



KISH P & I LOSS PREVENTION CIRCULAR KPI-LP-16-2012 **(A Mooring Accident & Lessons to be Learnt)**

Description of the accident:

On a clear, calm morning, a feeder container ship was berthing starboard side to a terminal. There was a berthing pilot on board & the bridge team consisted of the Master, 3/O and helmsman. The forward mooring station was manned by the C/O, Bosun, an Ordinary Seaman (OS), a Trainee Seaman (TS) and a deck cadet.

The aft mooring station was manned by the 2/O and two ABs. The helmsman, who was also an AB, was expected to join the aft mooring party on completion of his bridge duties, once the vessel had been placed alongside its berth. Two tugs were assisting, one was made fast on the port quarter and the other was standing by forward to assist in accordance with pilot's orders. The aft back-spring was first line sent ashore.

The Master then instructed C/O to send out the forward lines. While the cadet, OS and the trainee were lowering the forward back-spring and a headline through the centreline panama chock, the Bosun, facing aft, operated the winch controls located inside the fore peak store access trunk. The C/O was standing on the starboard bulwark platform and directing the team with hand signals. As the vessel was required to move 10 metres astern, the Master instructed the C/O and 2/O to keep the headline and aft spring slack.

The C/O started to heave on the forward back-spring and, after the stern-lines were ashore, both mooring parties were warping the vessel astern with the C/O estimating that the headline had just the right slack to stop the vessel at the desired location. He also informed the bridge that the TS and OS were passing the two other headlines from the port side of the forecastle. When the vessel reached her intended final position, the Master instructed the C/O and 2/O to start taking weight on their respective head and stern-lines and gave a kick ahead on the engine to stop the vessel's astern movement. Without the Master's knowledge, the pilot then ordered the tugs to stop pushing. Instantly, the ship's bow began to swing away from the berth.

At this time, the OS approached the centreline fairlead to visually estimate how much slack was required on the additional head-lines that were being sent from the port bow for the eyes to reach the bollard ashore. Without warning, the first headline parted, snapped back and struck him on the head.

The C/O immediately reported to the Master that the first headline had parted, but as his line of sight was obscured by the mooring winch, he could not see the injured OS. However, the Bosun informed him that OS had been struck by the parted rope and had collapsed on deck. The C/O promptly conveyed this to the Master. The Master activated the vessel's medical response team and also asked the pilot to arrange for the shore emergency services to attend. Although he was wearing a safety helmet at the time of the accident, and despite receiving prompt medical assistance, the injuries the OS sustained to his head were fatal.

The parted mooring rope was an 8-strand polypropylene rope, 72 mm in diameter and the test certificate stated its minimum breaking strength of 101.6 tonnes when new. The rope had been in use for a year and its condition was assessed as 'satisfactory' when last inspected a month earlier. Following



the accident, a representative sample of the rope outboard of the failure zone was analysed and it was concluded that:

1. The representative sample had suffered a large reduction in strength;
2. The main cause of this strength loss was external abrasion damage;
3. The abrasion damage had slowly become cumulative before the failure incident;
4. Internal abrasion damage also contributed to the failure, but to a lesser degree;
5. The pre-existing external abrasion damage on the failure zone was worse than the representative sample, causing the rope to fail at that point;
6. Thermal degradation had also possibly contributed to the rope's failure.

Root cause/contributory factors:

1. Failure on the part of the OS and other crew to recognise the danger of coming within snap-back zones of taut mooring lines;
2. Both the C/O's and the Bosun's attention were focused towards the stern and neither was aware of the excessive tension on the single headline;
3. Both the C/O and the Bosun were unaware of the OS's location as the former's line of sight was obstructed by the centre mooring winch and the latter was operating the winch controls in an aft-facing position;
4. Failure on the part of the trainee and cadet to warn the OS in time;
5. Unusual location of the winch controllers which had recently been moved from a conventional deck pedestal location to the inner forward side of the fore peak store hatch trunk or coaming, causing the operator to adopt an aft-facing stance (this modification was carried out on the orders of ship's managers to avoid the recurrent heavy weather damage to the controllers in the original exposed location);
6. In the absence of roller fairleads, all mooring ropes had to be led through Panama fairleads or chocks. The high frequency of port calls caused significant external abrasion damage;
7. Improper assessment of the rope's true condition by ship's staff. Ropes should have been withdrawn from service if the company's retirement criteria had been followed correctly;
8. The company required a tool-box meeting before every mooring operation, but no tool-box meeting was held prior to the incident;
9. Ineffective onboard training on the dangers involved in mooring operations;
10. The snatch loading and parting of the mooring rope occurred without the audible warning that usually occurs when a synthetic rope is subjected to high stress and the mooring team was therefore unaware of the imminent danger;
11. All three experienced ABs were deployed to the aft mooring station due to which the forward lines were being tended by relatively inexperienced crew;
12. The pilot did not communicate to the Master that he had given an instruction for the tugs to stop pushing which prevented the Master from anticipating the possible consequences.



Corrective/preventative actions:

1. Conduct a thorough risk assessment of mooring operations and a review of the mooring procedures being followed onboard;
2. Properly inspect all mooring ropes to identify and replace damaged ropes in line with company procedures and ensure a detailed record of inspections and condition is maintained;
3. Conduct training for all crew on identifying and understanding the dangers associated with snap-back zones;
4. Ensure that no modifications are made to the layout of mooring arrangements and associated equipment without completing a risk assessment and obtaining the requisite approvals.

Recommendations made by MAIB to the ship-manager:

1. Ensure the effectiveness of control measures put in place following this accident and review them regularly;
2. Ensure that a sufficient number of experienced crew is available at each mooring station.

Additional Points to Ponder:

1. There are possibilities for existence of communication and language barriers between pilot & master and master with the stations fore & aft; (Human Element)
2. If there has been approved mooring plans or arrangements on board and the lack of sufficient number & workability of fairleads were observed & taken care of; (Plans & Procedures)
3. It is imperative that the retired mooring ropes to be discarded properly & not kept at hand, there are occasions that one might find them useful & then the accidents happen. (Practicality of Operations)

KPI Loss Prevention Team- July 2012