MARS – Lessons Learned

MARS Report No 388 February 2025

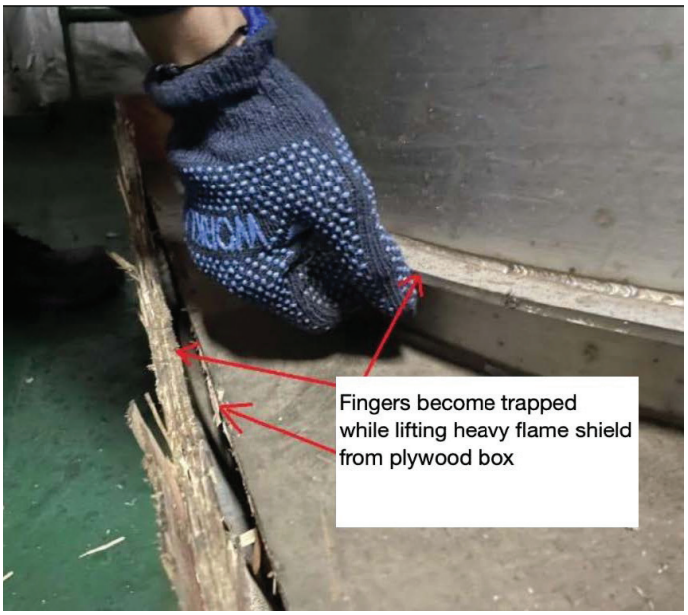
MARS 202505

Fingers crushed by heavy equipment

➔ An engineer and a helper needed to inspect the spare impeller blade assembly for the inert gas generator. This spare was kept in a plywood box, and was underneath a spare flame shield, which was quite heavy.

With no further planning, the crew attempted to lift the heavy flame shield off the impeller box by hand. Both crew were wearing cotton gloves for the task.

The plywood cover of the impeller box was only loosely installed. While shifting the flame shield, the loose plywood cover also moved, and one corner of the cover slid and fell inside the box. The flame shield was too heavy for the crew to support the weight, and the engineer's right index and middle finger were trapped between the flame shield and the wooden box. The victim received a deep cut on the index finger and a swollen middle finger.



Lessons learned

- Before carrying out any job, carry out an informal risk assessment which involves inspecting the job and the surrounding area. Ask yourself, what are the hazards?
- Whenever handling a heavy object, evaluate whether lifting appliances can be employed or alternate methods used to lift or handle the object. Use common sense before brute strength!
- Alternatively, if space constraints prevent the use of lifting appliances, it is crucial to ensure an adequate number of crew members are available for the task.
- Never put your hands below a heavy object or take a position which might lead to a crush injury.
- Use appropriate PPE. Debatably, leather gloves would have been more appropriate for this task and would have probably reduced the severity of the injuries. Yet, no injuries would have been sustained had the above lessons been applied prior to working.

MARS 202506

Tug capsizes with two fatalities

As edited from MAIB (UK) report 17/2024
https://assets.publishing.service.gov.uk/media/67333270f407dcf2b5613525/2024-17-Biter-HebrideanPrincess.pdf

➔ A small passenger vessel was approaching port after conducting post-refit sea trials and a pilot had embarked for the docking. The plan, as discussed between the Master and the pilot, was to turn the vessel 180 degrees and enter the confined dock area with the assistance of one tug forward and one aft, berthing the vessel starboard side to. The pilot took the con, and slow ahead on both engines was ordered. The Master inquired what speed was required for the aft tug to connect; the pilot responded that they could go up to 7kts and noted that slow ahead had just been ordered.

The passenger ship passed Number 1 Buoy and entered the main navigational channel at a speed of 6 knots. The pilot called the Master of the aft tug on VHF radio, directing them to approach and pass the tug's bridle to the aft mooring party on the passenger vessel. The pilot remained on the bridge, and the Master went to the starboard bridge wing to watch the tug make its approach. The aft tug matched the passenger vessel's speed, and the mooring party pulled the towlines on board.

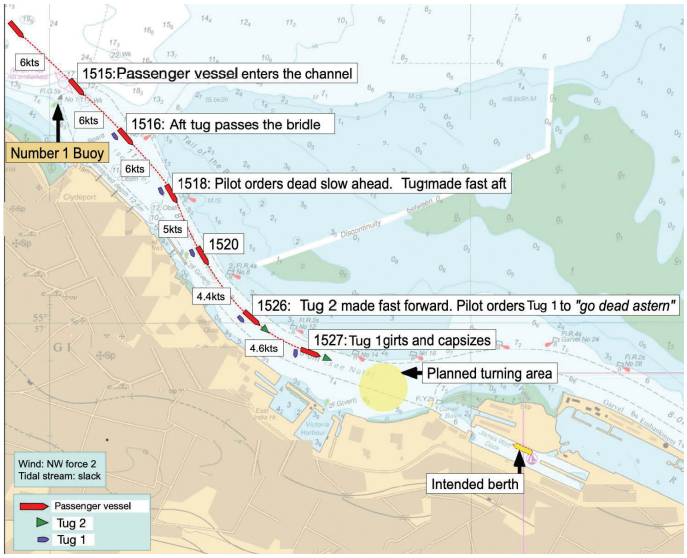
About three minutes later, dead slow ahead on both engines was ordered on the passenger vessel. Shortly afterwards, it was reported that the two lines of the aft tug's bridle had been made fast on the port and starboard side of the passenger vessel's poop deck. The forward tug began approaching for their connection. The passenger vessel was now making 4.6kts.

Once the forward tug was connected, the pilot directed 'After tug minimum dead astern' on VHF. The aft tug's Master responded, 'Do you want me swinging off pilot and go dead astern?', to which the pilot replied 'Yeah, dead astern minimum please'. Closed-circuit television images show the aft tug now turning to starboard and peeling away from the passenger vessel's starboard side then dropping astern.

On the aft tug's deck, the starboard bridle became taut. The tug's turn stalled with its heading now approximately 45 degrees to the right of the passenger vessel's track. The tug was quickly pulled sideways by the bridle and almost immediately heeled to port. It capsized within 10 seconds. Some of the aft mooring party on the passenger vessel threw lifebuoys overboard and looked for survivors, while one crew rushed to the galley for a knife to cut the tug's bridle.

The rescue efforts notwithstanding, the inverted tug sank within 30 minutes, taking the two crew with it. The victims were later recovered but were deceased.

The investigation found that, considering the speed (4.6kts), the tug had just over 10 seconds to reverse direction into its new position astern of the passenger vessel before its weight came onto the towlines. Instead, the tug's turn stalled and the bridle came under tension. The tug was using a gob rope, but this did not prevent the tug being towed sideways. The tug's emergency tow hook release was found to be operating correctly after the accident, but it is hypothesised that the crew did not have enough time to operate it before capsizing.



Lessons learned

- Research shows that the heeling force exerted on a tug is proportional to the square of the towing speed. As such, the heeling moment generated at 4.6kts was more than twice that generated at 3kts and five times that generated at 2kts.
- The passenger vessel's speed at the time of the manoeuvre exceeded the 2-3kts recommended by both industry and the local port towing guidelines.
- Investigations into similar girting accidents found that it was essential that conventional tugs use a gob rope during towing operations to ensure the safety of the tug. To be fully effective, this rope must be correctly set and secured. A gob rope must be as low in the vessel as possible and as close as possible to the tug's transom.
- The gob rope in this case was led through a bow shackle 2.8m behind the towing hook, about 0.5m above the deck and over 1m from the tug's transom. This gob rope arrangement was unlikely to be as effective as one rigged closer to the transom. It is therefore possible that this arrangement left the tug more vulnerable to being towed sideways and girted.
- It is essential for safe operations that the Master, pilot and tug Masters agree and share a common understanding of the planned manoeuvre. In this case there was ambiguity and lack of information amongst the team.
- Cutting the tug bridle may have changed the outcome had it been done before the tug capsized. As it was, a crewmember on the passenger vessel had to run to the galley for a knife.

MARS 202507

Ladder deficiency allows fall to quay

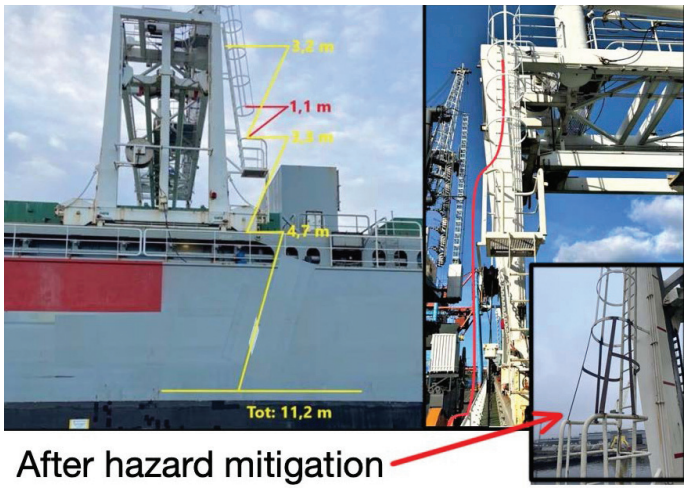
As edited from SKH (Sweden) report SHK 2024:16e https://shk.se/engelska/the-swedish-accident-investigation-authority/search-investigation/maritime-transport/2024-01-17-roerborg---fall-accident-in-oxelosund

➔ A general cargo ship was berthed to load steel products. The ship had a gantry crane which ran on rails on the coaming each side of the holds and was used to lift or replace the hatch covers.

A crew member was climbing down from the gantry crane control area to the deck. While proceeding down the ladder, the crew member lost their footing on one of the upper rungs. They initially fell to a platform on the lower part of the gantry crane, but the momentum from the initial fall carried them over the platform railing and then down over the ship's side railing before finally landing on the quay.

The ladder in question was equipped with a protective cage and the platform under the ladder was equipped with a railing. Between the platform railing and the ladder's protective cage there was an unprotected space measuring just over 1m. The crew member fell through this space and down onto the quay. The total height of the fall was just over 11m.

Other crew members saw the fall and rushed to the quay to administer first aid and call for external assistance. An ambulance soon arrived and took the victim to a local hospital. The crew member was seriously injured by the fall, but did not suffer permanent injuries. At the time of the accident the victim was wearing several layers of clothing and a helmet with a chinstrap. The clothing and the personal protective equipment probably mitigated the consequences.



Lessons learned

- This accident again illustrates the benefit of doing the rounds of your vessel with 'new eyes'. Try and see where hazards exist but have always been in plain sight. We become too accustomed to hazards in plain sight; we see them as 'normal'.
- The victim had used a protective helmet with chin strap. The chin strap, an often-maligned PPE detail, was instrumental in keeping the helmet on their head during the multiple impacts of the fall and may have saved their life.

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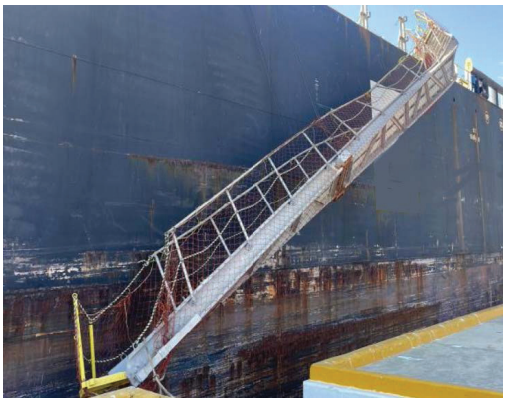
MARS 202508

Damage to accommodation ladder

➔ A tanker had arrived at berth to load a fuel parcel. Once mooring was completed, the starboard accommodation ladder was prepared for the embarkation of local authorities, including the agent and the terminal personnel. Upon embarkation of the first group of terminal workers, they requested that the vessel lower the ladder somewhat to reduce the gap from the dock. The ladder was subsequently lowered, but now was below the level of the jetty.

As the vessel was moving somewhat, both vertically (15 cm) and horizontally (30 cm), the ladder hit the dock and suffered damage before it could be raised above the level of the jetty.



Lessons learned

- Consider your actions before executing them – bad consequences are a possibility so be situationally aware.
- Sometimes we rush to please others. Stay focused on safety.

MARS 202509

Progressive flooding sinks tanker

As edited from KMST (South Korea) report MSI 2024-003 https://www.kmst.go.kr/eng/board.do?

➔ A fully loaded tanker left port despite a bad weather forecast for the following days. As a precaution, the Master chose a route relatively close to the coast in the event of an emergency.

Some 11 hours after departure, the bilge alarm sounded in the bow thruster room. The OOW considered it to be a malfunction and silenced the alarm. The next morning the bilge alarm in the bow thruster room sounded again. The bilge pump was started for that space, and the alarm soon ceased.

The weather remained relatively fair during the first day of the voyage. By the afternoon of the second day, a strong northeasterly wind was blowing, with waves increasing from four to six metres. In the afternoon of the same day, a 440V low insulation warning alarm was detected in the windlass motor room.

Given the alarms, the Master wanted to check the extent of the problems forward. He altered the tanker's course to reduce wave impacts at the bow. Crewmembers, including the chief engineer, then went forward and found that there was about one metre of water inside the windlass motor room. The windlass motor room was emptied of seawater using the general service pump and portable air pumps, but the operation was hampered by the ship's heaving and rolling. The Master checked the cargo stowage programme on the vessel's loading computer (Loadcom) to determine the tanker's safety and seaworthiness in the event of a flooded windlass motor room. The result appeared good, so he decided to continue sailing to the destination port. The next morning, the Master again turned the vessel away from the wind to permit a check in the windlass motor room. There was once again water in the compartment, and the level had reached the top of the entrance stairway. Pumps were employed for about two hours, but were not able to lower the water level.

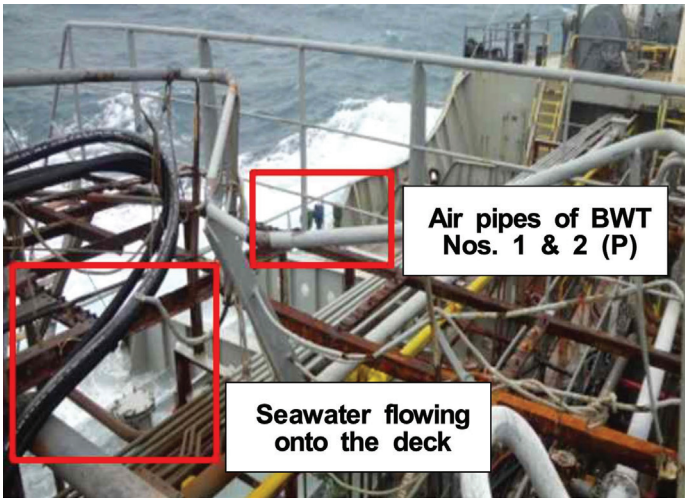
Given the weather forecast and his sailing experience in the area, the Master determined that the weather would improve so he resumed sailing toward the destination port. Later that day the vessel heeled a few degrees to port. Some hours later, the vessel was heeling five to seven degrees to port. It was later posited that port side ballast tanks one and two were taking water due to damaged air pipes caused by the continuous blue water on deck.

To correct the heeling, ballast water was loaded into the ballast water tank on the starboard side, but this did not bring the vessel upright. The vessel was now dangerously overloaded and lacked sufficient reserve buoyancy. The Master then attempted to alter the tanker's course over a three-hour period with varying success. With the tanker now heeled to port and with negative trim, and given the wind and waves, the manoeuvres did not have the desired effect.

Finally, at 2:40 the following morning, it was decided to abandon ship. A distress signal was sent and a rescue helicopter arrived on scene about 2.5 hours later. Other rescue resources followed, and all crew were recovered. The tanker capsized and sank about six hours later. All crewmembers were rescued, but the chief officer died while being transported to hospital.

The investigation determined from witness testimony and the salvaged vessel, among other things, that the sequence of flooding was as follows: as the weather conditions worsened seawater constantly washed over the forecastle. The seawater inundating the forecastle deck flowed into the chain locker through the spurling pipe, which was not plugged. When the chain locker was full, it flowed through the opened chain locker hatch into the motor room and from there through the open door into the bow thruster room.

Additionally, the investigation found that the three flooded areas (windlass motor room, the bow thruster room, and the chain locker) are excluded from the vessel's Loadcom program. The simulation conducted by the Master earlier in the voyage to determine the vessel's seaworthiness was mistaken and gave a false sense of security.



Lessons learned

- It is best practice to plug spurling pipes prior to bad weather and keep chain locker access hatches closed and dogged.
- Ensure your vessel is 100% seaworthy – battened down doors and hatches for all seas.
- Know your ship and the tools available to you, among others the load computer.

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