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Taharoa Express: Fatality while sailing from Dampier, Western Australia – 11 July 2002

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Taharoa Express

Taharoa Express is a Panama flag bulk carrier of 145 842 tonnes deadweight at a summer draught of 17.42 m. The vessel, owned by Pacific Transport Trading SA and managed by Hachiuma Steamship Company, was on charter to NYK Line, Tokyo.

Classed with Nippon Kaiji Kyokai, the vessel was built in 1990 by Hyundai Heavy Industries in South Korea. It is of standard bulk carrier design with 9 cargo holds located forward of the accommodation superstructure. It has an overall length of 269 m, a moulded breadth of 43 m and a moulded depth of 23.8 m. Propulsive power is provided by a 5-cylinder B&W 5S70MC diesel engine of 11 974 kW driving a single fixed pitch propeller which gives the ship a service speed of 14 knots.

At the time of the incident, *Taharoa Express* had a complement of 25. The master, mate and the chief engineer were Japanese and the other officers and crew were Filipinos. The master and other officers all held appropriate qualifications.

Parker Point jetty

The Hamersley Iron ore jetty at Parker Point, Dampier, can accommodate ships up to 290 meters in length with maximum drafts of 17.80 meters. The mooring arrangements at the jetty consist of dolphins fitted with bollards and quick release hooks. The hooks can either be released manually or from a central console via electric actuators. Operations supervisors, who oversee mooring operations, prefer to release the hooks from the console.

The incident

Taharoa Express berthed at the Parker Point ore jetty at 0024 on 10 July 2002, to load a cargo of iron ore for Japan. The vessel was secured port side to the jetty, heading west, by four headlines, two forward breastlines, two forward springs, two aft springs and six sternlines to quick release hooks on the mooring dolphins.

After completing the loading of 129 959 tonnes of iron ore at 0109 on 11 July, *Taharoa Express* immediately started unberthing on a falling tide.

Ashore, an operations supervisor at the remote console and two process operators, one forward and one aft, assisted with unberthing the vessel. From the console, the operations supervisor could see the vessel's lines aft but, as he was unable to see the forward lines, the process operator was standing by to inform him when those lines had been released.

The wind was from the south at about 10 knots and the tide was ebbing at about 0.3 knots towards the northeast. Two tugs, secured to the vessel, were pushing square at idling revolutions and the only other vessel in the vicinity, an incoming ship, was about two miles away.

The pilot instructed the master to slack all headlines and sternlines. He then ordered the operations supervisor ashore to release the headlines.

On the ship, the forward mooring crew was under the supervision of the mate who relayed the order from the pilot to slacken the breastlines to the bosun. The mate then moved aft to supervise two crew who were preparing to recover the forward springs. After the headlines had been recovered on board, the bosun engaged the winch for the breastlines, then released the brake. A seaman was told to look over the bulwark and to inform the bosun when the breastlines had been released.

About a minute later, the pilot ordered the operations supervisor to release the sternlines. From the bridge wing, the pilot was able to see that the breastlines forward were slack. At about 0126, while the tugs were still pushing at minimum revolutions to hold

the vessel up to the jetty, the pilot ordered the operations supervisor to let go the breastlines.

The process operator, watching the forward lines, informed the operations supervisor that the hook for one of the breastlines had failed to release, but that the line itself was slack enough for him to go down to the dolphin to release the line manually. The supervisor relayed this information to the pilot on board. However, by the time the operator reached the dolphin, there was considerable tension in the line.

When the operator reported that the line was taut, the supervisor asked the pilot to have it slackened. Instead, the line became tighter and tighter. The operator heard the rope crack with tension and noticed that the hook seemed to be moving.

FIGURE 1: Position of seaman

On the ship, the seaman, looking over the bulwark, shouted to the bosun, in their own language, 'Bosun, wait!'. At this point, the hook released the tensioned breastline. The line whipped back towards the ship, striking the seaman who had been looking over the bulwark. The seaman collapsed on the deck with severe head injuries.

The injured seaman was taken to the hospital at Karratha and the vessel's departure was delayed until the next tide. When the pilot asked the bosun what had happened, the bosun's response was that he had been slacking the breastlines at all times and that the seaman had been standing on a bulwark stiffener to watch the ropes.

The injured seaman's condition was so critical that he was transferred to a hospital in Perth, but he died the next day.

Contributing factors

The seaman who was killed was standing almost directly over the fairlead roller for the breastline that struck him.

Chapter 19, section 4 of the International Labour Organization (ILO) publication 'Accident prevention on board ship at sea and in port' advises that;

> All seafarers involved in mooring and unmooring operations of any kind should be informed of the hazards of engaging in such operations.
>
> A competent person should be in charge of mooring operations and ascertain that there are no persons in a dangerous position before any heaving or letting go operation is commenced.
>
> Ropes and wires are frequently under strain during mooring operations and seafarers should always stand in a place of safety from whiplash should ropes or wires break.

The seaman was not under direct supervision of the mate in the moments leading to the accident. The mate's position on deck and the bosun's position at the controls of the mooring winch meant that the mate, and possibly the bosun, did not have the seaman directly in their line of sight.

FIGURE 2: Mooring winch controls

FIGURE 3: The hook that tripped

In his statement, the bosun said '...I engaged the gear and release the brake and stand by (for) the order of the seaman (who was) posted lookout at the bulwark but the seamen told me 'Bosun wait!'. Suddenly I saw something hit him and (he) fell down badly at the corner.'

There were no passing vessels and the tugs were pushing the ship against the jetty. The breastline had been slack and there was no external force that would have caused the ship to surge and the breastline to tighten. It seemed, therefore, that the bosun might have operated the winch to heave on, instead of slacken, the breastlines before both lines were released.

The hook that had released under load was one of a batch that had been supplied to the owners in 1982 for use at Parker Point after being load tested in the factory on 20 January 1982. Since then, to prevent corrosion, modifications to the hooks had been carried out by Hamersley Iron without referring any proposed changes to the manufacturers.

On 31 July and 12 September 2002, as part of the investigation, a series of tests were carried out on this hook. During the tests, representatives from Hamersley Iron, the hook manufacturer, the Australian Maritime Safety Authority (on behalf of the ATSB) and the testing establishment were present. The hook was tested satisfactorily with a proof load of 130 tonnes and released normally at loads of 25 and 100 tonnes.

The results of tests on the hook were inconclusive in demonstrating any definitive cause for it to have released unexpectedly while the rope was under tension. Disagreement exists between Hamersley Iron and the manufacturers of the hook as to whether the modifications which had been carried out might have contributed to this unexpected release.

Apart from any consequence of the modifications, other possibilities for premature release of the hook are:

- The initial attempt to release the hook may have partially altered the position of the release system, resulting in a release under extreme tension;
- Dirt or rust had interfered with resetting of the hook;
- The hook had not been correctly reset.

FIGURE 4: Hook under test

There was no apparent reason for the failure of the remote release to operate the hook when the breastline was slack. The original hooks had sometimes failed to release because of dust in the release mechanism or mechanical or electrical malfunction. However, although this particular hook had been modified, there was no evidence of any previous problems with premature release of the modified hooks.

There is a possibility that the hook involved in this incident had not been reset correctly before *Taharoa Express* had berthed. Each hook is fitted with an indicator to show when it is

correctly reset. The operator who had reset the hooks for the breastlines said that he had not noticed anything abnormal about the hooks. However, it is possible that, on this occasion, the indicator was faulty or that the operator had not noticed the position of the indicator.

Conclusions

The following factors are considered to have contributed to the incident:

- The seaman was standing almost directly over the fairlead roller for the mooring rope and was not warned that he should have been in a safer position;
- It is likely that the bosun, thinking that the breastlines had been released, operated the winch to recover the lines, resulting in tightening of the line that was still attached to the mooring hook.

In addition, although tests on the hook were not conclusive, one or more of the following possibly occurred:

- The initial attempt to release the hook partially altered the position of the release system resulting in a release of the hook under tension;
- Dirt or rust had prevented the mooring hook from being correctly reset;
- The mooring hook was not correctly reset.

It is possible that modifications to the remote release mechanism might also have been a factor in the hook releasing.

Similar incidents

ATSB reports nos. 40 (*Searoad Mersey*) and 58 (*Pacific Commander*) examine similar incidents of a fatality and an injury to a crew member during mooring operations and emphasise the danger to personnel working in close proximity to mooring ropes.

Recommendations

Appendix 6 of the publication 'Guidelines on the application of the IMO International Safety Management (ISM) Code', suggests that, for vessels preparing for sea, 'Harbour stations' be included in the operations documentation.

For shipowners and operators:

MR20030025

ISM documentation for harbour stations should include appropriate procedures from the ILO publication 'Accident prevention on board ship at sea and in port' to assist seafarers to operate safely during anchoring, mooring or towing operations.

For port operators:

MR20030026

With mooring equipment being critical to the safety of ships in port, modifications to such equipment should be referred to the manufacturers of the equipment. In addition, after any modification, the equipment should be examined and tested for correct functioning.

MR20030027

A thorough investigation of the modifications to the remote release mechanisms for mooring hooks should be undertaken to ensure that the hooks operate safely and reliably.

MR20030028

Regular maintenance and testing of mooring equipment should be carried out and recorded.