Mariners' Alerting and Reporting Scheme

MARS Report No 346 August 2021

MARS 202137

Fingers burned – no LOTO

➔ Two engine room crew were attending to the main engine fuel backwash filter alarm. They suspected the problem was a clogged pipe or air trapped in the line to the differential pressure cell. As one crew slackened the copper pipe ferule connection to purge the line, the pipe came free, releasing hot fuel on his hands. The victim was wearing cotton gloves, which became soaked with hot oil. It was later observed that the skin on his thumb was peeling off and blisters had developed. First aid was administered and he was sent to a shore facility at the next port for followup medical care.

The company investigation found, among things, that the system being worked on had not been isolated and vented to release the pressure.

Lessons learned

- Proper isolation and lockout ('lockout/tagout', LOTO) must be completed before carrying out maintenance on any equipment. Ask yourself 'Is there any potential energy in this system?'
- Work permits, properly completed before the task begins, are the basis for safe and successful outcomes.
- Cotton gloves are not the best protection against work injuries.

MARS 202138

Hydrodynamic effects amplify with speed

As edited from NTSB (USA) report MAR 2101

➔ A loaded LPG carrier was under pilotage in a restricted waterway, outbound for the sea. It had met several inbound vessels without incident, and the pilot requested full sea speed. As the vessel's speed increased and approached 12 knots, another vessel was approaching inbound. The pilots had agreed to a port-to-port encounter. As the two vessels met, several helm orders were needed to control the LPG vessel's trajectory.

The LPG carrier was nonetheless shifted to starboard, close to the waterway bank. At this point, hydrodynamic forces came into play. The vessel was by now making 12.6 knots, swinging to port and crossing the channel directly towards an inbound tug pushing two barges side by side. Both barges were fully laden with a gasoline blending stock.

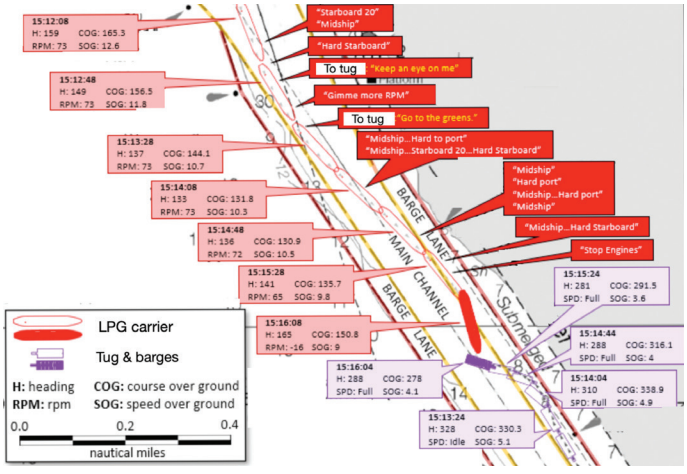
The tow was making about 5.3 knots speed over ground and was about 0.7nm from the LPG carrier.

The pilot on the LPG carrier ordered hard starboard rudder, then called the tug on VHF radio. The LPG carrier's bow was now pointing directly at the tug and its barges. The pilot realised the LPG vessel was not going to make it back to the starboard side of the channel, so he requested the tug Master to 'Go to the greens', meaning the tug and barges should cross the channel so the vessels would then pass starboard to starboard.

The tug Master complied and gave full port rudder, but within minutes the LPG vessel's bow struck one of the barges midship on the starboard side, penetrating the double hull and breaching two cargo tanks in that barge. The force of the collision capsized the second barge although no tanks were breached.

No crew on either vessel were injured, but nearly two million litres of gasoline blending stock were lost into the waterway. The two barges, with a combined insured value of $2,789,643, were later determined to be constructive total losses and scrapped.

The official investigation found, among other things, that the combined effect of the speed of the LPG vessel passing another large vessel in the asymmetrically shaped channel resulted in an uncontrollable sheer to port by the LPG vessel, initiating the chain of events that led to the collision.



Lessons learned

- Research on hydrodynamic interaction indicates that if the speed of the ship near a bank is too high, the rudder may be less able to cope with the forces induced and control will be lost.
- Proceeding at full sea speed in a restricted channel not only increases the risks of an uncontrolled shear due to hydrodynamic effects, but leaves the mariner with few options to mitigate or control the situation.

■ **Editor's note:** Unwanted hydrodynamic effects on ships navigating narrow channels often catch ship operators by surprise. MARS has several instances of these types of incidents; usually, too much speed has contributed to the unwanted outcome. For a few examples, see MARS reports 201703, 201704 and 201830. The official Transportation Safety Board of Canada report on which MARS 201704 is based is a good example of how this phenomenon can take mariners by surprise. It can be accessed here: https://www.bst-tsb.gc.ca/eng/rapports-reports/marine/2005/m05l0205/m05l0205.pdf

MARS 202139

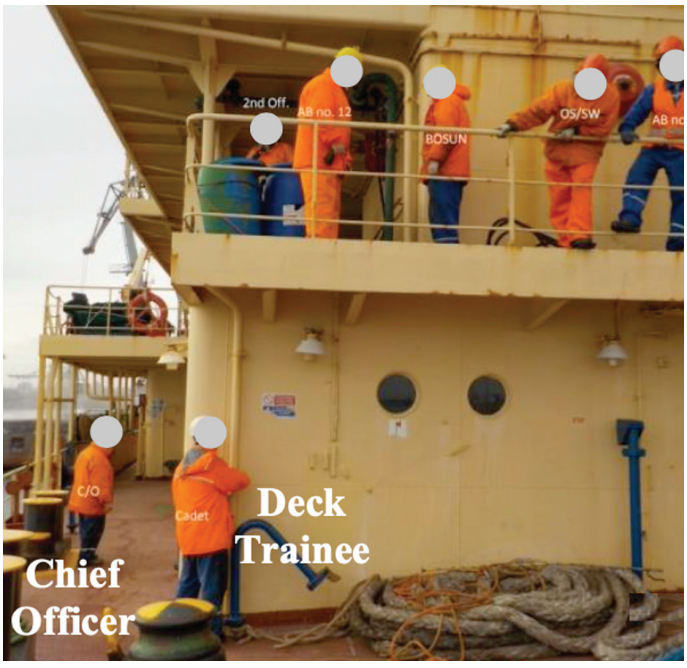
Two crew overboard in heavy weather

As edited from the Marine Safety Investigation Unit (Malta) report 01/2021

➔ A bulk carrier, loaded to maximum draught, was underway with the main engine running on half ahead. In calm weather, a half ahead engine on this vessel would give a speed of about 9 knots, but due to the very unfavourable weather conditions, the vessel's speed was about 3 knots.

Some loose mooring ropes were observed on the poop deck, with some dangling over the vessel's guard rails. The OOW and the Master were made aware of the situation and the chief officer proceeded to the poop deck with the bosun to assess the situation.

Once on deck, they attempted to lift the ropes from the poop deck to deck 1. This proved too difficult. The ropes were heavy and most of them were entangled with other mooring ropes. The chief officer proceeded to the poop deck in order to attempt the task. He managed to retrieve one of the mooring ropes and then proceeded to untangle another but this again proved too strenuous, so he asked for help on the poop deck.



Simulation of the event

Three more deck crew arrived on deck 1 to assist. Some ropes were brought on board and untangled, with some crew working on deck 1 and the chief officer and a trainee on the poop deck. Suddenly, a large wave washed over the poop deck from starboard. Within seconds of the first wave, a second larger wave washed on board from the same direction. The two crew on the poop deck were swept overboard.

Due to the vessel's low speed and the inclement weather conditions, it took over 20 minutes for the vessel to turn on a reciprocal course and to proceed towards the man overboard position. Six lifebuoys were released, including the two from the bridge wings. The liferaft embarkation ladder was rigged on the vessel's side and crew members were posted as lookouts at several high points on the vessel.

The local coastguard deployed two search and rescue helicopters to assist in the search. The helicopters were able to identify two of the lifebuoys that were thrown by the vessel's crew; however, there was no sign of the two victims. By night time, the search and rescue operation was terminated by the coastguard. The ship remained on location until noon the following day without finding any survivors.

The official investigation found, among other things, that neither victim was secured to the vessel with a lifeline when the waves washed over the poop deck. Additionally, the crew members were not wearing lifejackets while working on the exposed deck in adverse weather conditions.

Lessons learned

- Hindsight is always 20-20, but most vessels loaded to maximum draught are susceptible to breaking waves in heavy weather, even on the poop deck. Lifelines must always be considered for emergency deck work in heavy weather, as must lifejackets.
- Before undertaking an unusual or undocumented task, take a few minutes to do a risk assessment among the team members, even if only verbally.

MARS 202140

Mooring incident with injuries

➔ A vessel was coming alongside to moor assisted by two tugs. The first lines were passed ashore to assist in bringing the vessel into position along the pier. At one point, the aft spring line got stuck between the ship and a pier dolphin's fender. The Master requested the pilot use the aft tug to slowly clear the line. The Master informed the aft mooring station officer that the tug would pull out a bit in order to clear the line.

An officer was standing near the break of the accommodation and was checking the lead of the spring line. When the mooring rope stuck, it was under some tension which was not noticeable from deck level. As soon as the rope came clear of the dolphin fender, it released up along the ship's side with energy, striking the officer under his jaw and on his right forearm.

An ambulance was immediately called while first aid was provided to the victim. Once at the hospital, the victim underwent X-ray and CT scans. He was diagnosed with a laceration on the chin and a concussion. He was able to return to normal work a few days later.

Lessons learned

- Mooring ropes can contain enough energy to kill or badly injure. Treat them as you would a loaded weapon.

■ **Editor's note:** The victim was very lucky to have sustained only relatively minor injuries. As readers of MARS may have seen in report 201870, a very similar sequence of events ended with a fatality.

MARS 202141

Drydock work – who's in charge of safety?

As edited from IMCA Safety Flash 07/21

➔ A vessel was in drydock undergoing hull painting. The painting area was accessed using the shipyard crane and a personnel basket. During this process it was observed that the workers in the basket were not using safety harnesses. After further questioning it transpired that neither the basket nor the fall arrest equipment had valid test certificates.

The job was stopped and the shipyard was required to correct the situation. Relevant certified equipment was then provided.

Uncertified basket

Working at height without a safety harness

Lessons learned

- Work in drydock is full of opportunities for unsafe acts – be on your guard and always ask questions.
- While in drydock, specific tasks may be subcontracted out by the shipyard. This can then give rise to ambiguous health and safety oversight. If workers are undertaking tasks on your ship, you should have the final word on safety.

MARS 202142

Mooring fatality

As edited from the Dutch Safety Board report published April 2021

➔ A small coastal cargo vessel had discharged in port and was shifting berth. The Master, controlling the vessel, was in visual and verbal contact with the officer on the bridge wing on the starboard side. Due to the construction of the vessel, they could see the crew members on the foredeck but not those on the aft deck – two ABs and a trainee.

Contact was maintained with one AB and the trainee on the aft deck via VHF radio. The other AB on the aft deck was not equipped with a similar radio. The planned manoeuvre was unexceptional and was one regularly carried out. The weather conditions were good.

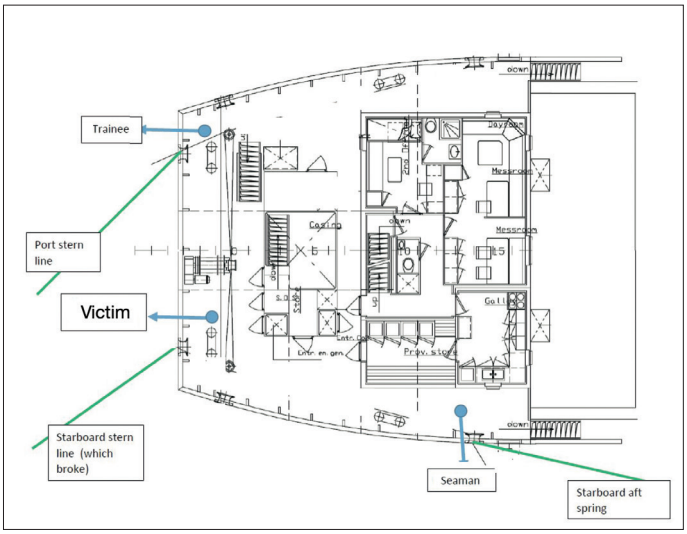
Both ABs were experienced in carrying out mooring operations and berth changes. The procedure for this operation specifies that the aft deck must be manned by two crew members. The day before the accident, the trainee had been deployed on the foredeck, but on this occasion he was stationed on the aft deck for the first time, under the supervision of the ABs.

The three crew members on the aft deck stood relatively close together, but were not in each other's field of vision. Due to the background noise caused by the engines, verbal communication was difficult. Each was responsible for releasing and re-securing a mooring line: the AB on the aft starboard side was responsible for the stern line on that side; the trainee for the stern line on the port side; and the other AB for the aft spring on the starboard side. Because of the short distance to be covered during the berth change, the mooring lines were not coiled on the storage drums during the manoeuvre but left loose on deck.

The aft starboard spring was paid out and then secured. The Master then instructed the AB with the radio to slightly slacken the spring to allow the vessel to go astern a further 5 metres.

As the AB worked the aft spring to give it slack, the two unsecured stern lines started running quickly into the water. The AB stopped the starboard stern line from running out but due to the sternway of the ship, this line become entangled in the propeller. It quickly came under tremendous tension and then failed. The AB was hit by the recoiling section of the mooring line.

The alarm was sounded and first aid was administered immediately and an ambulance was called. In an attempt to stop the severe bleeding caused to one of the victim's legs, a tourniquet was applied. About 40 minutes later the victim was evacuated by ambulance but by that time the victim had fallen unconscious. The victim died in hospital later that day.



The official investigation found, among other things, that:

- The mooring lines left loose on deck were a hazard, and were able to enter the water unhindered.
- The AB that worked the spring line had not taken sufficient rest hours prior to the incident. This may have influenced his actions and his supervisory role.

Lessons learned

- Keeping a clean and unobstructed deck is a best practice that helps reduce risks.
- Communication is key during mooring. The bridge should immediately be advised of any situation that may escalate and cause negative consequences, such as a line in the water near the propeller.

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