



Mariners' Alerting and Reporting Scheme

MARS Report No. 317 March 2019

MARS 201915

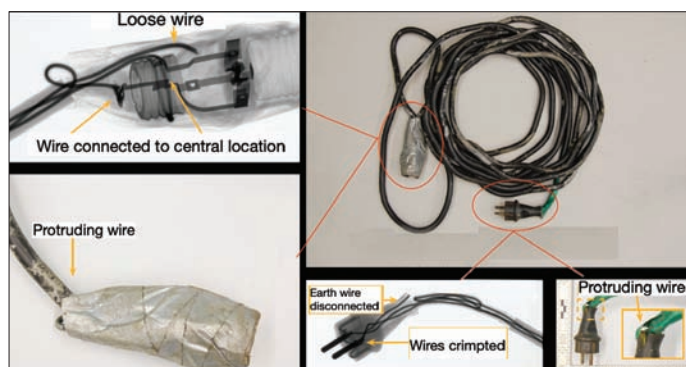
Jury-rigged extension cord proves fatal

As edited from Dutch Safety Board official report published August 2017

➔ The crew were carrying out maintenance work on the vessel while at anchor. One of the jobs was to paint the bilge water retention tank in the engine room. The tank was opened, ventilated and the atmosphere tested, in line with procedure. The bosun worked in the tank while the apprentice assisted outside the tank, mixing paint and passing down material. The bosun used torches and rechargeable lamps to provide light within the tank.

Work was stopped for coffee. When they returned to the tank, the bosun was carrying cable that had a lamp fixed to one end and a plug on the other. Tape was wrapped around both the lamp's fitting end and the plug end. The bosun inserted the plug in a wall socket near the tank and took the lamp into the tank.

At one point the apprentice wanted to hand the bosun some more mixed paint, but the bosun did not reply to his questions. When the apprentice looked into the tank, illuminating it with a torch, he saw the bosun was lying unconscious at the bottom of the tank. The alarm was raised and a rescue was initiated with the help of breathing apparatus. Resuscitation was started and continued while the victim was evacuated ashore, but he was pronounced dead at the hospital.



The report found that the victim probably died as a result of electrocution from direct contact with the live wire as a result of the opening in the cable covering, although other causes could not be ruled out entirely.

Lessons learned

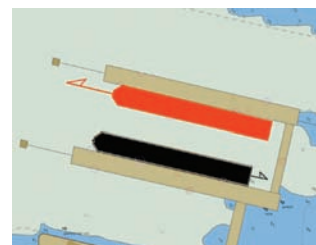
- Inadequate supervision, as in this case, can have disastrous consequences.
- Under no circumstances should electrical cords be improvised, repaired or otherwise jury-rigged. Only undamaged, intact cords that are manufactured for such use should be employed. Better yet, use battery-powered lighting in confined spaces.
- Never underestimate the deadly power of ship's main electrical power.

MARS 201916

Hydrodynamic interaction close-call

➔ A cruise ship (CS Orange in the diagram) was moored starboard side to, bow out. Another cruise ship (CS Black) turned on arrival and was backing into its berth, going port side to. While CS Black was nearing its final position, the bridge officer on the starboard wing reported that CS Orange had begun to let go lines and was departing, yet the bridge team of CS Orange had not announced their intention to depart the berth on VHF 16 or the port working frequency. Several of CS Black's lines were now ashore when CS Orange departed its berth and rapidly increased its speed.

The speed of CS Orange was close to 5 knots as its stern passed the bridge wing of CS Black. With a lateral distance of only 30 metres between the vessels, CS Black began to surge ahead. The relatively small under-keel clearance probably magnified the interaction effects. Thankfully, since the bridge team of CS Black were aware of the potential risk of hydrodynamic interaction, no strain had been taken on the spring lines until CS Orange was well clear.



Lessons learned

- The surging of CS Black during mooring could have caused the spring line to part had it been secured, which in turn could have caused serious injury or even death.
 - During a mooring operation, it is important to maintain broad situational awareness. One cannot always count on the bridge teams of nearby vessels to exercise good and safe seamanship.
- **Editor's note:** For more hydrodynamic interactions see MARS 201703 and 201704 among others.

MARS 201917

Electrical mismatch causes grounding

As edited from Canadian TSB report M17C0205

➔ A chemical product carrier was bound upriver and had just exited a lock when the bridge team reported a bow thruster alarm and shutdown. After some difficulty the breaker was reset; the bow thruster came back online and control was restored to the bridge.

Shortly afterwards, the vessel entered another lock. Once through the lock, the bridge team increased speed to approximately 5 knots. The Master shut off the bow thruster but observed a brief fluctuation in the bow thruster's load indicator. The Master restarted the bow thruster in order to verify his observation. At the same moment, the crew standing by on the fo'c'sle heard a loud noise, and the crew in the engine room experienced local vibrations.

The vessel lost all electrical power, and the main engine, bow thruster, and steering gear shut down. The vessel continued to move forward under its own momentum, swinging slowly to port. Shortly thereafter, the emergency generator automatically activated and electricity was

restored to the vessel's essential safety components, including the steering gear.

On Master's orders, the crew standing by on the fo'c'sle let go the starboard anchor with the intention of reducing the vessel's speed and the swing to port. The rudder was put hard to starboard, and the port anchor was also let go, but the vessel continued to swing to port. A little later, the vessel made contact with the breakwater on the south side of the canal and subsequently ran aground. The vessel's speed at the time of the grounding was estimated at about 5 knots.

The investigation identified the following unsafe conditions that rendered the vessel vulnerable to a total loss of power:

- The bow thruster's local circuit breaker trip and time delay settings were higher than the manufacturer's recommended settings.
- The main circuit breakers for the vessel's three auxiliary generators were set to the manufacturer's recommended trip and time delay settings, which were lower than the bow thruster's local circuit breaker settings, making them unable to accept the higher load.
- The power management system was in harbour mode, which did not provide the vessel with optimum electrical efficiency and protection.

Lessons learned

- The manufacturer's recommended settings are usually safer than individual settings.
- An incorrect setting on one machine could have negative repercussions on another related machine and even for the entire vessel.

MARS 201918

Shocking end to a crewman's contract

➔ An engine room crew member was investigating problems with the fuel oil circulating pump at the circuit breaker board. The pump's breaker was opened and he proceeded to check the isolation status of the breaker terminals with a multimeter. As soon as he touched the terminals with multimeter leads, a huge spark emanated from the breaker/multimeter, with a loud explosive sound and black smoke.

The victim sustained burns on his face, neck and hands due to radiant heat. He was given first aid and signed off from the vessel for further medical attention ashore. The investigation found that he had attempted to check the voltage across breaker terminals with the multimeter selector knob at the Resistance (1 Ohm) setting instead of the Voltage (1000VAC) setting. The electric charge found its shortest path (through the multimeter), which then exploded. It was also found that the victim had failed to use insulating gloves which would have decreased the severity of the injury.



Lessons learned

- Approved insulated gloves should be used while working on electrical components.
- It is always a good idea to cross-verify your tool and workplace before starting the job;
 - Is the guard in place?
 - Is the setting correct?
 - Is the electrical supply safe?
 - Is the lighting adequate?

MARS 201919

Enclosed space fatality

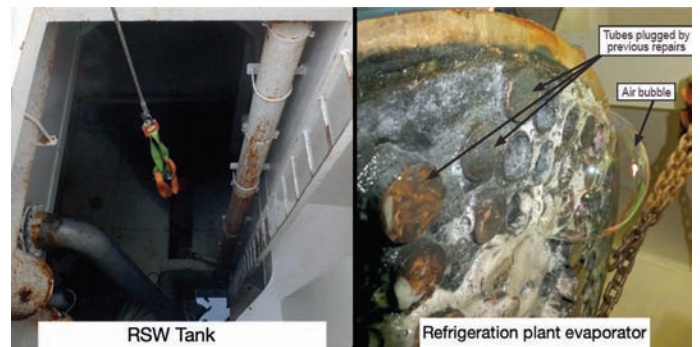
As edited from the UK MAIB Safety Bulletin SB4/2018

➔ A medium-sized fishing trawler was in port. Having landed its seasonal quota of herring the crew were preparing for a planned refit period. One item on the refit list was to replace the vessel's refrigeration plant, which serviced the nine refrigerated salt water (RSW) tanks on board.

The vessel's refrigeration plant had been shut down. Its RSW tanks had been pumped out and the tank lids opened in preparation for deep cleaning. The vessel's second engineer entered one of the RSW tanks alone, without advising anyone or testing the tank atmosphere. Some time later, he was seen lying unconscious at the aft end of the tank by a crewmate, who immediately raised the alarm. Three crew entered the tank and tried to resuscitate the victim but they soon became dizzy, confused and short of breath. One of them managed to climb out of the tank unaided; the other two and the victim were recovered on to the open deck by crew wearing breathing apparatus. The two crewmen made a full recovery, but the second engineer could not be resuscitated and died.

Following the accident, tests of the atmosphere in the tank showed that the level of oxygen at the bottom was less than 6% (normal level = 20.9%). Further tests indicated the presence of Freon R22, the refrigerant gas used in the RSW tank's refrigeration plant.

The official investigation found that the refrigeration plant evaporators had suffered several tube failures necessitating a number of repairs. It is likely that Freon leaked through one or more failed tubes into the seawater system and was released into the RSW tank. Freon R22 is four times heavier than air so it will displace oxygen at the bottom of an enclosed space. It is a toxic, tasteless and mostly odourless gas. If it is deeply inhaled, it can cut off vital oxygen to blood cells and lungs.



Widely recognised safety controls for working in enclosed spaces include:

- Atmosphere testing before and during entry.
- Provision of positive ventilation.
- Safety sentry at entry point while persons are in the space.
- Breathing apparatus available for rescue team.
- Safety harness and means of recovering an unconscious person at hand.

Lessons learned

- All enclosed spaces on a vessel should be identified.
- Entry into any enclosed space should be regulated by a procedure that includes ventilation of the space and testing of the air prior to entry. Additionally, the procedure should include close and continuous supervision by a qualified crew member (safety sentry) at the entrance to the space while it is occupied.
- If an emergency occurs in an enclosed space, entry should only be attempted by crew members wearing breathing apparatus.

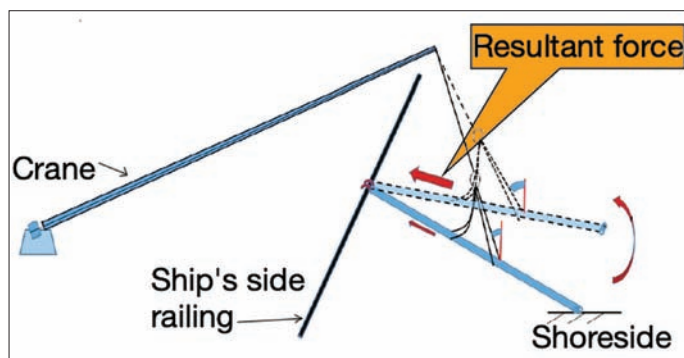
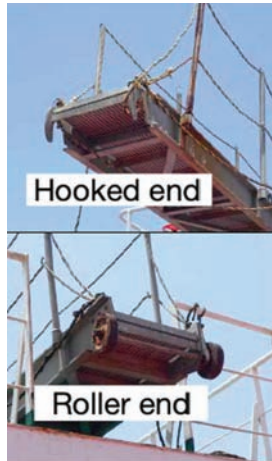
MARS 201920

Internal bleeding ends in fatality three days later

As edited from official Hong Kong SAR report issued on 11 September 2018

→ A portable gangway was arranged between the main deck and the terminal with the hooked end of the gangway on the ship's side and the roller end on shore. Once the cargo was loaded the deck crew began securing the portable gangway for departure. In order to pick up the gangway, the deck ratings were split into four groups. The gangway was lifted by the hose handling crane, and each group handled a guide rope attached to one of the four corners of the gangway to stabilise it once it was in the air.

Tension was brought on the lift but the hooked end remained stuck on the vessel's railing. As the chief officer moved closer to examine the problem, the hooks suddenly released from the railing. Because the crane's hook, attached to the gangway sling, was not under the head of the boom, the gangway shifted inboard in an uncontrolled manner. It struck the chief officer, pushing him up against a nearby water ballast tank vent-head.



After the accident, the Master conducted a visual inspection of the chief officer's abdomen and instructed him to take a rest. The vessel departed on schedule. The victim visited a local hospital at the next port of call and scans showed internal bleeding in his abdomen. Against doctor's advice, the victim refused to stay in the hospital for further observation and treatment. He received some pain relief pills and returned to the vessel in the early morning of the next day.

That same day, the vessel was loading cargo at the terminal and the chief officer did not take his watch for cargo loading, instead staying in bed due to abdominal pains. Ice bags were placed on his abdomen to ease his pain but the next day, the victim felt weak and in the afternoon his body was becoming cold. An ambulance was called but by the time the paramedics arrived the chief officer was declared deceased.

Lessons learned

- Almost three days passed between the accident and the death of the chief officer. Internal bleeding is a serious injury, but its consequences can take time to become apparent.
- Even seemingly minor accidents can have serious consequences. Always have injuries attended to and pay special attention to possible internal injuries.

- Decisions as to fitness for duty after an injury should not be left exclusively to the victim. Company procedures should give guidance to Masters and crew on actions subsequent to diagnosis.
- Every lift should be carefully undertaken with regard to keeping the boom-head directly over the hook.

MARS 201921

Pressure washer injures two crew

→ After the daily toolbox meeting, the deck crew began scaling operations using a pressure washer. Each crew member was dressed in the required PPE to carry out this task: helmet, full-face mask, dust mask, overalls, gloves and boots. As they were working, the high-pressure water hose suffered a sudden leak near the two crew. The surprise and the force of the pressurised water leak caused the crew to lose control of the hose and they suffered impact from the backlash of the uncontrolled hose.

Their minor injuries were treated by first aid.



Lessons learned

- Close inspection of powered or pressurised equipment before use should be a best practice on all vessels.
- In this case, the crew's PPU probably reduced the severity of their injuries considerably.

MARS 201922

Grease bucket lands on head

→ Crew members were assigned to grease the crane hoist wire. Two crew went up the crane post to make the necessary preparations while another made fast the 5-litre grease bucket to a heaving line. When ready, the bucket was heaved up manually by one of the crew aloft. While raising the bucket, the heaving line parted and the grease bucket fell, hitting the crew member's head on its way down.



Luckily the victim was wearing a safety helmet, but he nonetheless suffered severe neck and head pain and was later signed off for further medical attention ashore.

Lessons learned

- Never place yourself under a lift, no matter how small. Small objects falling from height can still be dangerous. (See MARS 201835 for an interesting chart of weight dropped/height versus consequences.)
- Using heaving lines to lift small loads may be a common practice, but it is not entirely appropriate. A dedicated 'light-load' line with a known SWL and in good condition should be used in order to reduce risks, as in this accident.

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