



Report of investigation
into the fatal fire accident
happened on board
the open cruiser, Certificate
of Ownership Number
110048 at Northwest of
Trio Island, Sai Kung
on 10 February 2013



Purpose of Investigation

This incident is investigated in accordance with the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (the Casualty Investigation Code) adopted by IMO Resolution MSC 255(84).

The purpose of this investigation conducted by the Marine Accident Investigation and Shipping Security Policy Branch (MAISSPB) of Marine Department, in pursuant to the Merchant Shipping Ordinance Cap. 281, the Shipping and Port Control Ordinance (Cap. 313), or the Merchant Shipping (Local Vessels) Ordinance (Cap. 548), as appropriate, 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 Shortly before 1730 hrs on 10 February 2013, a locally licensed open cruiser, Certificate of Owner Number 110048, was on fire at the approximate position northwest of Trio Island, Sai Kung. The Coxswain was found floating in the water near to his boat without donning a lifejacket.
- 1.2 Customs and Excise launch CE6 and a Police launch arrived at the scene one after another to assist the Coxswain of the cruiser. They respectively threw a lifebuoy into the water for him and used a boat hook to reach him, but there was no response of him. Before a police officer dived into the sea to help him, the Coxswain sank into the water and went out of sight.
- 1.3 Search and rescue operation was launched immediately with the assistance of the Fire Services Department's launches and Government Flying Services' helicopter respectively. The search and rescue operation was aborted at 2200 on 12 February 2013 without finding.
- 1.4 The fire on the cruiser was extinguished and the boat capsized in the accident. She was towed to the base of Marine Police East Division in Tui Min Hoi, Sai Kung for inspection and investigation.
- 1.5 On 18 February 2013, the body of the missing person was found at southwest of Steep Island. He was certified dead.
- 1.6 The investigation into the accident revealed that the most probable cause of the fire accident on board the cruiser was the ignition of the highly flammable gas of vaporized gasoline, which was accumulated and trapped inside the storage box, by naked-flame of cigarette.

2. Description of the vessel involved in the accident

Certificate of Ownership Number : 110048

License issued by : Hong Kong Marine Department

Type of Vessel : Open Cruiser

Material of Hull : Glass-reinforced Plastic

Length : 5.21 metres

Breadth : 2.24 metres

No. of person permitted to carry : 8 persons

Engine Maker : Outboard Marine Corporation

Engine Power : 111.9 kw

Engine Type : Outboard Patrol Engine



Fig. 1: Same model of vessel involved in the accident

3. Sources of Evidence

- 3.1 The statements of the owner of the open cruiser Certificate of Ownership Number 110048 (i.e. the wife of the deceased Coxswain);
- 3.2 The officer on board Customs and Excises launch CE6;
- 3.3 The officer on board Marine Police launch;
- 3.4 The incident report provided by the Fire Services Department;
- 3.5 The weather report provided by the Hong Kong Observatory; and
- 3.6 The autopsy report of the Coxswain.

4. Outline of Events

- 4.1 At about 1730 on 10 February 2013, an officer in the wheelhouse of the Customs and Excise launch CE6, which was underway from Fat Tong Mun off Tung Lung Chau towards Basalt Island, observed a fire blaze on the horizon. He used a binocular to confirm that it was a small boat on fire. There were no other vessels in the vicinity.
- 4.2 CE6 immediately proceeded to the scene. While on the way, the officer saw a person without wearing lifejacket floating in the water at a distance of about 15 meters from the boat. The officer alerted all the crew on board CE6 to see if there were any other persons in the water.
- 4.3 After confirming that there was only one person in the water, CE6 was manoeuvred close to the person to assist him.
- 4.4 The port side of CE6 approached slowly to the person in the water and a lifebuoy which was thrown from CE6 dropped at about one meter away from him. The person was alerted to hold onto the lifebuoy but there was no response from him.
- 4.5 At the same time, a Police speedboat came quickly towards the port stern of CE6. The officer on board CE6 spoke to the police officers and indicated to them the position of the person in the water.
- 4.6 The police speed boat then closed to the person and tried to reach him with a boat hook but was in vain. While a police officer was taking off his heavy gear strapped to his body and prepared himself to jump into the water for the rescue, the wave and current at the scene drifted the person further away from the speed boat. Before the officer dived, the person had sunk into the sea and went out of sight.
- 4.7 Soon afterwards, other government vessels also arrived at the scene and started the search and rescue (SAR) operation coordinated by Marine Rescue Co-ordination Centre (MRCC). The Fire Services Department launches conducted sea surface and under water searches. The Government Flying Services' helicopter conducted an aerial search.
- 4.8 The Marine Police launches extinguished the fire on the small boat before the arrival of Fire Services Department launches.
- 4.9 The small boat on fire was later confirmed to be a locally licensed open cruiser, Certificate of Ownership Number 110048 (the *vessel*). The accident happened in northwest of Trio Island, Sai Kung (Fig. 2). It

was confirmed that only there was only one male person on board the vessel. She was later towed to the base of Marine Police East Division in Sai Kung for inspection and investigation.

- 4.10 The SAR operation continued until 2200 hours on 12 February 2013 without any finding. On 18 February 2013, the body of the missing person was found at southwest of Steep Island. He was certified dead.



Fig. 2: Approximate position of the accident

5. Analysis

Certification of the *vessel* and the Coxswain

- 5.1 The vessel was issued with an Operating License by the Marine Department with validity of one year from 11 January 2013 to 10 January 2014.
- 5.2 The Coxswain of the *vessel* possessed valid Pleasure Vessel Operator Grade II local certificate of competency issued by the Marine Department on 17 April 2009 valid until 06 March 2039. He was qualified to operate the *vessel* in accordance with section 47(4) of Merchant Shipping (Local Vessels) (Certification and Licensing) Regulation (Cap. 548D).

General arrangement of the *vessel*

- 5.3 A boat of the same model as the *vessel* is shown in Fig. 3. The hull of the *vessel* was made from Glass-reinforced plastic (GRP) materials. One outboard patrol engine with 150 horse power was mounted at the stern. The starting battery was stored under the deck at the starboard stern of the boat. The petrol fuel oil storage tank was mounted under the deck in mid-ship. The seats installed in the *vessel* were made of plastic materials. The two front seats were mounted on aluminum plinths. A box-shaped compartment designated as storage box was located underneath the deck in between the two front seats.



Fig. 3: Arrangement of the boat similar to the *vessel* in the accident

Damage of the vessel

- 5.4 In the incident, the blazing vessel drifted to northwest off Trio Island in Sai Kung and capsized. The capsized vessel was towed to the base of Marine Police in Tui Min Hoi, Sai Kung for inspections. The whole vessel was seriously damaged in the fire (see Fig. 4).

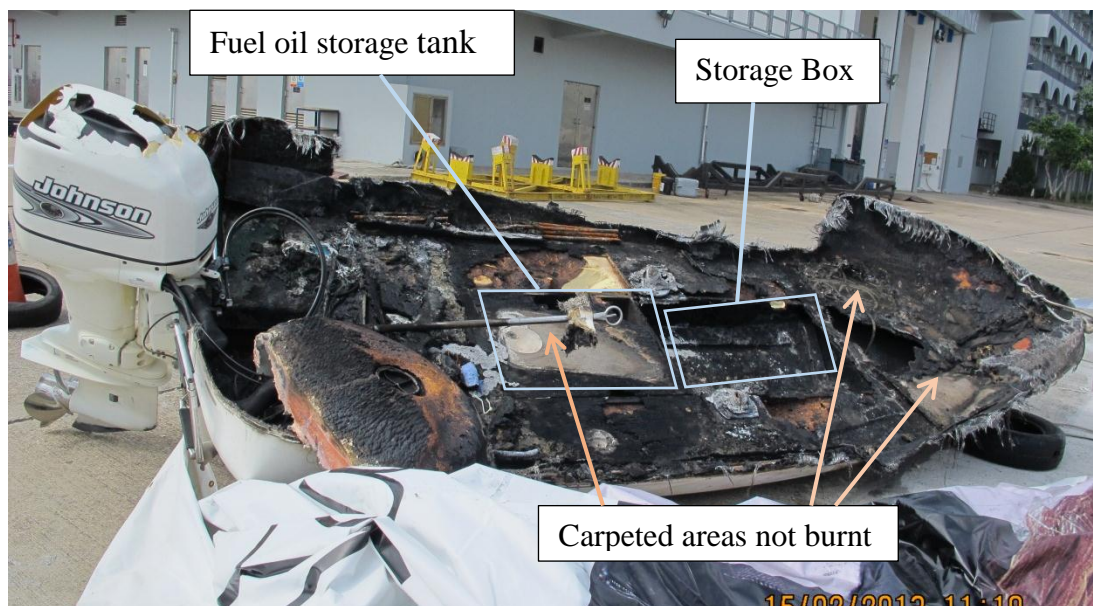


Fig. 4: The capsized vessel in the Marine Police base and was docked

- 5.5 The interior of the storage box was completely charred with more damage at the front end while its outside was not burnt so seriously (Fig. 5).

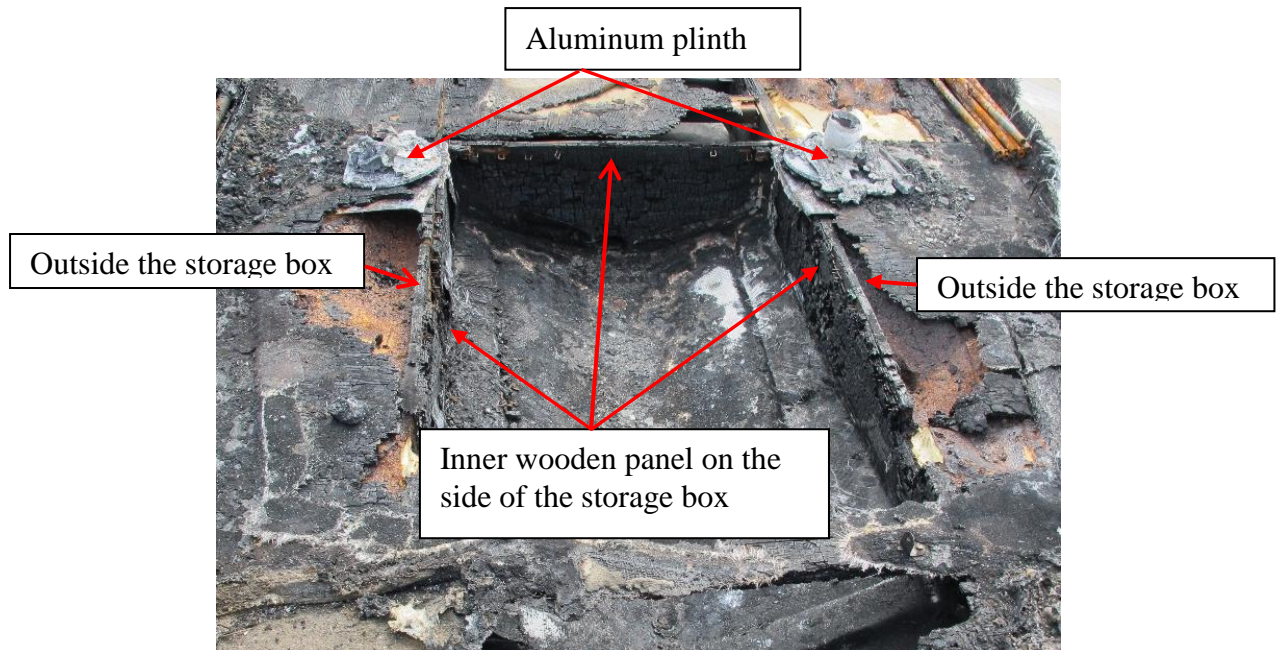


Fig. 5: The completely charred storage space

- 5.6 The two aluminum plinths for the front seats located beside the storage box were melted, indicating that the fire temperature was higher than 660 °C in that area (660 °C is the melting point for aluminum).
- 5.7 The outboard engine and the engine starting battery located at the aft end of the vessel were not damaged by the fire (see Fig. 6).



Fig. 6: Engine starting battery and out board engine

- 5.8 Materials on the upper part of the vessel above the deck were destroyed in fire, however, carpet in certain areas like the fuel oil tank and some areas in the forward of the vessel were only damaged slightly.
- 5.9 The fuel oil tank was found empty during the inspection of the vessel at

the Marine Police base. According to statements provided by the wife of the Coxswain, there were some spare fuel oil bottles on board the vessel but she could not recall where they were stored. It was likely that these bottles were stored inside the storage box.

- 5.10 Although the upper part of the vessel was burnt seriously, the plastic fuel oil storage tank under the deck was not damaged by fire. Unburnt plastic sheet was found at the top corner of the fuel oil tank (Fig. 7) which indicated that the fire did not spread to this part of the vessel before it was put out.

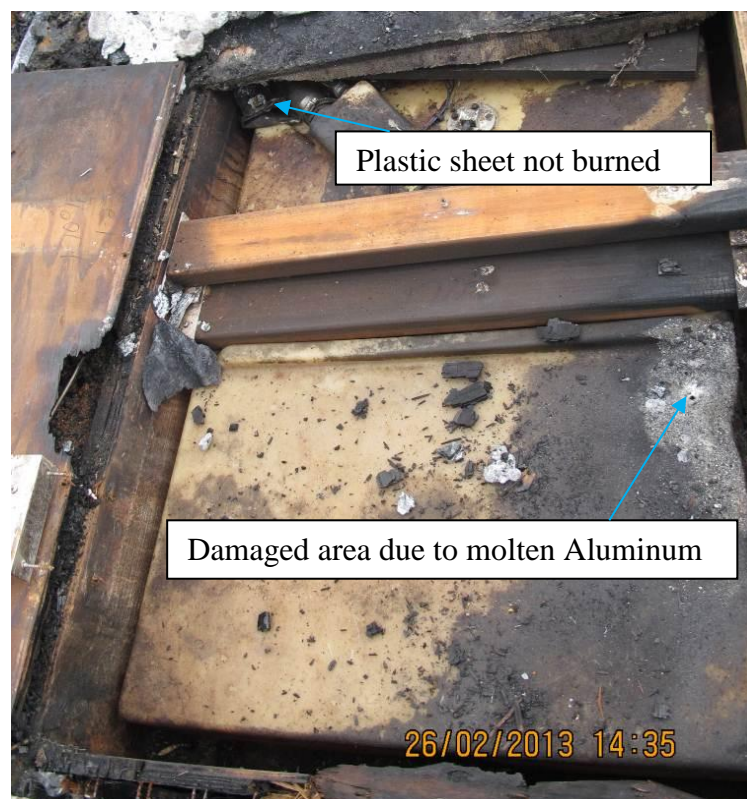


Fig. 7: Top view of the fuel oil storage tank

Autopsy report

- 5.11 The autopsy report of the deceased Coxswain provided by the Department of Health stated that the exact cause of his death was unascertained due to decomposition of the body when he was found. However, the possibility of death due to drowning could not be excluded.
- 5.12 There were no identifiable injuries or other forms of trauma (including burns) found on the body of the Coxswain that could account for his

death. Toxicological analysis by the Government Laboratory also could not indicate that his death was related to drug or poison.

- 5.13 It was probable that the Coxswain jumped into the water to escape from the fire on board the vessel and drowned.

Fatigue

- 5.14 According to the statements provided by the wife of the Coxswain, he worked long hours during the week quite often. Since, it was the first day of the Chinese New Year holiday when the accident occurred, he had to be in Sai Kung a few hours earlier to take his boat out from its storage space ashore into the water. Therefore, there was no evidence to suggest that he was fatigued when operating his boat on that day.

The weather condition

- 5.15 On 10 February 2013, the weather report provided by the Hong Kong Observatory indicated that between 1700 to 1800 hours, the wind direction was fluctuating between northeast two kilometers per hour to southeast 6 kilometers per hours in Tui Min Hoi, Sai Kung. The sky was cloudy. The sea water temperature was about 17 degree Celsius.

Causes of the fire

- 5.16 As there was no witness to tell when and how the fire started, the most probable cause of the fire on board the vessel could only be deduced from the available information and evidence.
- 5.17 According to the statement of the officer on board CE6, he first saw the vessel on fire at 1730 hrs at a distance. As the fire was small at that time, it is probably that the fire was started a few minutes before 1730 hrs. He also observed a number of bursting flames at the middle section of the vessel when CE6 was approaching to the *vessel*. It was probable that the fire was started inside the storage box and it spread to the upper part of the *vessel*.
- 5.18 The storage box was made of wood with a lid on top and it was constructed of the same material throughout. It was found that the front end of the box was burnt down more severely than the other part indicated that the front end of the box had been burnt for a longer period of time.

- 5.19 According to the statement of the wife of the coxswain, there were some spare fuel oil bottles on board the vessel, but she could not recall where they were stored. It was probable that they were stored inside the storage box. However, the size of the storage box was small compared to the size of a standardized portable gasoline-safe container available in the local market. It was deduced that some smaller plastic containers might have been used by the Coxswain for the storage of gasoline inside the storage box.
- 5.20 It is probable that there was fuel leakage from the fuel containers inside the storage box. It is believed that the fuel leakage was of small amount only due to the fact that, if the leakage amount was large, fuel oil inside the box would be passing through the drain hole at the bottom of the box to the bottom of the hull. Should the fire have started, the bottom part of the hull would be burnt seriously. However, it was found that there were no burning marks in the fuel tank compartment to which the storage box drained, indicated that the leakage amount of fuel was small. Hence, the small amount of gasoline leaked from the fuel container(s) vapourized and filled up the interior space of the storage box. The fire was started when the vapour was ignited.
- 5.21 According to the wife of the deceased, the Coxswain was a heavy smoker. It was quite probable that the Coxswain was smoking while operating his boat. The cigarette accidentally ignited the gas vapour inside the box and started the fire.
- 5.22 Startled by the sudden appearance of a big flare due to gas ignition/fire explosion, the Coxswain may have jumped into the water to escape from the fire. It is consistent with the results of the autopsy report showing that there were no identifiable injuries or other forms of trauma (including burns) on the body.

6. Conclusions

- 6.1 Shortly before 1730 hrs on 10 February 2013, a locally licensed open cruiser, Certificate of Owner Number 110048, was on fire at the approximate position northwest of Trio Island, Sai Kung. The Coxswain was found floating in the water near to his boat without donning a lifejacket.
- 6.2 Customs and Excise launch CE6 and a Police launch arrived at the scene one after another to assist the Coxswain of the cruiser. They respectively threw a lifebuoy into the water for him and used a boat hook to reach him, but there was no response of him. Before a police officer dived into the sea to help him, the Coxswain sank into the water and went out of sight.
- 6.3 Search and rescue operation was launched immediately with the assistance of the Fire Services Department's launches and Government Flying Services' helicopter respectively. The search and rescue operation was aborted at 2200 on 12 February 2013 without finding.
- 6.4 The fire on the cruiser was extinguished and the boat capsized in the accident. She was towed to the base of Marine Police East Division in Tui Min Hoi, Sai Kung for inspection and investigation.
- 6.5 On 18 February 2013, the body of the missing person was found at southwest of Steep Island. He was certified dead.
- 6.6 The investigation into the accident revealed that the most probable cause of the fire accident on board the cruiser was the ignition of the highly flammable gas of vaporized gasoline, which was accumulated and trapped inside the storage box, by naked-flame of cigarette.
- 6.7 The safety factors revealed by the investigation were:
 - a) the owner/coxswain of the cruiser may have improperly stowed spare gasoline fuel on board; and
 - b) smoking of cigarette or causing naked-flame on board cruiser installed with gasoline fueled outboard engine is prone to fire and explosion hazards.

7. Recommendations

- 7.1 Marine Department Notice should be issued to promulgate lessons learnt from this accident.

8. Submissions

8.1 Copies of the draft report of investigation, in its entirety, have been provided to the following parties for comments:

- a) The officer on board Customs and Excises launch CE6;
- b) The officer on board the Marine Police launch firstly arrived at the scene; and
- c) The owner of the cruiser.

8.2 At the end of the consultation, there was nothing with regard to any comment received from them.