



Report of Investigation
into the injury of a sailor
on board local dumb lighter
"Shun Keung 8" (Lic. No.: 22472Y)
on 3 June 2007



Purpose of Investigation

This incident is investigated, and published in accordance with the IMO Code for the Investigation of Marine Casualties and Incidents promulgated under IMO Assembly Resolution A.849(20). The purpose of this investigation conducted by the Marine Accident Investigation and Shipping Security Policy Branch (MAISSPB) of Marine Department is to determine the circumstances and the causes of the incident with the aim of improving the safety of life at sea and avoiding similar incident in future.

The conclusions drawn in this report aim to identify the different factors contributing to the incident. They are not intended to apportion blame or liability towards any particular organization or individual except so far as necessary to achieve the said purpose.

The MAISSPB has no involvement in any prosecution or disciplinary action that may be taken by the Marine Department resulting from this incident.

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1. Summary

- 1.1 On 3 June 2007, an accident happened onboard the dumb lighter “*Shun Keung 8*”. While the lighter was being towed, a fairlead roller detached and the towing rope sprang and hit a sailor on the deck. Consequently his right arm was amputated.
- 1.2 The investigation revealed that the accident was caused by the poorly fabricated roller fairlead. The welds fixing the roller pin to the bedplate were sheared off by the large pulling force of the towing rope during towing operation.
- 1.3 The accident was also contributed by the improper arrangement of towlines that had imposed large stress on the roller fairlead which was not designed to withstand such loading.

2. Description of the Vessels Involved

2.1 Particulars of Vessel 1

Name of the Vessel	:	“Shun Keung 8” (順強8), previous names “Shun Hing 28” (順興28), “Luen Hing 228” (聯興228), and “Joyearn 28” (欣璇28)
Licence No.	:	22472Y
Licence Issuing Authority	:	Hong Kong Marine Department
Trade of Vessel	:	Within Hong Kong Waters
Type of Vessel	:	Class II, Dumb Lighter
Year of Built	:	1989
Built At	:	Xinhui Shipyard, Guangdong
Owner	:	Well Union Logistics Limited
Length	:	46.32 metres
Breadth	:	18.94 metres
Depth	:	5.18 metres
Gross Tonnage	:	1,843.24
Net Tonnage	:	1,290.27
Engine Power	:	N.A.



Fig. 1: Dumb Lighter "Shun Keung 8"

2.2 Particulars of Vessel 2

Name of the Vessel	:	“ <i>Tsui Ho 8</i> ” (翠河8); previous name “Sin Hua No.302”
Certificate of Ownership No.:		B3814
Certificate Issuing Authority :		Hong Kong Marine Department
Trade of Vessel	:	Within river-trade limits
Type of Vessel	:	Class II, Tug, Cat.A
Year of Built	:	1994
Built At	:	Jiangmen Shipyard, Guangdong
Owner	:	Lo Kun Shing
Length	:	22.08 metres
Breadth	:	6.84 metres
Depth	:	3.32 metres
Gross Tonnage	:	137.07
Net Tonnage	:	92.02
Engine Power	:	596.8 kW

2.3 “*Shun Keung 8*” (hereinafter referred as the “*Lighter*”), is a locally licensed single-hold dumb steel lighter. The *Lighter* is fitted with a derrick crane with an “A”-mast located at her forward part. A winch for mooring and towing operations is located on the deck under the “A”-mast (see Fig.2).

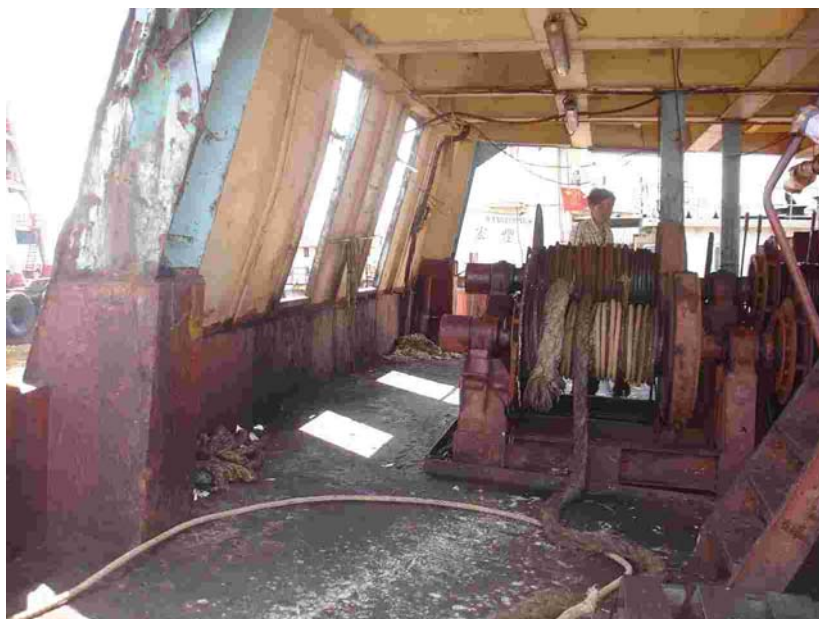


Fig. 2: The Winch at the Forward of Dumb Lighter “*Shun Keung 8*”

3. Sources of Evidence

- a) Person in charge of the *Lighter*
- b) The injured sailor of the *Lighter*
- c) Coxswain of tug boat "*Tsui Ho 8*"

4. Outline of Events

- 4.1 At about 1000 on 3 June 2007, the *Lighter* was alongside the berth at the seawall of sawmills at Ho Yeung Street, Tuen Mun after having finished the discharge of cargo.
- 4.2 A tug boat “*Tsui Ho 8*” (hereafter referred as the “*Tug*”) was then dispatched to Tuen Mun for towing the *Lighter* back to Kowloon.
- 4.3 The *Tug* arrived sometime before 1100. The person in charge of the *Lighter* and two sailors were preparing the tow on board the *Lighter*.
- 4.4 Two towlines were passed to the *Tug* from the *Lighter* by the two sailors. The towlines (wire ropes) were paid out slowly by the winch at the forward of the *Lighter* via roller fairleads (see Fig.3) at port and starboard sides.



Fig. 3: The Roller Fairleads on Starboard Forward of Lighter

- 4.5 The *Tug* ran slowly ahead as the towlines were made taut to pull the *Lighter* slowly away from the berth.
- 4.6 The person in charge of the *Lighter* kept operating the winch to pay out the towlines to adjust their lengths between the *Lighter* and the *Tug*.

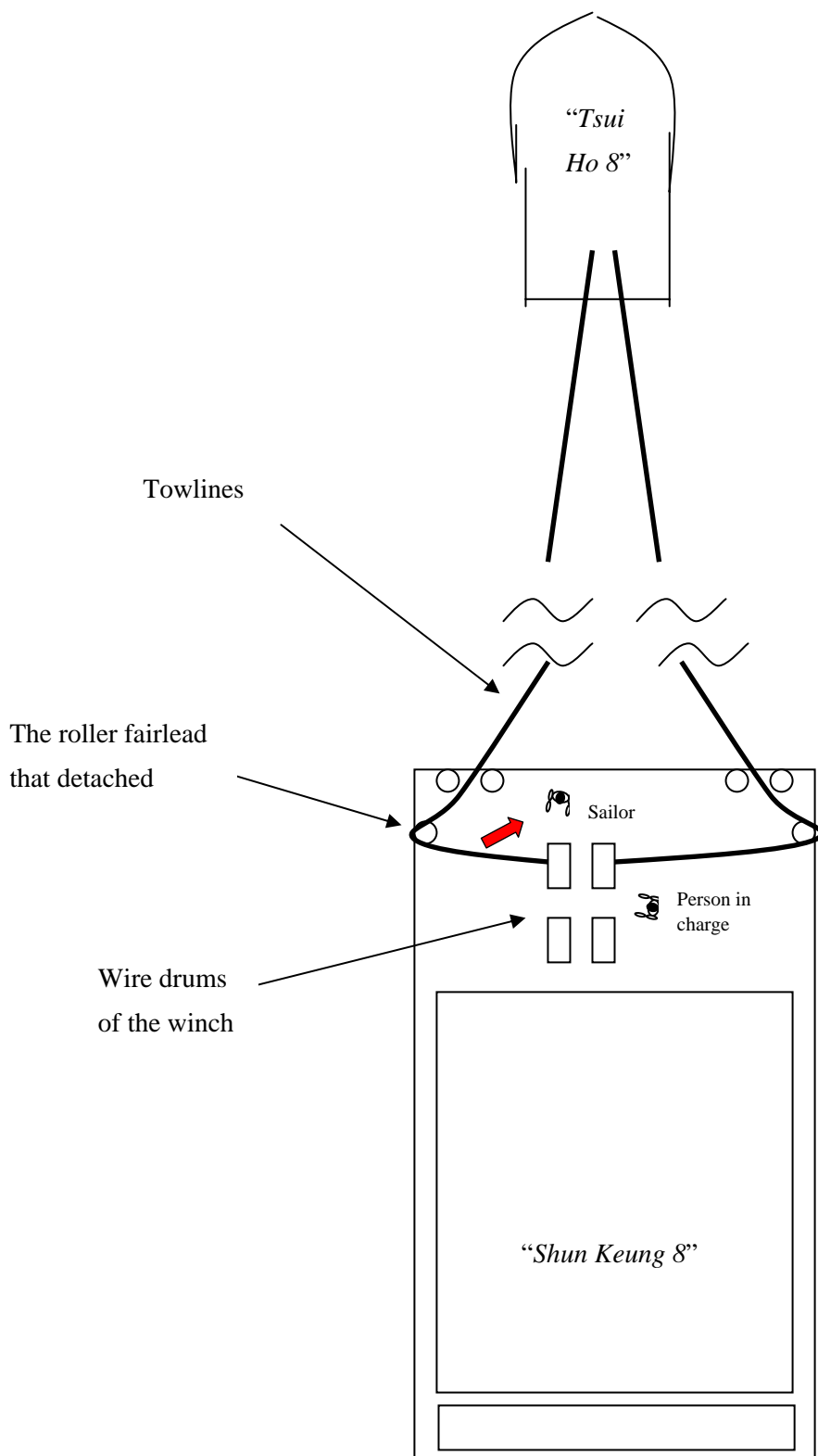


Fig. 4: The Towing Arrangement at the Time of Accident

- 4.7 At about 1100, after the towlines had been paid out about 70 metres in length, the person in charge of the *Lighter* considered that their lengths were appropriate and he applied the brake to stop the winch. One of the sailors approached the winch from port side to manually lock the wire drum of the winch.
- 4.8 Suddenly the fairlead roller at port side detached and dropped into the sea. Consequently the towline at port side sprang towards the winch and hit the sailor (see Fig.4). His right arm was amputated and sent to hospital for medical treatment.

5. Analysis of Evidence

The fairlead structure

- 5.1 After the accident, the detached fairlead roller assembly was lost in the sea. Only the bedplate, which had been welded on the *Lighter's* structure, could be examined for the failure of the fairlead (see Fig.5).
- 5.2 The roller pin was fixed to the bedplate by fusion welding. It was found that the welding did not penetrate and melt into the base metal sufficiently. This had sharply reduced the holding strength of the welds between the roller pin and bedplate and consequently the fairlead could not withstand the large pulling force of the towing rope during towing operation. The welds were sheared off in the incident.

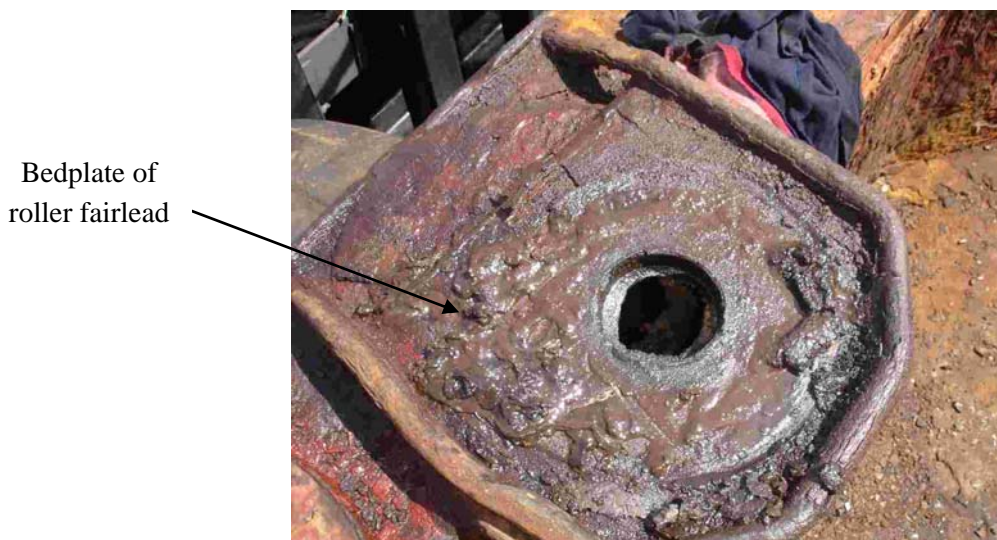


Fig. 5: The Remaining Parts of the Detached Roller Fairlead

Arrangement of towlines

- 5.3 The towlines on the *Lighter* had imposed large stress on the roller fairlead at port and starboard sides. The acute angle that was formed by the towing rope at the subject roller fairlead also made the rope exert greater force than it would be at a smoother leading angle.
- 5.4 The force of the towline under tow should be taken up by the bitts rather than the roller fairleads as the design of fairleads is not intended for such loading.
- 5.5 The breaking strength of the towing rope was about 50 tonnes. At the time of accident, the

tension of each towing rope was estimated to be 11 tonnes. Therefore the side force acting on the detached fairlead by the towing rope would be about 20 tonnes.

- 5.6 No safe working load markings were found on the roller fairleads of the *Lighter*. There was no document to indicate the safe working loads of roller fairleads on the *Lighter* could take on such loading (i.e., 20 tonnes).

The environment

- 5.7 At the time of the accident, the state of weather was good and normal. The weather condition was not considered to be a contributory factor of the accident.

6. Conclusions

- 6.1 On 3 June 2007, an accident happened onboard the dumb lighter “*Shun Keung 8*”. While the *Lighter* was being towed, a fairlead roller detached and the towing rope sprang and hit a sailor on the deck. Consequently his right arm was amputated.
- 6.2 The investigation revealed that the accident was caused by the poorly fabricated roller fairlead. The welds fixing the roller pin to the bedplate were sheared off by the large pulling force of the towing rope during towing operation.
- 6.3 The accident was also contributed by the improper arrangement of towlines that had imposed large stress on the roller fairlead which was not designed to withstand such loading.

7. Recommendations

- 7.1 The owner and person in charge of the *Lighter* should be informed of the findings of the investigation.
- 7.2 A Marine Department Notice should be issued to draw the attention of all concerned parties to the lessons learnt in this accident and advise them the need to observe the following safety practices in order to prevent the recurrence of similar accidents:
- a) roller fairleads should be properly designed and of good mechanical construction;
 - b) roller fairleads should be properly maintained and periodically inspected;
 - c) during towing, the force on towline should rest on bitts rather than on roller fairleads unless the design of fairleads is intended for such loading; and
 - d) the design of fairleads should be substantially strengthened if the fairleads are intended to take up the force of towlines under tow.

8. Submissions

8.1 In the event that the conduct of any person or organization is criticized in a casualty investigation report, it is the policy of the Hong Kong Marine Department that a copy of the draft report is given to that person or organization so that they have the opportunity to rebut the criticism or offer evidence not previously available to the investigating officer.

8.2 The draft report (without conclusions and recommendations) was forwarded to the followings:

Well Union Logistics Limited

The person in charge of “*Shun Keung 8*”

The injured sailor

The Coxswain of “*Tsui Ho 8*”

8.3 No submission was received from any of the above-mentioned parties.

