KISH P&I CLUB

KISH P & I LOSS PREVENTION CIRCULAR KPI-LP-36-2012

(Analysis of an Unsafe Operation in Tanker Berth)

- **Description of the incident:**

An oil tanker arrived at her offshore loading terminal but due to prevailing severe gale conditions, the vessel remained at anchorage, waiting for the weather to improve. Two days later, an attempt to berth was aborted halfway through, as the wind suddenly increased, and the vessel re-anchored. On the morning of the fourth day, the weather improved with a moderate westerly wind. The vessel approached the single point mooring (SPM) to pick up the chafing chain from the buoy and secure it to her bow chain stopper. At that time, the Mooring Master informed the Master that the SPM had been lying unused for nearly a year.

The mooring equipment of the SPM consisted of a chafing chain (76 mm diameter) joined to a polypropylene hawser (80 mm diameter). This connection included a one metre-long weak link comprising of a large oval master link, a Baldt hinged link and a pear link. The weak link had a 'D' shackle at each end, one passing through the eye of the hawser and the other passing through the first link of the chafe chain. The purpose of the weak link is to reduce the risk of the hawser parting when picking up/casting off the chain, which has an attendant hazard of whiplash.

During the mooring operation, the Master was attending on the bridge, assisted by the 3/O and one helmsman, while the C/O, the Bosun and two ABs, coordinated by the Mooring Master, were at the forward mooring station. The vessel's bow had two mooring chain stoppers: one port and one starboard. Both required the hauling line to be led sharply around a pedestal fairlead roller to the winch drum.

No tugs were available for assistance, and on the final approach heading, the vessel started rolling heavily due to the sea and swell on her beam. While the mooring operation was in progress forward, the remaining deck crew swung out the deck crane and began hoisting the cargo hose clamps from the mooring boat. However, due to the beam swell, the crane hook began to swing wildly as no steadying lines had been attached to it. The suspended equipment, including the heavy steel clamps, repeatedly banged on the shell plating. Once clear of the upper deck railings, the load on the crane hook continued to swing dangerously and was impacting heavily on fittings around the manifold area, endangering the vessel and the attending personnel.

After almost a day's loading, the sea state deteriorated and for safety, the Mooring Master advised the vessel to disconnect the chafe chain and evacuate the berth. Accordingly, cargo loading was suspended and the cargo hoses were disconnected from the manifolds. In order to avoid possible fouling of the propeller by the floating hoses, the Mooring Master instructed the ship's crew to keep them temporarily suspended from the crane hook until the chafe chain was released and he had manoeuvred the vessel sideways to clear the SPM.

With the chief mate still busy with the cargo calculations in the cargo office, the emergency unmooring operation was commenced by the Bosun and two ABs in a 25-knot wind. The 3rd mate was on the bridge, assisting the Master and the pump-man was stationed at the manifold, monitoring the cargo hoses still attached to the deck crane hook. The 2nd mate was taking his due rest.

The chafe chain was under high tension and was being held in position by the chain stopper, which was secured with the locking pin. Due to the very short length of the mooring string, the SPM was very close to the bow. To avoid contact with it, the Mooring Master insisted that instead of using a short kick ahead on the engine, the chafe chain be released by heaving in some slack. Because of the excessive tension caused by the wind, the winch was getting overloaded but the crew did manage to heave in a few centimetres and lift the tongue bar clear.

In this position, the weak link lay exactly on the roller of the pedestal fairlead. Due to the sharp nip around it and the resulting high stress, the inboard pear link parted without warning and the chafe chain together with the outboard end of the broken weak link violently flew out through the chain stopper and fell into the sea. Fortunately, no serious injury resulted among the dangerously exposed crew, except for a small piece of rust that embedded itself in the Bosun's face, just above the left eye. The bridge was informed and while the other crew attended to the wound and removed the rust particle, the vessel now started slowly moving astern, away from the SPM.

Meanwhile, the disconnected cargo hoses were still suspended from the deck crane hook and were temporarily lashed to the hose saddles at the side railings. The sudden astern movement caused these lashings to part and the bights of the hoses fell into

the sea. Reacting quickly, the Master gave a short kick ahead on the engine, and the cargo hoses were unhooked from the crane and safely lowered into the sea.

- **Root cause/contributory factors:**

1. System deficiency – the company did not have detailed procedures for conducting SPM operations, particularly specifying operating environment and tug assistance criteria;
2. Exposed location of SPM;
3. Possible inappropriate heading on final approach;
4. Lack of steadying lines on crane hook;
5. Unplanned and hasty disconnection of mooring in strong wind;
6. Insufficient manpower on bow and manifold area;
7. Poor communications between Mooring Master, ship's Master and deck teams;
8. 8. Absence of tug assistance;

9. Ineffective maintenance of terminal's mooring system- excessive wear on small pear link of the weak link which was not noticed or rectified by the terminal operator;
10. Sharp nip in the hauling part of the chafe chain at the deck pedestal roller;
11. Failure to lower the cargo hoses into the water before releasing mooring;
12. Failure to use engine to ease tension on chafe chain.

- **Corrective/preventative actions:**

1. Company procedures amended to include a new risk assessment before commencing SPM operations. The risk assessment requires the Master to ensure:

- Evidence of Mooring Master's competence/experience and certificate of test and periodic maintenance of the *SPM equipment related to the mooring assembly (hawser-chafe chain- weak link);*
- *If the Mooring Master is not able to provide any of the above documents, the Master must carry out an assessment of the real status and condition of the mooring equipment before commencing mooring operation. Company DPA to be informed accordingly;*
- *Personnel attending at the bow station must be properly briefed before the operation and must be familiar with the hazards and limits of snap back zones;*
- *An experienced and responsible deck officer shall be in charge of the forward station when connecting/disconnecting chafe chain;*
- *Ship's Master shall not entirely depend on the Mooring Master's skill and shall actively take over the con in order to ensure safety of personnel, equipment and vessel;*

2. A fleet circular was sent to the fleet describing the incident and lessons learned;

3. A report of the incident was forwarded to INTERTANKO with the recommendation that the terminal operator ensure the proper integrity and operational condition of the SPM equipment;

4. Incident shared with the industry to avoid similar recurrence;

5. All fleet Masters instructed to closely monitor the condition of every SPM and associated mooring equipment and submit reports to the office on the real status of the SPM equipment at offshore terminals.