Mariners' Alerting and Reporting Scheme

MARS Report No 322 August 2019

MARS 201947

Wrong helm order causes crash

Edited from NTSB DCA16FM003

➔ A specialised heavy-lift cargo vessel with wheelhouse and accommodation forward was inbound under pilotage. The Master, an OOW and a helmsman were also on the bridge. After the first course change under the con of the pilot, he commented that the vessel seemed hard to handle. The Master replied that the vessel was normally quite responsive. The pilot conceded that few vessels like this one, with wheelhouse forward, visited the port. He asked the bridge team to let him know if he oversteered or otherwise did anything they considered out of the ordinary, considering his lack of practice with this type of ship.

As they met an outbound vessel the pilot and Master went to the port bridge wing to monitor their proximity to a berthed ship on their port side. Looking aft, the pilot thought their stern would come too close to the berthed vessel. Wishing to swing the stern away, he ordered increasing amounts of starboard helm in quick succession. The orders were executed, but the starboard helm actually brought their stern close in on the berthed vessel. In looking aft, the pilot had given the wrong helm order and the bridge team had not reacted or otherwise caught the error. The stern nonetheless cleared the berthed vessel, but by now the swing to starboard was very rapid. Notwithstanding emergency manoeuvres, the vessel crossed the 245 metres of the channel and struck some barges on the opposite bank.

Lessons learned

- The bridge team was unaware of the pilot's intention to move the stern away from the berthed vessel. Had they known what he intended, the error may have been caught in time. 'Thinking out loud' before acting is one way for a pilot to communicate their intentions and giving the bridge team a chance to provide input.
- Early indications of the pilot's unease with a wheelhouse forward design should have warned the Master that extra risk mitigation measures would be needed.

MARS 201948

Gas vapour detected in a ballast tank

➔ A tanker was alongside and crew were preparing to discharge the cargo of gasoline when the fixed gas detection system alarm sounded. Hydrocarbon vapours had been detected in water ballast tank 4S. To rule out a potential malfunction of the gas detection system, ship's staff performed the required checks with portable gas meters. These checks confirmed the presence of hydrocarbons in the tank.

The vessel was taken to anchor as a safety precaution. A contingency plan to inert the ballast tank atmosphere was prepared and approved by class and coast state authorities before it was carried out. The vessel was subsequently brought back to berth and the cargo was discharged. After discharge the vessel was re-anchored and a detailed investigation was carried out to determine why cargo vapours had entered the ballast tank.

The investigation revealed that there was a crack in the drain line of the inert gas (IG) deck seal drain line passing though ballast tank 4S. Additionally, the non-return valve was not operating correctly. At the time of loading and during topping up, the main IG isolation valve was left open after the IG system was stopped. The gases from the tank leaked back though the inoperative non-return valve, allowing cargo vapours to reach the deck seal. The 'wet' type deck seal performed its function by not allowing cargo vapours to pass, and the vapours were subsequently flushed out through the drain line that passed through ballast tank 4S. However, the hole in the drain line released water and cargo vapours into the ballast tank.

Hole in drain line passing through BW tank 4S

Lessons learned

- Visual inspections of IG lines and associated elements (deck seal, overboard line) may not be sufficient to detect all deficiencies. Such systems could be pressure-tested to ensure integrity.
- It should be standard practice to shut the IG isolation valve once the IG system is stopped.

MARS 201949

Unstable and unsecured scaffolding falls, causing one fatality

As edited from ATSB (Australia) report 197

➔ On a general cargo ship at anchor, crew cleaned No 1 hold using the ship's mobile scaffolding tower to access areas around the top of the hold and under the main deck. The next day they started similar work in No 2 hold. The ship had a slight trim aft, so the angle on the tank top was about 1.5 degrees by the stern.

Once cleaning at the forward end of the hold was completed the scaffolding was moved aft to continue the work. Immediately after this repositioning, two seamen climbed the tower to resume work on the underside of the deckhead. As they reached the top platform, the entire tower fell towards the after bulkhead. The two men fell about 12 metres to the tank top as the platform scraped down the bulkhead. Although the victims received first aid and were evacuated to a hospital, one was later pronounced deceased.

The investigation found that the scaffolding was of sound construction, in reasonable condition and correctly erected. Rubber-tracked castors fitted at each bottom corner allowed the structure to be moved easily and the castors could be locked to prevent unintended movement. To help secure and stabilise this inherently unstable structure with a high centre of gravity and narrow base, rope lashings or guy ropes were normally secured to the scaffolding at the section below the working platform. These ropes were then led through permanent eyes welded around the inside of the cargo holds and then down to the tank top level.

It appears that after the last move the two men had climbed back to the platform before, or while, the rope lashings were being re-secured. It also is likely that the castors had not been locked. Although both men were reportedly wearing hard hats, safety belts and lanyards, these were not secured.

Lessons learned

- The scaffolding had a height to base length ratio of about 5.2:1. Best practice requires securing guy ropes for a structure of this kind.
- Castors on scaffolds should be locked before use.
- Once in place at height, always secure yourself to a safe spot with fall prevention devices.

■ **Editor's note:** See MARS 201936 for another unsecured scaffolding accident.

MARS 201950

Incorrect helm application goes unnoticed

As edited from NTSB (USA) report DCA16FM032

➔ A loaded bulk carrier was outbound under pilotage with an OOW and helmsman on the bridge. The Master was present on the bridge from time to time but was not integrated with the navigation team. At one point, the pilot reduced the ship's speed so the wake would not affect some nearby berthed wood-chip barges. He did not inform the OOW of the reason for the reduction. He then contacted the pilot of an inbound vessel by mobile phone to arrange a starboard-to-starboard meeting as this was more appropriate for their loaded condition and the depths available in the narrow ship channel. He did not inform the bridge team about this arrangement, nor did the team ask any questions.

Because the speed reduction had reduced the rudder's effectiveness, at one point the pilot ordered hard port rudder and full ahead. The Master had just returned to the bridge and the pilot informed him of the starboard-to-starboard meeting. Some 26 seconds later the pilot ordered midship and then starboard 20. The helmsman confirmed this verbally, but unintentionally put the helm to port 20 instead of starboard 20. This error went unnoticed by the rest of the bridge team. The pilot ordered hard to starboard. The helmsman started to put on more port helm before realising his error. He then put on full starboard helm.

Both the pilot and the Master went to the port bridge wing to view the port aft section. The vessel passed within one metre of the docked barges, but did not strike them. However, the vessel scraped the rocky bottom near the wood-chip dock. There was water ingress in two tanks.

Rocks found in penetrated ballast tank

Lessons learned

- During pilotage, incorrect helm application or incorrect helm order are two errors that are easily made. Bridge teams should always employ closed-loop communications but also visually counter-verify orders and executions as a matter of course.
- Good BRM means keeping the team in the loop.

MARS 201951

Thumb squeezed while unhooking

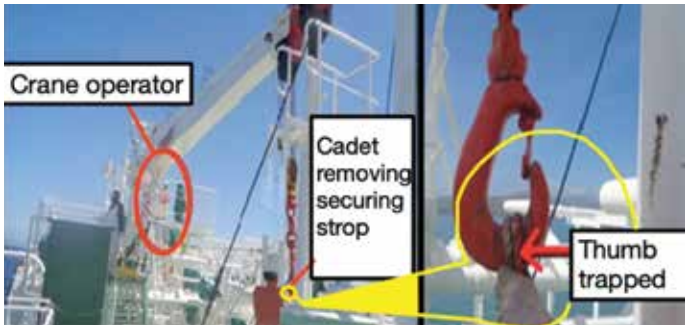
➔ A deck rating and a cadet were bringing the vessel's hose handling crane into operation. The first manoeuvre was to release the hook from its stowed position. The cadet was handling the securing strop on the crane's hook while the deck rating lowered the crane block.

As the cadet began to remove the securing strop, the rating noticed the crane wire getting too slack on its drum; he immediately heaved up on the wire without informing the cadet. The hook moved suddenly upwards, trapping the cadet's left thumb between the hook and the securing strop.

The victim suffered a severe crush injury to the thumb and was signed off the vessel for medical attention ashore.

Lessons learned

- Safe crane operations are essentially a three person job. One for the crane controls, one to manipulate the hook and strops and one to signal to the crane operator.



MARS 201952

A fuzzy plan gets a fuzzy execution while no one checks

As edited from official MAIB (UK) report 1-2019

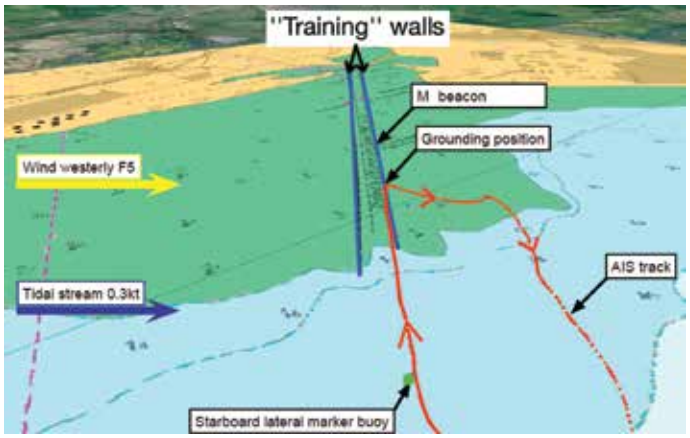
➔ In daylight and good weather conditions a small loaded cargo vessel weighed anchor and proceeded to the pilot boarding station. Once the pilot was on board, the Master and pilot exchanged rudimentary information and completed the vessel's pilotage checklist. Following the Master/pilot exchange, the pilot took the con and began to steer the vessel.

The Master sat in the port bridge chair and another officer stood on the starboard side of the bridge. With the engine on slow ahead the pilot began a 360° turn to port; his intention was to lose time and allow the incoming tide to rise further before entering the port approach channel. Some nine minutes later, on completion of the 360° turn, the pilot increased the vessel's speed to half ahead and steered the vessel towards the entrance of the channel, which was marked by red and green lateral buoys. The pilot manoeuvred the vessel around the starboard buoy at a speed of 5 knots and continued to steer the vessel inwards, maintaining a course that took the vessel close to the starboard edge of the channel, which was bordered by submerged training wall revetments up to 1.5 metres above chart datum.

Within a few minutes, the ship left the dredged channel without the pilot or the bridge team realising. The vessel touched bottom and scraped along the top of the training wall for about 200 metres before coming to a stop in a position about 600 metres from the 'M' beacon (see diagram). The Master stopped the vessel's engine and ordered the crew to conduct a damage assessment. As there was a danger that the rising tide could cause the ship to scrape further along the wall, resulting in more damage, it was decided to refloat the vessel immediately. The vessel was manoeuvred east of the training wall and then south to deeper water. Pumps were used to stabilise the water ingress into the engine room.

Among others, the report found that:

- The pilot did not have full positional awareness when the vessel left the dredged channel and did not fully appreciate the risk of grounding on the training wall.
- No detailed pilotage plan had been made by either the ship or the pilot, and the Master/pilot exchange did not cover all hazards, including that posed by the training walls.
- Insufficient use was made of the vessel's electronic navigation equipment to monitor the vessel's position and assess its progress.



Lessons learned

- When the pilot boards, the exchange of information should be comprehensive. If no plan is offered, by all means ask for one.

MARS 201953

Deck crane failure sheds light on lack of maintenance

➔ A tanker had loaded cargo and the crew were preparing to depart. The pilot was on board and the gangway (8 metres long and weighing 250kg) was to be secured for sea. It was hooked on to the deck crane, which had a safe working load (SWL) of 5,000kg, and lifted away from the ship's side, then brought slowly down to the stowed position. Just before the gangway was in the stowed position the topping cylinder broke away from the crane jib and the crane arm gave way. The gangway fell on to the deck, but as all crew had been standing clear there were no injuries and the gangway was only slightly damaged.

The company investigation found that the hydraulic cylinder eye attachment fitting had not been properly maintained. The fitting was situated in a relatively inaccessible part of the crane and greasing of this part had been neglected.

In response to this accident the greasing point of the cylinder eye attachment has been fitted with a fixed conduit so the operator can perform greasing directly from the safety of a nearby platform, as seen below.

Fixed greasing conduit

Additionally, the job card was updated. Instead of a generic maintenance description, the new card indicates specific greasing points to help crew to identify all maintenance areas.

Finally, the manufacturer reviewed the design of cylinder eye bushings. Subsequent cranes will have bushings made of synthetic material instead of metal to reduce the risk of the steel pin seizing.

Lessons learned

- If lifting equipment is not well maintained even a relatively small weight in relation to the crane's SWL can cause a failure. In this case the lift was only 5% of the crane's capacity.
- Equipment maintenance job cards should be as specific as possible to help crew identify all areas of work that need to be covered.

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