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Seaways

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Mariners' Alerting and Reporting Scheme

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MARS 201368

Poor mooring practice causes fatality

➔ Before arrival, the Master conducted a meeting to brief officers on the mooring plan and the constraints at the port. The vessel, an 85,000 ton bulk carrier, is provided with 16 mooring lines on mooring drums. As it was, the vessel was not accommodated along her full length of 287 metres at the berth; her aft section was to overhang the end of the berth by about 20 metres. The plan was to berth the vessel 6-3-3 forward and aft. This mooring could be achieved by doubling the existing ropes and the mooring plan agreed with the pilot.

The lead of all mooring lines was relatively short as the vessel was not berthed with her full length alongside the berth. The Master protested to the agents and charterers immediately after berthing about the inadequacy of moorings and the unsafe conditions for rigging the gangway.

Some time after berthing it was observed that the vessel's bow had come off the berth by about one metre. The third mate and an OS proceeded to the forecastle deck and the second mate and one AB proceeded aft. To bring the bow alongside, the third mate heaved on the starboard breast line and second mate slackened the stern lines. Then third mate proceeded to heave up a head line and the OS was asked to heave up the starboard breast line. Within 10-15 seconds of the OS being asked to heave up the starboard breast line a loud sound of parting rope was heard. The third mate immediately came to the starboard side where he observed the OS, prone and bleeding between the mooring winch and the control stand.

The broken mooring rope was a 70mm diameter polypropylene monofilament 8-strand plaited rope and on visual examination found to be in general good condition. The rope was found to have parted at a point about 14 metres from the eye. As a result of being hit on the head by the parted breast line the OS was declared dead at the hospital that same evening.

Contributing factors

- The OS, although holding a qualification as an Efficient Deck Hand (EDH) and having been given awareness training for the mooring equipment on this vessel had only recently been promoted to OS from steward. He had little experience of tending to the moorings of a large vessel in such difficult environmental circumstances.
- The plan of mooring equipment at forecastle deck shows that the breast line is passed through the pedestal roller fitted aft of the mooring winch on deck. In this arrangement the winch operator's position is in the snap back zone of the breast line.
- It is likely that the OS did not realise that he was standing in the snap back zone for the rope he was hauling as the snap back markings were no longer clearly marked on deck.
- The head line that the third officer was hauling was approximately twice the length of the line that the OS was working, already pre-tensioned during initial efforts to bring the ship back alongside. Although the ropes were of similar materials it is likely that the shorter length of rope acting as the breast line began taking on a breaking load while the forward head line was still taking up the elasticity of the rope.
- The lead of all mooring lines was relatively short. This reduced the length of wharf available. The vessel was also unable to heave on her stern lines and bow lines simultaneously to keep the vessel alongside as the overhang would have resulted in the stern moving in and the bow moving out.
- Coordination between the terminal, pilots and the vessel was poorly managed and did not provide for safe berthing of the vessel. The issues with inadequate mooring arrangements, safe access and egress and the commercial pressures of starting cargo operations all stretched senior management onboard. This resulted in confusion, incomplete preparation and inadequate shore-to-ship coordination. This failure also carried over to the following evening when another rope failed at the next high flood tide. This time the rope was not being attended to.

The starboard breast rope which parted was passed as illustrated in this picture.

The ill-fated seafarer was operating the winch from the position, as pictured.

The rope parted just after the pedestal roller.

- Given the size of the ship, reduced wharfage and tidal currents, the most appropriate action would have been to have a tug standing by during the manoeuvres.

Actions taken

- The snap back zones have been re-established and now include the pedestal fairlead position. All fairlead rollers at the forecastle deck have been de-rusted and painted to smooth the surface.
- Crew educated on the snap back zones at forward and aft mooring stations.
- A campaign on mooring safety has been carried out in the company fleet. Every vessel in the fleet reviewed their mooring arrangement and prepared a risk assessment for mooring as per fitted mooring arrangement and in normal weather conditions. The countermeasures to these hazards were also identified. The quality and quantity of mooring ropes required for each vessel must be identified and documented.

MARS 201369

A bridge too near

➔ After discharging a parcel of cargo a tanker prepared for departure from her berth adjacent to a bridge across the harbour entrance. Tugs were secured forward and aft using ship's lines for each tug. Departure procedure, as agreed with the pilot, was to tow the vessel upstream against the current, then turn the vessel at a distance that would allow the vessel to gain minimum steerage speed while proceeding with the current for passage past the bridge.

Communication with the tugs was conducted in the local language due to the pilot's advice that the tug crews had a poor knowledge of English. The tug aft was reported to be placing excessive force on the lines and exerting this in a jerky manner creating shock loads. While lining up for the transit through the bridge the aft tug lines parted, thankfully without injury to any crew at the aft mooring station. However, due to the aft tug becoming useless, several minutes later the ship landed against the northernmost bridge caisson leading to structural hull damage to the vessel.

Lessons learned

While a situation of this sort remains impossible to predict until such time as it becomes fact, an agreement could be made with the Harbour Master to sail only on a flood tide. This would enable the ship to stem the current at all times while manoeuvring to pass through the bridge thus offering a much greater margin of safety, greater controllability of the vessel and more time available to assess an unplanned event.

■ **Editor's note:** There is some degree of debate in the maritime community about the advantages and practicality of a common language (English) to be spoken by pilots, tug crews and vessel crews when manoeuvring in ports. In this case it is doubtful a common language would have saved the situation. Practically speaking, it is also a tall order to require tug crews the world over to speak English. What is clear from BRM best practice is that the pilot should readily communicate to the bridge team what is being said to and by the tugs so the bridge team can become an integral component of the equation.

MARS 201370

Passenger briefings less than brief

Edited from official TSB report M07L0158

➔ A small coastal vessel on a scheduled route carrying passengers and cargo to several isolated settlements was proceeding at night towards one of the port stops of the route. A series of events in the wheelhouse

conspired to cause the vessel to sideswipe one of the outlying islands near the port. Within a very short time the vessel was listing heavily to starboard due to water ingress in several tanks.

The impact and the listing to starboard roused most passengers and crew; some of the crew began instructing berthed passengers on the lower decks to go to the main saloon. People had difficulty moving in the crowded corridors and climbing the stairs with the vessel in its listed condition.

Passenger-care crew members, having neither received any information from the bridge nor having sought clarification, were unable to answer passenger questions regarding the situation. Engine room crew attempted to call the bridge, but received no response. Within minutes, passengers were assembling on the observatory deck. Some berthed passengers wore lifejackets; others, still uninformed as to the nature of the emergency, arrived without their lifejackets – some in pyjamas and bare feet. Distribution of lifejackets was done by crew and passengers from the deck storage box just outside the main saloon. Lacking clear directions from crew members, only some passengers donned their lifejackets. Some young children were given adult-sized lifejackets. The vessel remained afloat and was able to dock. At about this time it was discovered that two passengers – one of whom had reduced mobility – had remained in their cabin on a lower deck. Passengers then disembarked and the crew searched the vessel for any remaining passengers.

Company practice was to provide a safety briefing to passengers who embarked at the initial departure port, where passengers were mustered and given a safety briefing on the various lifesaving appliances, including liferafts and lifejackets, as well as their stowage and location. These passengers were told that, in the event of an emergency, they were to assemble in the uppermost central saloon. They also received a demonstration of the general alarm. In this occurrence, 41 passengers embarked at the initial departure port and received the briefing; on the other hand 219 other passengers, who embarked at later ports, did not receive the briefing.

Some of the findings related to passenger briefings and emergency communication brought to light by the investigation were:

- The failure to notify those on board of an emergency situation delayed emergency response and increased the risk of counterproductive behaviour.
- Passengers who are not given safety briefings are deprived of key information, putting them at increased risk in the event of an emergency.

■ **Editor's note:** Although this event occurred in 2007 on a small coastal liner, the lack of adequate passenger briefings is of concern to the entire passenger-carrying industry, big and small. Recently, it was reported to MARS that, on a major English Channel crossing service, passenger safety briefings were totally absent. Safety is beginning to slip. Must we wait for another *Herald of Free Enterprise* to occur before returning to what should already be an established best practice?

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MARS 201371

Poor leadership and a bad lead

➔ In order to attach the aft towline the ship's messenger line was lowered through the aft centreline Panama fairlead to the tug. The mate of the tug received the line and tied it to the tug's messenger line which was attached, in turn, to the steel tow wire. The aft mooring team on the cargo vessel took up the slack in the messenger lines and attempted to heave up the tow wire by hand. The tug's mate realised what the cargo vessel's crew were trying to do and indicated to them, by shouting and using hand gestures, that they should use a winch to heave up the tow wire. The tug's steel tow wire was 44mm in diameter and weighed 7.8 kg/m. While the use of steel wire ropes is common, a significant number of tugs use towlines made from synthetic fibre. These materials are significantly lighter than a steel wire of equivalent diameter and strength and therefore can often be heaved in by hand.

The cargo vessel's mooring team then decided to arrange the hauling operation as pictured below.

The carpenter had taken approximately eight to ten turns of the thick messenger line around the drum. These turns accumulated towards the outboard end of the drum as it rotated due to the angle of the lead from the pedestal fairlead. The free end of the messenger line then became entangled in 'riding turns', causing it to be heaved back into the warping drum with the part under tension. As this was happening, the tow wire came up onto the cargo vessel's deck and the towing eye nearly reached the aft bitt.

As heaving continued, the messenger line slipped off the side of the warping drum, causing the tow wire to drop back down towards the tug. This re-occurred on several attempts until at one point, when the carpenter was standing with his head a few centimetres away from the drum, he was heard to cry out. The second officer stopped the winch and quickly moved around to the drum end. There, the carpenter was found slumped forward on the messenger line with a loop of rope hanging loosely around his neck. After medical attention at the port, the victim was declared dead due to a fracture dislocation of the cervical spine.

Report finding

- Once the aft mooring team decided to use the starboard winch to heave up the tow wire, they chose, and then persisted with, an unsuitable lead for the messenger line. The messenger line not only damaged the winch's hydraulic pipes, but also led onto the pedestal fairlead from the wrong direction. (The pedestal fairlead was designed to assist in taking a breast or spring mooring line from ashore, with the line exiting from the pedestal on its inboard side.)
- The aft mooring team did not follow the recommended practice of taking only sufficient turns on the drum to get traction (normally 3-4 turns), and backing up the tail of the messenger line as it payed off the drum. Instead, they decided to take up to 10 turns of the messenger line on the warping drum, effectively using the drum like a winch.
- Once the eye of the tow wire had been heaved up to the bitts, some method would have been needed to hold the wire safely while the eye was manhandled over the bitts. This would normally be done by holding the wire with a stopper, but a stopper was not employed at the time.
- The aft mooring team showed an absence of basic line-handling skills.
- The arrangement of the equipment on the aft mooring deck of the cargo vessel did not provide an obvious safe method of using a winch to heave in a tug's tow wire through the centre lead.
- The configuration for heaving up a tug's towline onto the aft deck of the cargo vessel was poor. The relative ease and speed with which the operation of securing a tug can be achieved on better laid out mooring decks (such as that shown below) illustrates the importance of good design. Well-designed, ergonomically efficient equipment has a major role in preventing accidents by naturally encouraging people to work safely and discouraging bad practices. Conversely, poorly designed equipment, such as in this case, increases the likelihood of people taking short-cuts and making errors.

An example of good design, which in turn promotes safe practice

MARS 201372

Loss of anchor

➔ A few hours after leaving port the weather conditions deteriorated and the Master reduced speed, taking all necessary precautions for navigation in bad weather. Some time later the weather improved and the Master had the crew check the forecastle for any damage and the lashing and anchor stowage. All was found in order. The same day, the chief officer went forward on safety rounds and both anchors were once again found in the proper stowage position and secured. Later that day the weather turned bad again until the late morning of the next day. At that time the starboard side anchor was found missing while the chain, including the swivel and the end link, was still onboard.

What went wrong

A tongue type stopper is fitted such that the horizontal link of the chain rests on the tongue, thus taking the weight of anchor chain and the anchor, when the anchor is fully housed. It is believed the anchor,

Anchor as secured

Missing starboard anchor

although lashed and secured with turnbuckle, was not fully resting on the chain stopper. This is supported by the fact that the anchor had been found loose some time earlier and the turnbuckle was re-tightened. If the anchor was fully housed and properly resting on the stopper, the lashing would not have been found loose. So the anchor, hanging slightly, was subject to heavy movements due to bad weather. This caused the pin of the D-shackle to be lost, resulting in the loss of anchor.

After the incident, corrective action was taken such that the anchor chain was properly resting on the stopper when the anchor was in the fully stowed position. Also, the locking pin on the D-shackle has been welded to avoid accidental release.

■ **Editor's note:** While it is indeed important to have the anchor chain snug to the stopper, all other gear such as the turnbuckles should also be snugged up so as to hold the anchor fast against the anchor pocket

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Reports will be carefully edited to preserve confidentiality or will remain unpublished if this is not possible.

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