselves succumbed to the lack of oxygen in the course of improvised and poorly executed rescue actions. In this case, the cook and the officer with the EEBD were just 'lucky'.
- Vessel leaders must take charge in situations such as this accident. The officer should never have entered the hold with only an EEBD and the cook should have been immediately stopped from entering the hold.
- Although enclosed space rescue exercises are now mandatory on vessels, the 'elephant in the room' – the problem that is not discussed – remains the lack of standardised and comprehensive training for crew (how can you practise what you don't know how to do?) and the lack of mandatory rescue equipment that should be kept on board. This paradox was raised in a *Seaways* article of June 2021 and can be accessed here: https://safeship.ca/uploads/3/4/4/9/34499158/enclosed_space_rescue-the_elephant_in_the_room_seaways_june_2021.pdf
- Another 'elephant in the room' is the unwritten understanding that, if the atmosphere is not breathable, an enclosed space rescue will be accomplished with firefighting breathing apparatus (BA) equipment. Although better than nothing, arguably, this equipment is very bulky and could hinder the rescue or otherwise be counterproductive. Slim-line rescue BA equipment is available in other industries, but to date there is no requirement for its use in the marine industry.
- Another enclosed space rescue attempt gone wrong can be found at MARS202124.

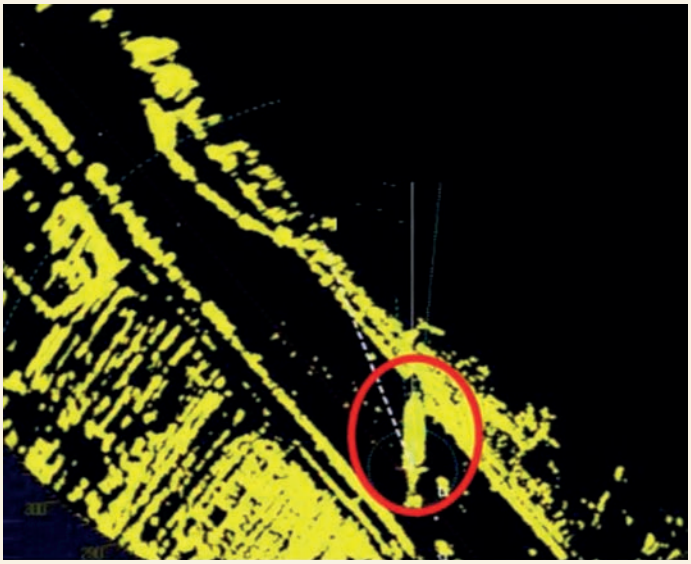
MARS 202425

Vessel speed exacerbates bank suction, take two

➔ A 274m long tanker was making way in a canal under pilotage at about nine knots (slow ahead). As the passage progressed, the pilot conned the vessel closer to the port side of the canal in order to pass some anchored vessels to starboard.

The pilot requested the helmsman to steer a course of 000 degrees, which he was able to do, but with some difficulty. In order to maintain the required course he was applying 20 to 30 degrees port helm. This was a strong indicator of bank suction aft. It does not appear that the bridge team were aware of the situation.

At one point, the pilot requested a course change to 002 degrees. The helmsman complied by easing the helm to midships for a brief instant. As soon as this was done the vessel took a strong shear to starboard; the helmsman rapidly applied 30 degrees of port helm in an attempt to stop the swing but this had no effect. The pilot ordered full astern, which slowed the vessel, but it continued to swing to starboard despite this and came crosswise in the canal before stopping.



Tanker crosswise in the canal

Lessons learned

This is an almost identical incident to that of MARS202413. A vessel in a restricted waterway is experiencing bank suction aft due to being too close to the bank at a speed that is too high for the circumstances – even though it is only nine knots. The helmsman is using extreme helm to hold the desired course but as soon as this helm is eased or put to midships, the vessel swings inexorably to the opposite bank.

- Keen situational awareness and good communication are key to avoiding this situation. If extreme helm is required to hold the vessel steady in a restricted waterway, speed must be reduced as soon as possible before removing the helm. In other words, the pilot and OOW should be keeping an eye on the helm applications to better judge the strength of bank effect on the vessel.
- If the pilot and OOW are otherwise occupied, the helmsman should warn the pilot and OOW of the extreme helm application.

MARS 202426

Fan blade finger injury

➔ A tanker was at anchor near a port and some maintenance was being carried out. The electrician and two engineers were carrying out maintenance work on one of the engine room supply fans. As they attempted to open the fan cover, the electrician put his fingers between the cover of the fan and the impeller blades. The blades were still turning.

The victim suffered a deep laceration to the ring finger of the right hand, even though he was wearing gloves. The victim was sent ashore where surgery had to be performed and he was subsequently repatriated for recovery.

Lessons learned

- Injuries are prevented by using adequate lock out/tag out procedures (LOTO). This appears to not have been the case in this accident.
- Keep your hands safe. Never use your hands to do a task that can be done with a tool.
- Hazard identification prior to any work activity is essential in minimising risks. Use the 'TAKE 5' safety practice before any work activity (https://safetyculture.com/topics/take-5-safety/).
- Proper supervision can prevent accidents.

MARS 202427

Dangerous gas-freeing practice claims one victim

As edited from official TSIB (Singapore) report TIB/MAI/CAS.126
https://tinyurl.com/MARS202427

➔ An oil/chemical tanker was underway. The cargo tanks had been cleaned in preparation for a docking survey and the Chief Officer (CO) had lined up the clean tanks for gas-freeing.

Three tanks were connected to a common pipeline. Fresh air from the fixed gas-freeing air fan inside the ballast pump room was directed through the pipeline to a portable air chute directing the air into the tanks. Once the line-up was completed gas-freeing commenced. The CO gave verbal instructions for completing the gas-freeing operations before retiring to his cabin for rest.

At about 23:50, a relieving bridge crew member (lookout) met up with the out-going lookout. They both went on deck to change the portable air chute from one tank to another. After completing the task, the off-watch crew member stood down and the on-duty crew member returned to the bridge to join the Officer of the Watch (OOW) as lookout.

About two hours later, the lookout left the bridge to change the portable air chute to the third tank, according to the instructions given by the CO. As the lookout left the accommodation block and went on deck he performed a VHF radio check with the OOW on the bridge, which was acknowledged.

About 20 minutes after the lookout's last VHF report, the OOW called back to check the status of the task but did not receive a response. The OOW tried a few more calls, without success. The OOW then called other common spaces inside the accommodation using the ship's internal telephone but could not locate the lookout. He then called the duty engineer and requested assistance to locate the lookout.

Soon after the victim was found lying unconscious on the starboard side main deck. The Master was informed and the alarm was raised. There were no signs of injury on the victim's body but there were no signs of breathing either and no pulse was detected. CPR was commenced and continued for many hours but the efforts were fruitless. The victim was declared deceased and the vessel proceeded to a nearby port to disembark the body.

Some of the official report findings, among others, were:

- After tank cleaning, the tank cleaning hatch (TCH) had been kept open and the oil tight hatch (OTH) was cracked open for the gas-freeing operation. This allowed gas vapours to accumulate on deck (open loop). This practice deviated from the company's Safety Management System (SMS) requirement that flammable and/or toxic gases from tanks could be vented only through the approved tank venting system (closed loop).
- The gas-freeing operation was conducted by directly connecting the portable air chutes to the tank cleaning hatches. The atmosphere of the tanks was not checked to verify gas concentration was within safe limits before connecting the chutes.
- The fixed gas-freeing fan was not stopped before the portable chute was changed from one tank to another.
- The victim had likely inhaled remnants of nitrogen gas and/or toxic vapours while changing the portable chute from one tank to another.
- The victim was not carrying a portable gas detector which could have alerted him of the low oxygen level or presence of toxic gases on deck. But neither had he been instructed to do so.

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Portable air chute connected to TCH

OTH 'cracked' open

- When a lookout performs deck work the duties of lookout are not being accomplished.

Lessons learned

- Nitrogen in concentration is lethal and one breath is enough to cause unconsciousness.
- A person need not be in a confined space to inhale a deadly concentration of noxious gas.
- Safety 'slippage' happens when procedures are not followed and work practices begin tipping into the danger zone. In this case, deck crew and officers did not appear to be aware of the SMS procedure.
- It is not enough to establish procedures without also ensuring the necessary training in their application and actual implementation in practice.

■ **Editor's note:** Twenty years after the *Bow Mariner* explosion claimed 21 lives, it is hard to understand why the practice of open tank hatches during tank cleaning continues (as on the *Bow Mariner*) or that it is used as a means to gas-free cargo tanks on chemical tankers.

MARS 202428

Green water on deck causes one fatality and several injuries

As edited from Marshall Islands Maritime Administrator report published August 2021
https://tinyurl.com/MARS202428

➔ A loaded chemical/oil products tanker was underway in heavy weather. The vessel was facing 6m head seas and water was frequently shipping over the bow and forecastle. Speed was reduced to about 6 knots and crew were not allowed on deck.

The water ingress alarm for the bosun's store sounded in the engine control room, and the duty engineer immediately notified the Officer of the Watch (OOW) on the bridge. It was suspected that the forecastle deck hatch (1.4m X 1m) to the bosun's store had been compromised, allowing water to enter the compartment. The Master considered that uncontrolled flooding of the bosun's store could have an adverse effect on the ship's trim and stability. He decided that immediate action must be taken to investigate the water ingress and reduce the flooding. The Master did not seek assistance from the company with calculating the effect on the ship's stability of the flooded bosun's store, nor was the company notified of the water ingress.

The Master attempted to turn the ship 180 degrees to decrease the water being shipped before the crew went forward but the vessel rolled so much that this was not possible. Six crew then went on deck and made their way to the forecastle. They were wearing the required PPE, including lifejackets and safety harnesses attached to lifelines. They found that the forward edge of the deck hatch and coaming had been slightly deformed inward. This created a small gap between the hatch cover gasket and the hatch coaming which was allowing water to enter the bosun's store with each successive wave that broke over the bow.

It was decided that the entire hatch would be covered to slow the water ingress. The crew began to bind rubber and plastic over the damaged hatch. Suddenly, a large wave broke over the bow and the crewmembers working forward were knocked off their feet and swept across the deck. All the crewmembers' lifelines were still attached at the time. The Master raised the alarm and ordered additional crewmembers to don PPE for working on deck. The rescue party went forward with first aid supplies and a stretcher. Five crew were found injured while one was uninjured. All five injured crewmembers were taken to the ship's hospital.

All five victims had serious injuries; one victim had suffered a significant injury to his forehead and was in critical condition. Despite best efforts, the Master pronounced the victim deceased later that day.

Lessons learned

- Even with lifelines secured and PPE, going forward with water on deck can be a very dangerous endeavour.
- When in doubt, contact the company to receive guidance. In this case, a stability calculation may have shown that even with a flooded bosun's store the vessel would have been safe and sending crew forward an unnecessary risk.

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