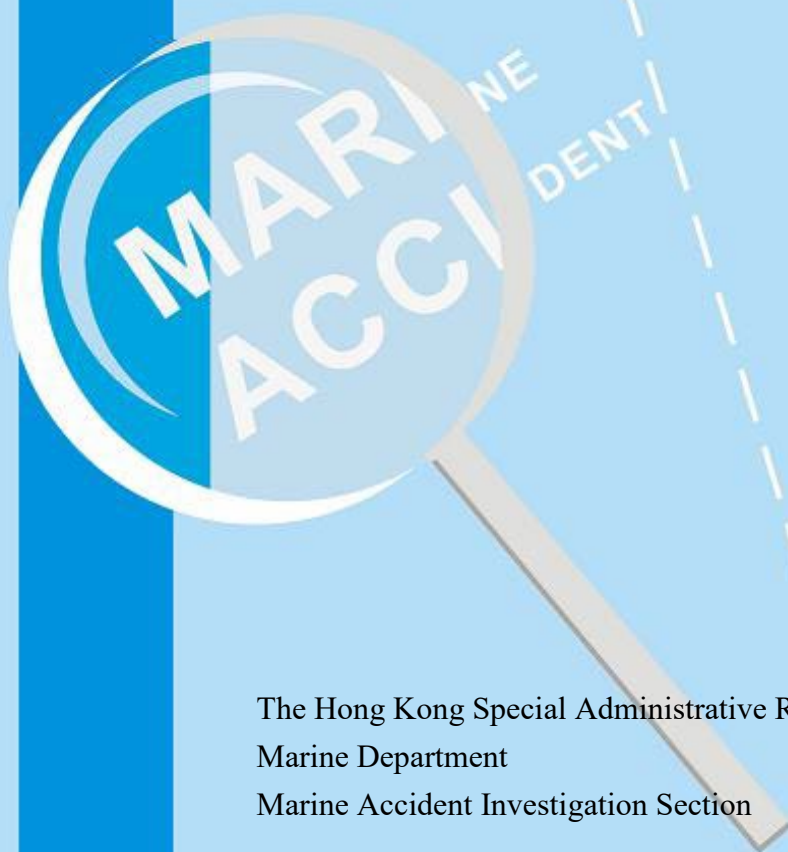




**Report of investigation
into a fatal accident on board the Hong
Kong registered general cargo vessel
“*Ocean Gemstone*” at Morong
anchorage, Indonesia on 19 April 2023**



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

25 March 2024

Purpose of Investigation

The purpose of this investigation, conducted by the Marine Accident Investigation Branch (MAIB) of Marine Department, is to understand the causes of the incident by investigating the circumstances leading to its happening with the aim of enhancing the safety of life at sea and preventing similar incidents from occurring in future.

It is not intended to apportion blame or liability towards any particular organization or individual except so far as necessary to achieve the said purpose.

The MAIB 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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Summary

On 7 April 2023, the Hong Kong registered general cargo vessel “Ocean Gemstone” (*the vessel*) departed from the port of Kolkata, India in ballast condition to the port of Futong, Indonesia (*the loading port*) for loading the cargo of wood pulp.

At 1345 hours on 19 April 2023, *the vessel* arrived at the Morong anchorage and dropped her anchor at position 01° 54.2’ N, 101° 50.8’ E while waiting for berth. The deck crew members and the second engineer of *the vessel* (the 2/E), led by the chief officer of *the vessel* (the C/O), opened the hatch covers and tween deck hatch pontoons of the No.1 cargo hold (*the hold*) and carried out painting work for the upper part of *the hold*’s bulkhead.

At about 1620 hours, the 2/E observed that the chief engineer of *the vessel* (the C/E) entered *the hold* alone to inspect the water ingress detection system and mechanical ventilation system (*the systems*) in *the hold* as usual. Soon after, the 2/E suddenly heard screaming followed by a sound of an object hitting heavily against the tank top of *the hold* (*the tank top*). The 2/E immediately stopped his work and found the C/E lying unconsciously on *the tank top* near the vertical ladder just under the aft access manhole of *the hold* (*the access manhole*¹). The 2/E reported the accident to the C/O. The C/O immediately reported to the master of *the vessel* (the Master) for help. At 1623 hours, the Master urgently organized crew members of *the vessel* to rescue the C/E who was found serious bleeding on his head with no vital signs. The Master reported the accident to the management company of *the vessel* (*the Company*) and the local agent for seeking urgent medical assistance. At 0045 hours on 20 April 2023, the C/E was transferred to the rescue boat. At 0400 hours, the C/E was declared dead by the doctor upon arrival at the shore hospital.

The investigation identified the contributory factors leading to the accident were that the C/E failed to comply with the requirements of “Code of Safe Working Practices for Merchant Seafarers” (*the Code*²) to seek a permission and take suitable control measures for the safe entry to

¹ The aft access manhole located at the tween deck of *the hold* for access to/ from the lower cargo hold via a fixed vertical ladder.

² *The Code* is a publication required to be carried onboard Hong Kong ships pursuant to the Merchant Shipping (Seafarers) (Code of Safe Working Practices) Regulation (Cap. 478M).

the hold; the crew members of *the vessel* failed to follow the requirements of *the Code* to secure the lid properly and use warning signs to indicate the hazard of falling from the vicinity of *the access manhole*; the crew members of *the vessel* failed to comply with the requirement of *the Code* and shipboard safety management system (SMS) to conduct toolbox meeting before work and implement the required control measures during work; and the C/E failed to comply with the requirements of *the Code* and shipboard SMS to conduct a risk assessment for his inspection work in *the hold*.

The investigation also found that the shipboard safety training, in particular on conducting risk assessment and toolbox meeting, supervising the implementation of preventive measures, wearing appropriate personal safety protection equipment, was ineffective; and the C/E lacked safety awareness to the risks of his inspection work in *the hold*.

1. Description of *the vessel*

Ship name	: Ocean Gemstone (Figure 1)
Flag	: Hong Kong, China
Port of registry	: Hong Kong
IMO number	: 9445239
Type	: General Cargo
Year built, shipyard	: 2008, I – S Shipyard Co., Ltd, Japan
Gross tonnage	: 7,454
Net tonnage	: 3,784
Length overall	: 110.67 meters
Breadth	: 19.20 meters
Depth	: 13.50 meters
Engine power, type	: 3900 kW, MAN B&W 6L35MC
Classification society	: Korea Register
Registered owner	: Ocean Shipping Management Co., Limited
Management company	: Dalian Ocean Shipping Management Co., Ltd.



Figure 1: Ocean Gemstone

2. Sources of evidence

- 2.1 Information provided by the Master, the crew members and *the Company of the vessel*.

3. Outline of events

(All times were local time UTC + 7 hours)

- 3.1 On 7 April 2023, *the vessel* departed from the port of Kolkata, India in ballast condition to Penang, Malaysia for redelivery of *the vessel* from the charterer to the owner.
- 3.2 On 12 April 2023, *the vessel* was drifting in the safe waters near the position 03° 32.0' N, 100° 18.0' E after the redelivery and waiting for the next voyage instruction from *the Company*. The deck crew members of *the vessel* commenced to clean *the hold* and the No.2 cargo hold for the preparation of cargo loading.
- 3.3 On 15 April 2023, the upper and lower parts of both cargo holds were completely cleaned.
- 3.4 On 16 April 2023, the *Master* received the voyage instruction from *the Company* that *the vessel* was required to sail to *the loading port* for loading wood pulp and that both cargo holds were required to be de-rusted and painted before loading.
- 3.5 The upgrading work of cargo holds³ was nearly completed during time of *the vessel's* drifting except for the painting work for the upper parts of both cargo holds' bulkheads (Figure 2).

³ The work refers to the maintenance of cargo holds when they are empty, such as de-rusting, painting and greasing, etc.

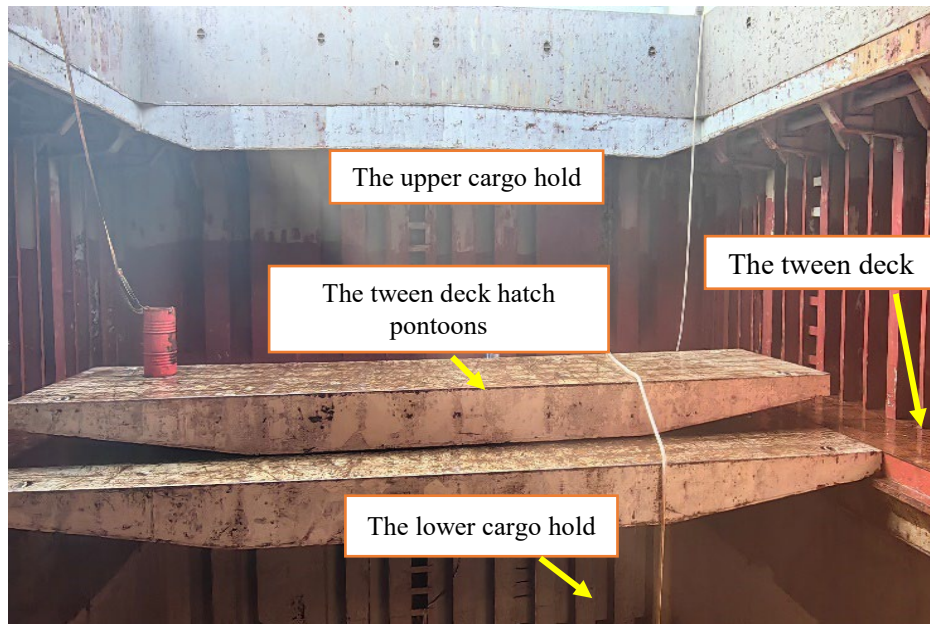


Figure 2: Construction of *the hold*

- 3.6 At 2200 hours on 18 April 2023 *the vessel* stopped drifting and sailed to *the loading port*.
- 3.7 At 1345 hours on 19 April 2023 *the vessel* arrived at Morong anchorage and dropped her anchor at position 01° 54.2' N, 101° 50.8' E while waiting for berth.
- 3.8 In the afternoon of that day, the deck crew members and the 2/E, led by the C/O, opened the hatch covers and tween deck hatch pontoons of *the hold* and continued to carry out painting work for the upper part of *the hold's* bulkhead.
- 3.9 At around 1620 hours, the 2/E observed that the C/E entered *the hold* to the tween deck alone for routine inspection to *the systems* in *the hold* as usual. Soon after, the 2/E suddenly heard screaming followed by a sound of an object hitting heavily against *the tank top*. The 2/E immediately stopped his work and looked down to the lower cargo hold and found the C/E lying unconsciously on *the tank top* near the vertical ladder just under *the access manhole* (Figures 3 & 4).



Figure 3: *The access manhole* located at the tween deck of *the hold* for access to/ from the lower cargo hold

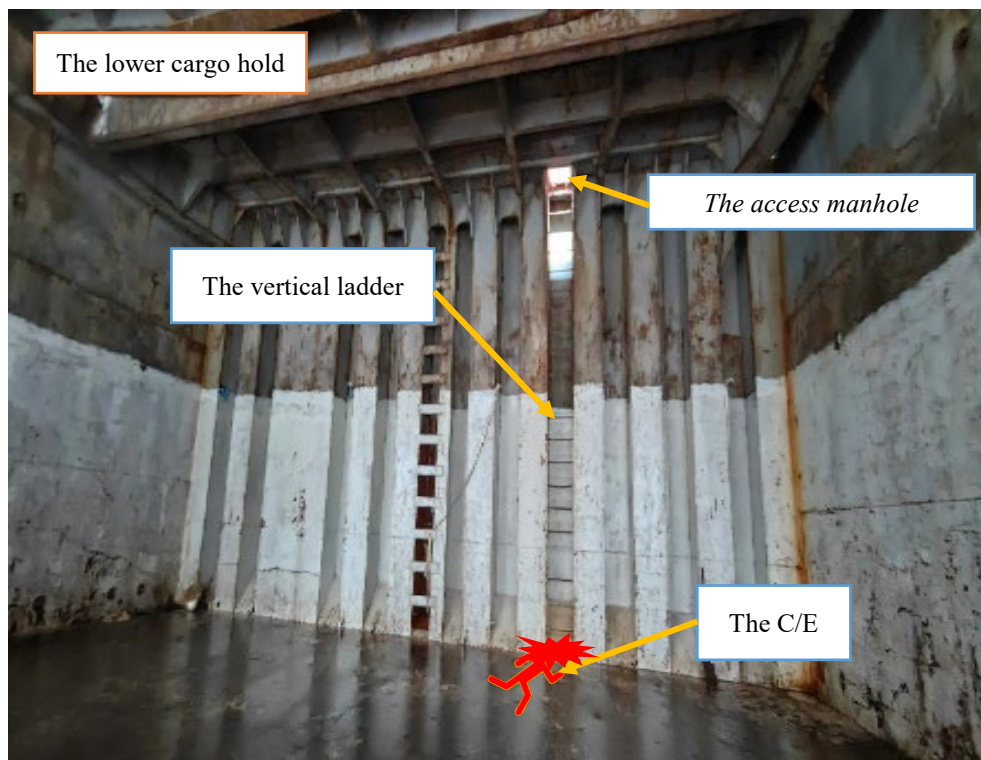


Figure 4: The accident site

- 3.10 The 2/E immediately reported the accident to the C/O who was working in *the hold*. They entered the lower cargo hold to check the condition of the C/E and reported to the Master for help. At 1623 hours, the Master urgently organized crew to rescue the C/E.
- 3.11 At 1625 hours, rescue crew arrived at the scene with a stretcher and the C/E was found lying on *the tank top* with serious bleeding on his head, brain tissues gushing out, no breathing and no pulse.
- 3.12 The Master reported the accident to *the Company* and local agent for seeking urgent shore medical assistance. At 2330 hours, a rescue boat berthed *the vessel's* side. At 0045 hours on 20 April 2023, the C/E was shifted to the rescue boat and further transferred to shore hospital for emergency treatment.
- 3.13 At 0400 hours, the C/E was declared dead by the doctor upon arrival at the shore hospital.

4. Analysis

Certificates and manning

- 4.1 The statutory trading certificates of *the vessel* were valid at the time of the accident. *The vessel* was manned by 18 crew members and fulfilled the requirements stipulated in the Minimum Safe Manning Certificate of *the vessel* issued by the Hong Kong Marine Department (HKMD).
- 4.2 The Master had about eight years of experience as a master. He possessed a Class 1 (Deck Officer) License issued by HKMD, valid until 20 May 2024.
- 4.3 The C/O had about two years of experience as a chief officer. He possessed a Class 2 (Deck Officer) License issued by HKMD, valid until 14 April 2026.
- 4.4 The Second Officer had about three and half years of experience as a second officer. He possessed a Class 3 (Deck Officer) License issued by HKMD, valid until 17 December 2025.
- 4.5 The Third Officer had about five months of experience as a third officer. He possessed a Class 3 (Deck Officer) License issued by HKMD, valid until 22 June 2027.
- 4.6 The C/E had about nine years of experience as a chief engineer. He possessed a Class 1 (Marine Engineer Officer) License issued by HKMD, valid until 7 December 2023.
- 4.7 The 2/E had about ten months of experience as a second engineer. He possessed a Class 2 (Marine Engineer Officer) License issued by HKMD, valid until 19 May 2026.
- 4.8 The Third Engineer had about five months of experience as a third engineer. He possessed a Class 3 (Marine Engineer Officer) License issued by HKMD, valid until 18 March 2025.
- 4.9 The Fourth Engineer had about one and half years of experience as a fourth engineer. He possessed a Class 3 (Marine Engineer Officer) License issued by HKMD, valid until 5 January 2025.

- 4.10 There were no abnormalities noted with regard to the certification and experience of the crew members concerned.

Fatigue, alcohol and drugs abuse

- 4.11 There was no evidence to show that the crew on board suffered from either fatigue at work or abuse of alcohol and drugs.

Weather and sea conditions

- 4.12 On the day of the accident, the sea was smooth, and the visibility was good. The weather was cloudy with light breeze easterly wind of Beaufort wind scale Force 3. The weather and the sea conditions were not considered to be the contributory factors to the accident.

Cause of death

- 4.13 Nobody witnessed the accident but the C/E was found lying on *the tank top* near the vertical ladder just under *the access manhole* as indicated in Figures 3 and 4. It could be deduced that the C/E was trying to enter the lower cargo hold of *the hold* via *the access manhole* to inspect *the systems*, he might have missed his steps or lost his grip while climbing onto the vertical ladder and accidentally fell onto the tank top at the height of about 7.4 meters from *the access manhole*.
- 4.14 The C/E's helmet fell off during the accident and lost its function to provide essential head protection for the C/E in the event of the impact. According to the autopsy report, the C/E had open wounds on the face and head and comminuted fractures on the head, face and chest; the cause of death was due to blunt force in the head area resulting in brain lacerations, which was consistent with the accident of falling from height.

Illumination of the working site

- 4.15 The hatch covers of *the hold* was fully opened and the tween deck hatch pontoons of *the hold* was half-opened⁴. The accident

⁴ The tween deck consisted of eleven hatch pontoons, the aft parts of hatch pontoons were stacked on the fore part of hatch pontoons at the time of the accident.

happened at around 1620 hours on the day under the prevailing circumstances of daylight in the tropical area. The illumination was not considered to be the contributory factor to the accident.

Safe entry to cargo holds

- 4.16 According to section 16.7 of *the Code*, entry to cargo hold should be undertaken on the authority of a responsible ship's officer and all appropriate pre-entry precautions should be undertaken. When necessary, lifelines and safety harnesses should be used.
- 4.17 Section 17.1 of *the Code* stipulates that anyone working in a location where there is a risk of falling may be regarded as working at height; work at height should be subject to risk assessment, and suitable control measures should be taken to protect those who may be put at risk; and depending on the severity of the risk, a permit to work may be required.
- 4.18 The investigation revealed that the C/E did not notify anybody before entering *the hold* and did not wear a safety working suit nor a safety harness with a lifeline for protection against falling. He failed to comply with the requirements of *the Code* to seek permission from the responsible ship's officer and take suitable control measures for the safe entry to *the hold*.

Safety measures for hazards onboard

- 4.19 Section 9.1.2 of *the Code* requires that safety signs that include hazard warnings should be used to indicate hazards where the hazard cannot be removed, and section 9.4.7 of *the Code* advises that yellow signs are advisory and mean be careful or take precautions.
- 4.20 Section 16.6.6 of *the Code* requires that the hatch lids when open should be easily and safely secured against movement or accidental closing. Adequate locking pins, steel hooks or other means should be provided.
- 4.21 According to the information provided by *the Company*, the lid of the access manhole was kept open and lashed by a rope as shown in Figure 5 before the accident. The investigation found that no

warning signs were used to indicate the hazard of falling from the vicinity of *the access manhole*. The investigation also found that the lid of *the manhole* was not secured by steel locking pin and was not opened properly. The lid might therefore obstruct the C/E from entering the lower cargo hold of *the hold* and might cause his falling due to missing steps or losing grip while climbing onto the vertical ladder.

- 4.22 The crew members of *the vessel* failed to follow the requirements of *the Code* to secure the lid properly and use warning signs to indicate the hazard of falling from the vicinity of *the access manhole*.

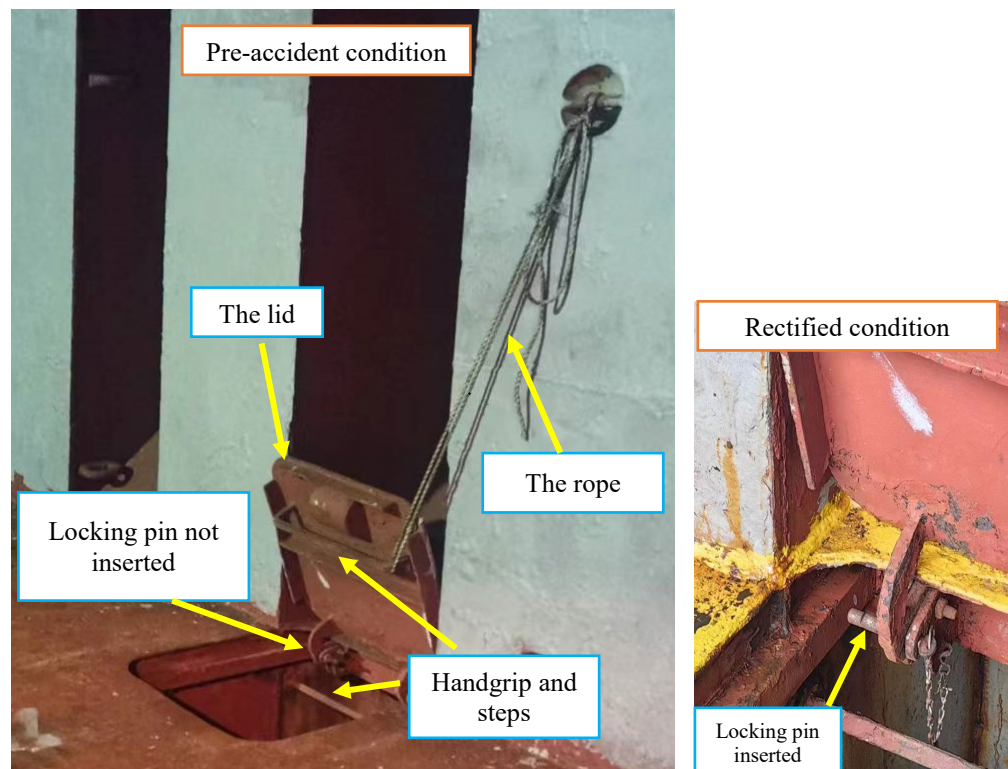


Figure 5: Condition of lid of *the access manhole* (pre-accident and rectified)

Toolbox meeting and risk assessment

- 4.23 Section 1.2.5 of *the Code* states that a toolbox meeting and risk assessment should be carried out onboard before the work commences, including a clear understanding and awareness of any hazards and their associated risks and taking appropriate control measures to eliminate the risks.

- 4.24 Section 4.2.1 of SMP-09⁵ requires that the hazards to personnel safety including slipping and falling should be identified prior to commence those work. Sections 4.3.1 and 4.3.2 of SMP-09 requires that the Master should organize department head (deck/engine) and the crew in charge of operations to assess the identified risks and to take appropriate control measures to respond the risks.
- 4.25 According to the record of risk assessment, the risks of falling for “tween deck hold cleaning” had been assessed before work commenced on the day of the accident, and associated control measures were required to maintain during work, such as keeping safe distance to tween deck’s opened hatch and manning or closing the manhole. However, no evidence showed that the crew members had joined the toolbox meeting and taken preventive actions to prevent falling from height. In addition, the C/E did not conduct risk assessment before entering *the hold* to inspect *the systems*.
- 4.26 The investigation revealed that the crew members of *the vessel* failed to comply with the requirements of *the Code* and shipboard SMS to conduct toolbox meeting before work and implement the required control measures during work. The C/E also failed to comply with the requirements of *the Code* and shipboard SMS to conduct a risk assessment for his inspection work in *the hold*.

Shipboard training and safety awareness

- 4.27 Section 5.1 of the SMP-2⁶ stipulates that SMS familiarization training for crew members including shipboard safety procedures and instructions should be included in the shipboard training. Section 2(1) of SMI-1.49⁷ requires to wear personal safety protection equipment when working in cargo holds. Section 4.6.2 of SMP-09 requires that the master should keep supervising the implementation of preventive measures.

⁵ Shipboard Safe Management Procedure (SMP) for Risk Assessment and Development and Implementation of Preventive Actions.

⁶ Shipboard Safe Management Procedure (SMP) for Ashore and On Board Training.

⁷ Shipboard Safe Management Instruction (SMI) for Ship’s Cargo Holds Cleaning.

4.28 By comparing the shipboard training records before the accident and paragraphs 4.18, 4.22, 4.26 and 4.27, it could be deduced that the crew members were not familiar with SMS safety procedures for conducting risk assessment and toolbox meeting, supervising the implementation of preventive measures, wearing appropriate personal safety protection equipment. Therefore, the shipboard safety training was ineffective. The investigation also revealed that the C/E lacked safety awareness of the risks of his work in *the hold*.

5. Conclusions

- 5.1 On 7 April 2023, *the vessel* departed from the port of Kolkata, India in ballast condition to *the loading port* for loading the cargo of wood pulp.
- 5.2 At 1345 hours on 19 April 2023, *the vessel* arrived at the Morong anchorage and dropped her anchor at position 01° 54.2' N, 101° 50.8' E while waiting for berth. The deck crew members and the 2/E, led by the C/O, opened the hatch covers and tween deck hatch pontoons of *the hold* and carried out painting work for the upper part of *the hold's* bulkhead.
- 5.3 At about 1620 hours, the 2/E observed that the C/E entered *the hold* alone to inspect *the systems* in *the hold* as usual. Soon after, the 2/E suddenly heard screaming followed by a sound of an object hitting heavily against *the tank top*. The 2/E immediately stopped his work and found the C/E lying unconsciously on *the tank top* near the vertical ladder just under *the access manhole*. The 2/E reported the accident to the C/O. The C/O immediately reported to the Master for help. At 1623 hours, the Master urgently organized crew members of *the vessel* to rescue the C/E who was found serious bleeding on his head with no vital signs. The Master reported the accident to *the company* and the local agent for seeking urgent medical assistance. At 0045 hours on 20 April 2023 the C/E was transferred to the rescue boat. At 0400 hours, the C/E was declared dead by the doctor upon arrival at the shore hospital.
- 5.4 The investigation revealed that the contributory factors leading to the accident were as follows:
- (a) the C/E failed to comply with the requirements of *the Code* to seek permission and take suitable control measures for safe entry to *the hold*;
 - (b) the crew members of *the vessel* failed to follow the requirements of *the Code* to secure the lid properly and use warning signs to indicate the hazard of falling from the vicinity of *the access manhole*;
 - (c) the crew members of *the vessel* failed to comply with the

requirement of *the Code* and shipboard SMS to conduct a toolbox meeting before work and implement the required control measures during work, and the C/E did not conduct a risk assessment for his inspection work in *the hold*.;

- (d) the shipboard safety training, in particular on conducting risk assessment and toolbox meeting, supervising the implementation of preventive measures, wearing appropriate personal safety protection equipment, was ineffective; and
- (e) the C/E lacked safety awareness of the risks of his inspection work in *the hold*.

6. Recommendations

- 6.1 The management company should issue a circular informing all masters, officers and crew members of its fleet of the investigation findings and lessons learnt from this accident to:
- (a) strictly follow the requirements of *the Code* for the safe entry to cargo holds, including seeking permission from the responsible ship's officer before entry and taking suitable control measures during work;
 - (b) strictly follow the requirements of *the Code* to secure manhole's lid properly and use warning signs to indicate the hazard of falling from the vicinity of any manhole and opening;
 - (c) strictly follow the requirements of *the Code* and shipboard SMS to conduct toolbox meeting and risk assessment before work; and
 - (d) enhance shipboard training to familiarize with safety procedures for working in the cargo holds, wearing appropriate personal safety protection equipment and improving crew's safety awareness of any hazards of falling.
- 6.2 The management company should conduct an internal audit on board *the vessel* to ensure crew members to strictly follow *the Code* and shipboard SMS to conduct risk assessment and toolbox meeting on board, and ensure shipboard training to cover the safety requirements of working in cargo holds.
- 6.3 The Administration should conduct an additional audit on *the Company* to ensure that the company and shipboard SMS meet the requirements of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (ISM Code) in particular sections 6, 7 and 9⁸.
- 6.4 A Hong Kong Merchant Shipping Information Note is to be issued to promulgate the lessons learnt from this accident.

⁸ Section 6 – Resources and Personnel; Section 7 – Shipboard Operations; and Section 9 – Reports and Analysis of Non-conformities, Accidents and Hazardous Occurrences.

7. Submission

- 7.1 The draft investigation report, in its entirety, was sent to *the Company* and the Master of *the vessel* for comments.
- 7.2 By the end of the consultation, there was no comment received from the above-mentioned parties.