Report of investigation into the fatal electrocution accident on board the fishing sampan *Chan Sau Lai* at Cheung Chau Typhoon Shelter on 5 February 2010
Purpose of Investigation

This incident is investigated, and published in accordance with the IMO Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident, Resolution MSC.255(84). 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 An accident happened on board the locally licensed fishing sampan *Chan Sau Lai* at Cheung Chau Typhoon Shelter on 5 February 2010.

1.2 At the time of the accident, the sampan was berthed alongside a fishing vessel *Lee Sze*.

1.3 The coxswain stopped the generator engine and used the electrical power from *Lee Sze* to operate a portable bilge pump to remove bilge water from the engine room of the sampan.

1.4 Electric cables of the fishing vessel *Lee Sze*, was directly inserted to a socket onboard *Chan Sau Lai* to supply electrical power for the pump. The coxswain was electrocuted when he inserted the cables of the pump to the socket.

1.5 The investigation revealed the most probable cause of the accident was due to working on a live circuit without proper wiring connection.
2. Description of the Vessels Involved

2.1 *Chau Sau Lai*

Certificate of Ownership No. : CM65577A  
Licence Issuing Authority : Hong Kong Marine Department  
Type of Vessel : Fishing Sampan, Class 3  
Material of Hull : Glass-reinforced plastic  
Length : 16.00 metres  
Breadth : 4.30 metres  
Gross Tonnage : 35.05 tonnes  
Engine Power : 143.30 kW

“*Chan San Lai*” (hereinafter referred as the *Sampan*) (see Fig.1)

Fig. 1: Fishing Sampan *Chan Sau Lai*
2.2  **Lee Sze**

Certificate of Ownership No. : CM65548A  
Certificate Issuing Authority : Hong Kong Marine Department  
Type of Vessel : Fishing vessel, Class 3  
Material of Hull : Wood  
Length : 32.92 metres  
Breadth : 7.92 metres  
Gross Tonnage : 293.33 tonnes  
Engine Power : 559.5 kW

*Lee Sze* (hereinafter referred as the *Fishing Vessel*) (see Fig.2)

Fig. 2: Fishing Vessel *Lee Sze*
3. **Sources of Evidence**

3.1 The statements of the Engineer of *Lee Sze*.

3.2 Weather report from the Hong Kong Observatory.

3.3 The autopsy report of the deceased provided by the Department of Health.
4. Outline of Events

4.1 At about 0705 on 5 February 2010, the Coxswain of the Sampan manoeuvred his vessel to Cheung Chau Typhoon Shelter and berthed her starboard side alongside the port side of the Fishing Vessel.

4.2 After fastening the Sampan, the Coxswain tried to use a portable electrical bilge pump to remove bilge water in the engine room by the electrical power of the Fishing Vessel. A pair of single core electrical wirings was used as the power extension cable to supply electricity from the Fishing Vessel to the Sampan for the pump.

4.3 One end of the extension cable was connected to an electric plug and it was plugged into a power socket on board the Fishing Vessel by the Engineer. The other end of the extension cable was consisted of two bare wires and they were inserted directly into the holes of the power socket onboard the Sampan by the Coxswain.

4.4 The Coxswain then inserted the power supply cable of the portable bilge pump, also without electric plug, into the power outlet holes of the power socket onboard the Sampan in order to operate the pump by the electrical power supplying from the Fishing Vessel (see figure 3).

4.5 At about 0730, after the Engineer on board the Fishing Vessel plugged in the extension cable, he shouted to the Coxswain asking whether electrical power was available to the portable bilge pump or not, but there was no response. He came out
of his vessel and saw the Coxswain of the Sampan lying on the deck beside the power socket. He immediately cut off the power supply.

4.6 The Coxswain was sent to the Cheung Chau Pier by the Sampan and then to the Cheung Chau Hospital for treatment. At about 0832, the Coxswain was certified dead at the hospital.
5. **Analysis of Evidence**

**Working experience**

5.1 The deceased possessed valid master and engineer certificates for operating a fishing vessel. He was certificated to work on the *Sampan* as Master and Engineer.

5.2 The Engineer of the Fishing Vessel possessed a Local Engineer Certificate of Competence for engine output power up to 150 B.H.P. (about 111 kW). The total engine power of *Fishing Vessel* is 559.5 kW and therefore when the vessel is underway, he was not qualified to work as the Engineer onboard. However, at the time of the accident, *the Fishing Vessel* was stationed inside Cheung Chau Typhoon Shelter.

**The weather condition**

5.3 According to the weather report provided by the Hong Kong Observatory, it was raining at the time of accident at Cheung Chau. The air humidity was high.

**Electrical wiring connection**

5.4 The *Sampan* has its own 220V alternating current diesel generator, but the Coxswain decided to use the power source from the *Fishing Vessel* whose 220V alternating current diesel generator was running. It is believed that the Coxswain of the *Sampan* wanted to save some fuel oil of his own so he used the power supply from the *Fishing Vessel*.

5.5 A pair of single core electrical wirings was used as the power extension cable for supplying electricity from the *Fishing Vessel* to the portable pump placed onboard the *Sampan*. One end of the wirings was connected to an electrical plug while the other end was just bare wires which were directly inserted into the power socket onboard the *Sampan*.

5.6 There power supply cable of the portable pump was not provided with an electrical plug.

5.7 In this accident, it was obvious that the Coxswain of the *Sampan* intended to connect up the two cables using the electrical power socket onboard the *Sampan* as the electrical joint (see figure 3).

5.8 The Coxswain was working on a live circuit. Despite it is not a safe practices, at least the Engineer of the *Fishing Vessel* should ensure that the Coxswain of the *Sampan* had already inserted the wirings (live to live and neutral to neutral) properly and securely into the holes of the power socket on the *Sampan* first before switching on.
The electrical power supply.

5.9 The electrical joint made by the above method was not secured. The connection could easily come off and cause electric shock / electrocution to a person in the vicinity.

**Electrocution**

5.10 Verbal communication method was used between the Coxswain and the Engineer during connection of the wirings. It was evident that the Engineer could not see the Coxswain from his position while he plugged in the electric plug into the power outlet socket because he had to shout to the Coxswain asking him whether electrical power was available.

5.11 The Engineer onboard the *Fishing Vessel* connected the electrical power supply without confirming whether the Coxswain had already finished connecting the cables or not. After he shouted to the Coxswain and received no response, he came out of his vessel and saw the Coxswain lying down on the deck beside the socket.

5.12 It was probable that, after the Coxswain inserted the end of the extension cable into the electrical power socket onboard his vessel, he attempted to do the same for the power supply cable of the portable bilge pump. It was a rainy day with high humidity in the morning on 5 February 2010. The hands and clothing of the Coxswain might have been wetted by the rain. It was probable that while he was inserting the power cable into the power socket, the electrical power supply was switched on and resulted him being electrocuted.

**Fatigue**

5.13 There was no evidence to show that the deceased had suffered from fatigue.

**Autopsy report**

5.14 The autopsy report of the deceased provided by the Department of Health indicated that the cause of death was due to electrocution. Autopsy showed spark skin lesions on neck with typical contact electrical marks on left thumb, left index finger and left middle finger.
6. Conclusions

6.1 At about 0705 on 5 February 2010, the locally licensed fishing sampan *Chan Sau Lai* was berthed alongside another locally licensed fishing vessel *Lee Sze* in the Cheung Chau Typhoon Shelter. It was rainy and the relative humidity was high.

6.2 The Coxswain of *Chan Sau Lai* stopped the generator engine and used the electrical power from *Lee Sze* to operate a portable bilge pump to remove bilge water from the engine room of *Chan Sau Lai*.

6.3 Two single core electrical wirings were used as the power extension cable for supply of electricity from a socket of *Lee Sze*.

6.4 At about 0730, while the Coxswain was on his vessel connecting the power extension cable and the power supply cable of the pump using the power socket outlet holes as the electrical joint, it was probable that the Engineer onboard *Lee Sze* switched on the electrical power and it resulted in the Coxswain being electrocuted.

6.4 The investigation revealed the following main contributory factors to the accident:

* the Engineer and the Coxswain did not use proper electrical connection for the power extension cable in supplying electrical power to the portable bilge pump; and
* the Engineer did not ensure the Coxswain was cleared of electrical hazard before switching on the electrical power supply.
7. **Recommendations**

7.1 A copy of this report should be sent to the owner of *Chau Sau Lai* and the engineer of *Lee Sze* advising them the findings of the investigation into this accident. The owners of the vessels should instruct their crew to observe electrical safety onboard at all time, in particular to use of power extensions cables for portable equipment.

7.2 LVAC Sub-committee on Class III Vessels should remind the local fishermen to follow the safety guidelines in the handbook “Local Fishing Vessel Electrical Safety” issued by the Local Vessel Safety Section, Hong Kong Marine Department.

7.3 A Marine Department Notice should be issued to promulgate the lessons learnt from this fatal accident.
8. **Submissions**

8.1 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 draft report to that person or organization for their comments.

8.2 The draft report was sent to the owner of *Chan Sau Lai* and the Engineer of *Lee Sze* for their comments. There was no comment received from them at the end of the consultation period.