



Mariners' Alerting and Reporting Scheme

MARS Report No 348 October 2021

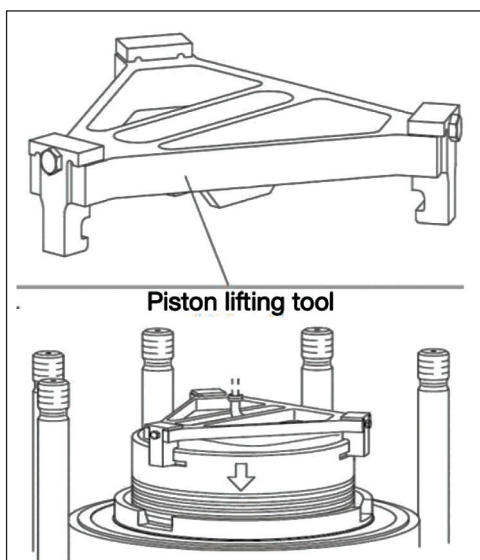
MARS 202148

Engine crewmember dies during piston replacement

As edited from the Bahamas Maritime Authority report for 8 February 2020

→ While at anchor, the engine crew were overhauling a main engine piston. The removal of the piston and stuffing box and the overhaul of the piston were completed without incident.

The task had been started in the morning, and in the late afternoon, the crew commenced the re-installation process. This last but critical phase of the overhaul would take about an hour, and included using the piston lifting tool. The lifting tool has two stationary claws and one adjustable claw. The claws sit in the piston lifting grooves on the top of the piston.

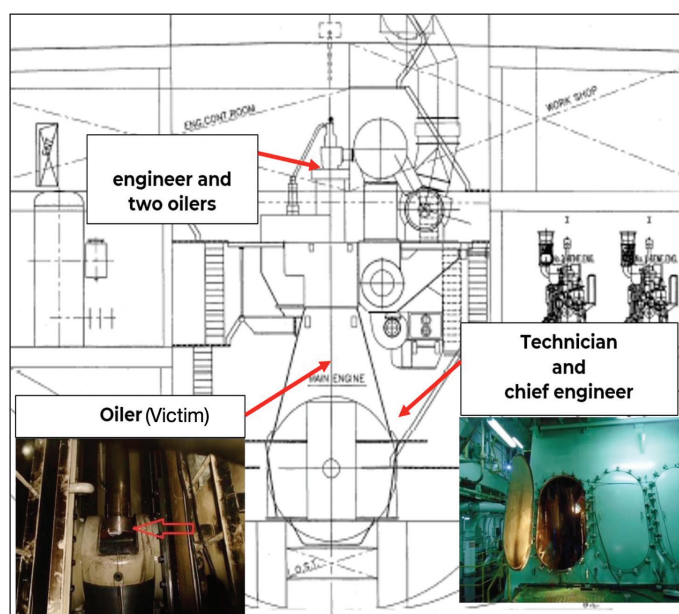


An engineer was in charge of lowering the piston using the engine room crane. He was stationed at the upper platform near the cylinder head, along with two assisting oilers. Another engineer was in charge of placing the stuffing box into position, and was inside the crankcase along with the technician and another oiler. The chief engineer was standing outside the crankcase at the lower platform supervising the entire operation.

The two engineers engaged in the work each had a portable VHF radio and they communicated to each other in a language not understood by the chief engineer. Although he was supervising the operation, he himself did not have a VHF radio.

It took about an hour to stow the stuffing box. Once it was tightened in position, the chief engineer instructed the crew to clear all the tools, clean the surfaces and exit the crankcase. Both the engineer and the technician exited the crankcase but the oiler remained inside to clean up the area.

Soon after, the chief engineer instructed an engineer to turn the engine using the turning gear. The other engineer dropped the piston lifting tool. A loud noise was heard; the piston had dropped inside the crankcase. The oiler who had remained inside the crankcase was found unresponsive in the sump tank of the main engine. Emergency procedures were taken but the oiler was declared deceased before his arrival at the hospital.



The investigation subsequently found, among other things, that:

- The existing risk assessment for this job indicated that crew should take the engine manufacturer's instruction manual into account while planning the operation. However, in this case the manual was not discussed beforehand and several steps mentioned by the manufacturer were not followed by the crew members during the operation.
- The chief engineer was the supervisor of the operation. However, he did not have a portable VHF radio with him while the task was being carried out. Furthermore, the communication between the two other engineers was in a language not understood by the chief engineer.

Lessons learned

- Before carrying out any high-risk operation, such as overhauling and maintenance of the main engine, the manufacturer's instructions must be discussed and incorporated in the planning of the operation.
- A thorough review of the risk assessments for any high-risk operation must be carried out to identify the hazards and risks associated with every stage of the operation. Appropriate safeguards to eliminate those risks should be put in place.
- Effective communication should be established while carrying out any operation onboard. The supervisor of the operation and all involved crew members should be equipped with the appropriate communication devices and communicate in the vessel's working language throughout the operation.

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MARS 202149

Boiler accident causes severe burns

➔ While in dry dock, a junior engineer new to the vessel was tasked to prepare the boiler for a survey to take place the next day. He began the job in the morning, shutting down the boiler by first stopping the circulating pumps and, after about an hour, opening the vent valve to continue the depressurising process. The boiler at that time was at 2.5 bar.

For the rest of the day, the engineer was busy with other jobs. At 1700, he returned to the next steps in the boiler shut down process. In order to drain the boiler, he first opened the two blown-down valves and the two overboard valves.

The feedwater pumps were started about 25 minutes later to empty the hot well and stopped again after about 20 minutes. The water level was monitored through the water level indicator. The junior engineer then noticed that the water level was no longer decreasing, even though the vent valve was fully open. The pressure indicator indicated 0 bar.

Assuming it was safe, he then decided to remove the upper section of the maintenance hole, followed by the lower part. Suddenly, a mix of water and steam came out of the orifice and hit his body. The victim was admitted to the shore hospital with first and second degree burns on his legs, arms, belly and feet.



The company investigation revealed, among other things, that the boiler indicator habitually did not go lower than a certain level, a quirk that could give an uninitiated crewmember the impression it was empty when it was not. This vital information is not mentioned in the boiler manual and was only known by the more experienced engineers on board, not the victim. Additionally, the company found that the job scope had not been properly communicated to the victim and no permit to work was issued to carry out the job on the boiler that day. Finally, no Lock-out/Tag-out (LOTO) was applied.

Lessons learnt

- The supervision of junior employees remains a vital element of safety, especially for non-routine tasks and particularly when it is the first time the person is attempting that task.
- Remember – the large skill and experience gap between senior and junior officers may lead to misunderstandings and assumptions.

MARS 202150

Welding job ignites nearby combustible, causing injury

➔ An engine room crewmember was tasked with repairing a metal safety box. He set up his welding equipment in the workshop and began to weld the box. As he was working, a hot spark from the arc

welding process came into contact with a small can of spray lubricant. The spark punctured the pressurised can, immediately generating a flame burst that injured the crewmember.

The victim was able to leave the workshop on his own and seek help. The victim had burns on his hands, neck and face. First aid was given, but due to the severity of the injuries he was evacuated to a shore hospital via a local Coast Guard patrol boat.



Hole where welding spark initiated a flame burst

Lessons learned

- Welding is a dangerous business and the job site should be clear of all combustibles, debris and other non-essential items.
- Complacency is often a contributing factor in accidents. We must encourage an approach where each task is approached with caution – as if it were the first time it was being undertaken.
- Supervision and safety leadership are critical. Where improper routines or unsafe practices are noted, intervene and arrange for appropriate instruction and/or training.

MARS 202151

Collision in fog

As edited from official DMAIB (Denmark) report published 9 April 2021

➔ A refrigerated general cargo vessel was underway in a coastal area. When the visibility decreased to less than one nautical mile, the speed was reduced to 14 knots and steering was undertaken manually by a helmsman, with the Master and OOW also on the bridge. Half an hour later, the Master and OOW noticed a vessel on the radar which was not transmitting an AIS signal. As the vessel crossed ahead from starboard at a distance of approximately one nautical mile they noticed that it was a naval vessel. The Master observed it visually from the windows on the port side while trying to assess the visibility. The visibility then decreased to about 50 metres.

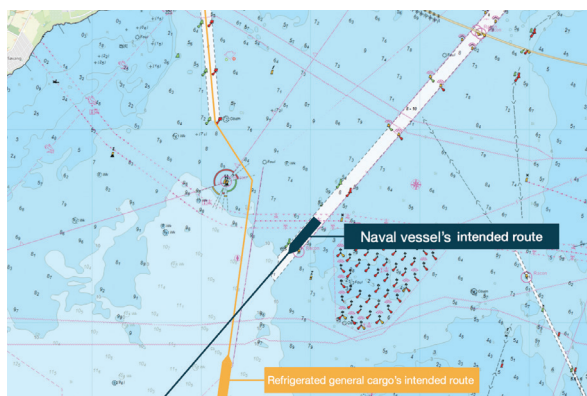
The OOW now observed another vessel on the radar approaching from starboard. He voiced his observation, and the Master went back to the radar. This vessel, like the previous one, was also not transmitting an AIS signal and the OOW plotted it on the radar. It quickly became apparent to the bridge team that their vessel and the target vessel were on a collision course.

The Master knew he needed to take action, but did not want to turn hard to starboard because he was concerned they would collide with the approaching vessel. Additionally, the vessel had a draught of 7.1 m, and the 10m depth contour was only 0.3-0.5 nm to starboard.

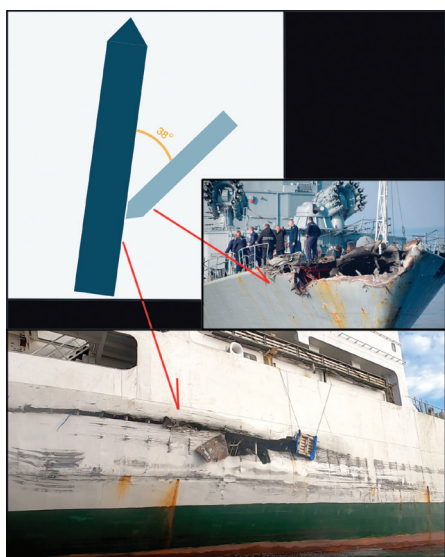
On the other hand, he did not want to turn to port because that would not resolve the situation in the event that the other vessel altered course to starboard. The Master gave orders to activate the sound signal. The visibility was now close to zero and the approaching vessel was

still not visible. Unsure of the other vessel's course and intentions, the Master decided to attempt to increase the CPA by ordering a course change a few degrees to starboard. The other vessel did not change its course, and the small course alteration did not have any effect. He then told the helmsman to alter the course a few degrees to port.

Shortly afterward, the other vessel appeared abeam and slammed into their starboard side. The Master and OOW saw that this was another naval vessel similar to the one that had passed ahead a few minutes earlier.



Shortly after the collision, the cargo vessel dropped anchor to better assess the situation. The damage incurred was above the waterline and there was no risk of pollution. In the meantime, the naval vessel was adrift and was assisted by the other naval vessel which had returned to the area.



The official investigation found, among other things, that several coinciding factors contributed to the bridge team not recognising the risk of collision until the naval vessel was at close quarters. These included the layout of the bridge, the configuration of the X-band radar and the division of work between the Master and OOW. The investigation was not able to determine the sequence of events on the naval vessel.

Lessons learned

- In this instance, the bridge teams of both vessels made the classic mistake of not sufficiently reducing speed to give more time to assess the situation and/or increase the CPA. In any event, given the restricted waterway no other manoeuvre was even possible in this situation.
- In restricted visibility the rules of the road are clear. Rule 19 applies, stating: Every vessel which cannot avoid a close-quarters situation with another vessel forward of the beam, shall reduce speed to minimum steerage. If necessary take all way off and in any event navigate with extreme caution until danger of collision is over.

MARS 202152

STS transfer ends with a touch of bows

➔ A tanker was anchored with nine port shackles in the water, awaiting the arrival of the receiving vessel to carry out a STS transfer operation. The compatibility of the vessels for STS operations had been confirmed by the STS organiser and a pre-transfer information exchange between the two vessels had been done. Fenders were rigged at the starboard side to accommodate the receiving vessel. The receiving vessel berthed without incident and the STS transfer was completed over approximately 12 hours. Unmooring then commenced under the supervision of the STS supervisor, who was on board the receiving vessel.

The STS supervisor first requested the discharging vessel to heave up five shackles and remain anchored with four shackles in the water. Unmooring then commenced. Within 10 minutes the receiving vessel started moving away from discharging vessel using her bow thruster and main engine. When the distance between the vessels was about 15-20 metres, the STS supervisor thought that the bow thruster of the receiving vessel was sucking a fender rope, so he stopped the thruster. Within seconds, the prevailing current caused the bow of the receiving vessel to drift towards the discharging vessel. The two vessels came into slight contact.

The unmooring manoeuvre was suspended and the discharging vessel was instructed by the STS supervisor to heave up her anchor fully. Once the anchor was retrieved, the unmooring operation was resumed underway and the vessels successfully separated. Except for paint scratches, no damage or deformation to vessel's side shell was observed.



Lessons learned

- Weather conditions were optimum, and as such the unmooring operation could have been carried out safely with both vessels underway – which is how it was accomplished after the incident. A well-coordinated STS unmooring while underway gives more 'leverage' over external forces such as current.
- Fenders may be secured on either vessel, but contacting an unprotected portion of the hull is less likely if the fenders are rigged on the manoeuvring ship.

■ **Editor's note:** STS best practices from the pages of the Skuld website (<https://www.skuld.com/topics/cargo/liquid-bulk/ship-to-ship-transfer-safety/>)

The most common incident during STS operations is contact/collision between the two ships while manoeuvring alongside each other, or upon departing. There are many reasons for this, including:

- Incorrect approach angle between the manoeuvring vessel and constant heading (mother) ship;
- The manoeuvring ship approaching at excessive speed;
- Failure of one or both ships to appreciate meteorological and/or tidal conditions;
- If underway; the mother vessel not maintaining a constant heading and speed;
- If at anchor; the mother vessel failing to control excessive swinging and/or the manoeuvring ship failing to appreciate the swing;
- Miscommunication between the vessels during manoeuvring.
- Bridge wing to bridge wing touch for ships of similar length.

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