



Report of Investigation
into the Electrocution on Board
the Dumb Steel Lighter
“Sun Choi Lee 18” Causing
One Fatality on 8 May 2005



The Hong Kong Special Administrative Region
Marine Department
Marine Accident Investigation Section

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.

FATAL ACCIDENT REPORT

Name of the deceased: LEUNG Muk-kan (梁木根)

Hong Kong Identity Card No.: C397368 (7)

Sex: Male

Age: 47

Occupation: Lighterman

Time and Date of Accident : At about 1145 on 8 May 2005

Ship involved : Dumb steel lighter "*Sun Choi Lee 18*"
(*新財利 18*) Lic. No. 22571Y

Owner of the Ship: Grand Joy Development Ltd.
(新悅發展有限公司)

Source of Information: 黃華喜先生(No. 1 Lighterman of the Vessel)
何有先生 (Lighterman of the Vessel)

Place of Accident: Berth No. 5 of Kwai Chung Container Terminal

Type of casualty: Electrocutation

(K. F. KWAN)
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19 January 2006

1. Factual Information

1.1 Description of dumb steel lighter "*Sun Choi Lee 18*"

"*Sun Choi Lee 18*" (hereafter referred as the Vessel), local license no. 22571Y, is a dumb steel lighter with no propulsion power. It is equipped with a derrick crane at the forward of the Vessel to facilitate cargo handling operation. A diesel generator is fitted on the first deck of the A-frame to supply electrical power to the Vessel.

1.2 Particular of dumb steel lighter "*Sun Choi Lee 18*"

Licence Number:	22571Y
Type of Ship:	Dumb steel lighter
Year of Built:	1994
Name of Builder:	Jiangsu Yangzijiang Shipyard.
Owner of Vessel:	Grand Joy Development Ltd
Length:	49.610 metres
Breadth:	19.812 metres
Moulded Depth :	5.177 metres
Gross Tonnage:	2195.37
Net Tonnage :	1536.76
No. of Crew	3



Fig. 1: Photo of dumb steel lighter "*Sun Choi Lee 18*"

2. Outline of Events

- 2.1 On the morning of 8 May 2005, the Vessel anchored at south of Stonecutters Island waiting for berth. At about 1000, the Vessel was towed by a tug to berth No. 5 of Kwai Chung Container Terminal for cargo work.
- 2.2 During the berthing operation, the Number 1 lighterman stationed at forward of the Vessel controlling the mooring winch. The other two lightermen (hereafter referred as Lighterman A and Lighterman B), secured the vessel to the berth with mooring ropes. The Vessel moored alongside the berth at about 1100.
- 2.3 After berthing, the Number 1 lighterman went to the aft of the cargo hold to prepare for cargo work while Lighterman A went to the kitchen to prepare for the lunch. Nobody knew whereabouts of Lighterman B.
- 2.4 At about 1150, Lighterman A called the crewmembers for lunch but Lighterman B did not turn up. Lighterman A then went out to the deck and found Lighterman B lying unconsciously at the port forward open deck area. A live electric extension cable was seen adjacent to his body. As it was raining heavily in that morning, the body of Lighterman B and the electric cable were found wet with rainwater.
- 2.5 Lighterman A called the Number 1 lighterman for assistance. They removed Lighterman B to a shelter area. The Number 1 lighterman reported the case to the company and police. After arrival of ambulance, Lighterman B was sent to the Princess Margaret Hospital. However, he died later in the hospital.

3. Findings and Analysis

- 3.1 It was raining heavily at time of incident. Lighterman B was found lying unconsciously on an unsheltered deck (see fig. 2). His body was soaked with rainwater. At time of the incident he wore a pair of gloves and slippers.
- 3.2 According to the records, Lighterman B had been working as lighterman for more than twenty years. He had been employed on board this Vessel for six months. His duties included routine operation and maintenance of the Vessel.

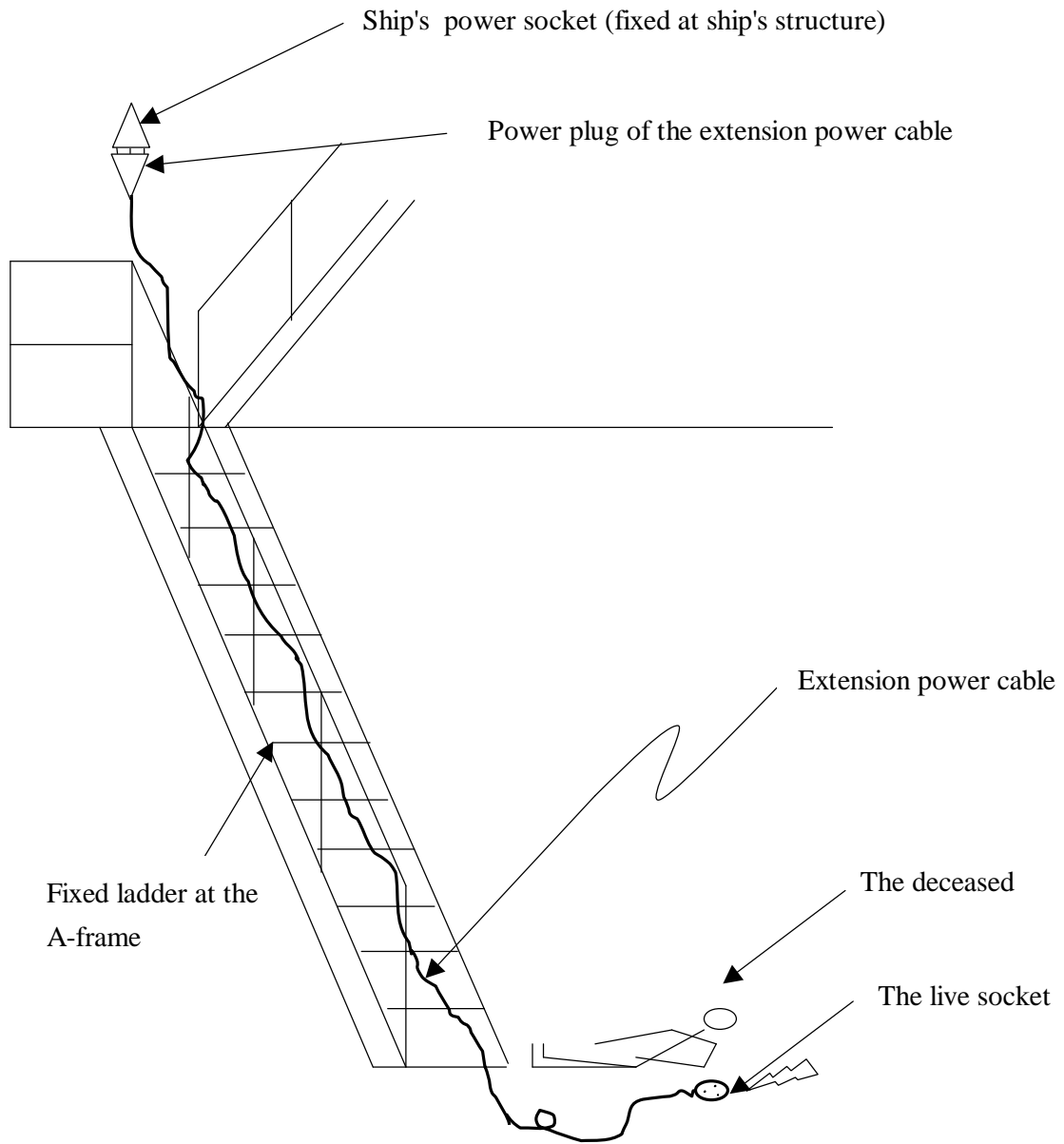


Fig. 2: The scene of the accident

3.3 After the Vessel was moored to the berth, the deceased finished his duty. His colleagues did not know where he went after he finished duty. As his duty related to the maintenance of the Vessel, it is suspected that he might go there to prepare the electric extension cable for the use of a portable electrical equipment.

3.4 The electric power of the Vessel was provided by a 6-cylinder diesel generator. After the accident, a running test of the generator in loaded condition was conducted with following results:

Terminal voltage: 210V a.c.
Frequency: 47Hz
Current: 69A (Maximum meter reading 100 A)

Earth fault protection system was provided onboard the Vessel. Fixed power sockets on the Vessel were provided with earth conductors which connected to the hull of the Vessel.

3.5 The output of the Vessel's generator is to supply power for shipboard electrical equipment. Whenever an electrical fault occurred to its power supply system, the magnitude of output voltage and current would be fatal to any one in a very short moment of time.

3.6 Some portable electrical appliances such as portable bilge pumps, an electric drill, and a disc cutter (see fig. 3) were found on board. In some cases, these electrical equipment required an electric extension cable for use in the remote locations. Two electric extension cables were found on board. However, only the electrical cable involved in the incident could be connected to the fixed weatherproof electric sockets of the Vessel. The other electric cable fitted with 13A power plug did not match the fixed weatherproof power socket.



Fig. 3: Portable electrical equipment that required electrical power from the extension power cable

3.7 The electric extension cable used in the incident was about 13 metres long and made up of two rubber sheathed 2-core wires, no earthing wire was available. The cable was fitted with a power plug at one end and a socket at the other end. During inspection it was found that the general condition of the extension cord was not in a well-maintained condition. There were eleven conspicuous cleavages on the cable sheath. (fig. 4). Rainwater could get into the cable cores through the cleavages that short-circuit or electric shock would be liable to occur. Moreover, the electrical cable had been extended by a similar size of cable joining together at about 1.5 metres from the plug end. The joints were made by twisting each core wiring separately and wrapped with insulation tape. Such a way of joining two cables was a malpractice as the wirings might become loosen when the cables were subject to stress.



Fig. 4: One of the cleavages of the cable.

3.8 The plug of the electric extension cable was a weatherproof 3-connector type. It was plugged to the 220V fixed power socket located at the first deck of the A-frame. After the accident, the power plug was opened up for examination. It was found that the live and the neutral ends were connected but not the earth end because of the 2-core cable (fig. 5). Evidence suggested that the electric extension cable was deprived of earthing connection. In handling such a cable, one would be liable to electric shock, particularly in a wet condition, whenever an electrical fault occurs.



Fig. 5: No earthing line connected to the power plug.

3.9 The power socket of the electric extension cable was of a multipurpose, 3-connector type (fig. 6). There were 2 two-pin and 1 three-pin plug slots at the socket. The socket was left unsheltered and it was wetted with rainwater. Although the case of the socket was made of rubber material, the socket itself was of non-weatherproof design. As it exposed to rainwater it became hazardous to persons working in the area.

3.10 The socket of the electric extension cable was also opened up for examination. Like the plug, no earthing wire was connected. At the time of the incident, the extension power socket did not connect to any electrical equipment.



Fig. 6: Internal inspection of the power socket

3.11 The deceased was found wearing a pair of rubber type slippers. However, this would hardly provide proper insulation to his body to resist any electric shock in rainy weather.

3.12 The autopsy report of the deceased was compatible with a diagnosis that the cause of the death was appeared to be electrocution.

4. Conclusion

4.1 The body of the decease was found lying unconsciously adjacent to the live, wet and poorly maintained electric extension cable at the port forward of the Vessel. It is believed that the deceased was electrocuted when in contact with the live conductors of the defective electric extension cable. However, no body witnessed how the accident happened. Based on the available information obtained, the deceased might have to prepare or retrieve the electric extension cable for portable electrical appliances.

4.2 The investigation has also identified following contributory factors to the accident:

4.2.1. The electric extension cable was not properly maintained;

4.2.2. The non-weatherproof type socket was used in a wet environment;

4.2.3. A 2-core electric cable was used for making the extension power cord. No earthing connections to the plug and socket were provided; and

4.2.4. When handling electric equipment, the deceased was wearing slippers which offered little protection against electric shock.

5. Recommendations

5.1 A copy of this report should be sent to the owner and the operator of the Vessel advising them the findings of this incident to ensure that:

5.1.1. Electrical cables should be properly maintained;

5.1.2. Non-weatherproof electrical socket and wirings should not be used in wet environment;

5.1.3. Earthing wires in the electrical plugs and sockets should be properly connected using 3-core electric cable; and

5.1.4. Wearing of slippers at work should not be allowed, safety shoes should be worn.

6. Submissions

6.1 In the event that the conduct of any person or organization is commented in an accident investigation report, it is the policy of the Marine Department to send a copy of the draft report to that person or organization for their comments.

6.2 The draft report was sent to the Number 1 lighterman and the lighterman of the Vessel for requesting them to revert with their comments. Submission was received from the Number 1 lighterman of the Vessel, amendments were made as appropriate.