Report of investigation into the fatal accident on board the Hong Kong registered bulk carrier "*Simon Brother*" at Kupiano, Papua New Guinea on 27 March 2020

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

7 July 2021

Purpose of Investigation

The purpose of this investigation, conducted by the Marine Accident Investigation Branch (MAIB) of Marine Department, is to determine the circumstances and the causes of the incident with the aim of enhancing the safety of life at sea and avoiding similar incidents 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 23 February 2020, the Hong Kong registered bulk carrier "Simon Brother" (*the vessel)* anchored at port Kupiano, Papua New Guinea for loading logs.

On 19 March 2020, Nos. 1, 2 and 3 cargo holds were fully loaded and closed. On 26 March 2020, a barge loaded with logs came alongside *the vessel* and 16 stevedores boarded *the vessel* to assist cargo loading in Nos. 4 and 5 cargo holds.

At 0800 hours on 27 March 2020, the foreman of the stevedores (*the foreman*) gathered all stevedores to assign them loading duties. Two stevedores failed to report duty and *the foreman* immediately requested Chief Officer to assist searching. Afterwards, the crew accompanied the stevedores commenced searching on board *the vessel*.

A stevedore saw No. 2 cargo hold forward access hatch (*the access hatch*) was opened and found the two missing stevedores lying on the logs inside the cargo hold. A rescue team was organized and two unconscious stevedores were taken out. Although first aid treatment applied to them, they did not show any vital signs. They were declared dead on the same day.

The investigation revealed that the main contributory factors causing the accident were lack of safety awareness and supervision of the stevedores, and failure of the stevedores to follow safety requirements of enclosed space entry to the cargo hold for unknown reasons without authorization. Failure to lock *the access hatch* to prevent unauthorized entry, and insufficient measures to control or monitor *the access hatch* also contributed to the accident.

The investigation also found out that *the vessel* failed to display proper marking on *the access hatch* as the entrance to a dangerous space.

1. Description of the vessel

Ship name	:	*Simon Brother* (Figure 1)
Flag	:	Hong Kong, China
Port of registry	:	Hong Kong
IMO number	:	9237383
Type	:	Bulk carrier
Year built, shipyard	:	2000, Imabari Shipbuilding Co., LTD. Imarbari, Japan
Gross tonnage	:	16,963
Net tonnage	:	10,498
Summer deadweight	:	28,463 tonnes
Length overall	:	161.21 metres
Breadth	:	27.2 metres
Engine power, type	:	5,850 kW, MAN B&W 6S42MC
Classification society	:	Nippon Kaiji Kyokai
Registered owner	:	Hong Kong YamTai Investment Co., Limited
Management company	:	Shenzhen Shekou Shipping & Transportation Co., LTD

Figure 1 *The vessel*

2. Sources of evidence

2.1 The information provided by the crew and the management company of *the vessel* (the Company).

3. Outline of events

(All times were local time UTC +10 hours)

3.1 At 0820 hours on 23 February 2020, *the vessel* arrived and anchored in Kupiano, Papua New Guinea for loading logs.

3.2 The cargo loading in midstream commenced at 2020 hours on 6 March 2020. On 19 March 2020, Nos.1, 2 and 3 cargo holds were fully loaded. Subsequently, the crew closed Nos.1, 2 and 3 cargo hold hatch covers and the entrance accesses.

3.3 On 26 March 2020 around 1200 hours, a barge with logs came alongside *the vessel* to load the remaining Nos.4 and 5 cargo holds of *the vessel*. A total of 16 stevedores from the barge boarded *the vessel* to assist cargo loading. Loading commenced at 1240 hours and suspended at 1600 hours due to heavy rain. The rain became heavier and made the surface of the decks and logs slippery. Considered the unsafe working environment, the stevedores suspended the cargo loading at night on 26 March 2020. The stevedores took rest outside the accommodation and in the tally room of *the vessel*.

3.4 On 27 March 2020 at 0800 hours, *the foreman* assembled all stevedores to assign them loading duties. As two of the stevedores (stevedores A and B) failed to report duty, *the foreman* immediately requested the Chief Officer to provide searching assistance. Afterwards, the crew accompanied the stevedores to search for stevedores A and B onboard *the vessel*.

3.5 At 0820 hours, a stevedore noticed *the access hatch* was opened. Through *the access hatch*, he saw stevedores A and B lying on the logs inside the cargo hold. He shouted at them but they did not respond. He then informed the findings to the duty able bodied seaman (AB) who relayed the message to the Chief Officer through his portable radio.

3.6 The Chief Officer sounded the emergency alarm of *the vessel* to muster the crew for a rescue operation. To facilitate rescue operation, the crew opened the No.2 cargo hold hatch cover and switched on the cargo hold blower to air the cargo hold further.

3.7 At 0830 hours, a rescue team was organized. Two crew donned self-contained breathing apparatus (SCBA) and climbed down the vertical ladder of *the access hatch* to rescue stevedores A and B. (Figure 2)

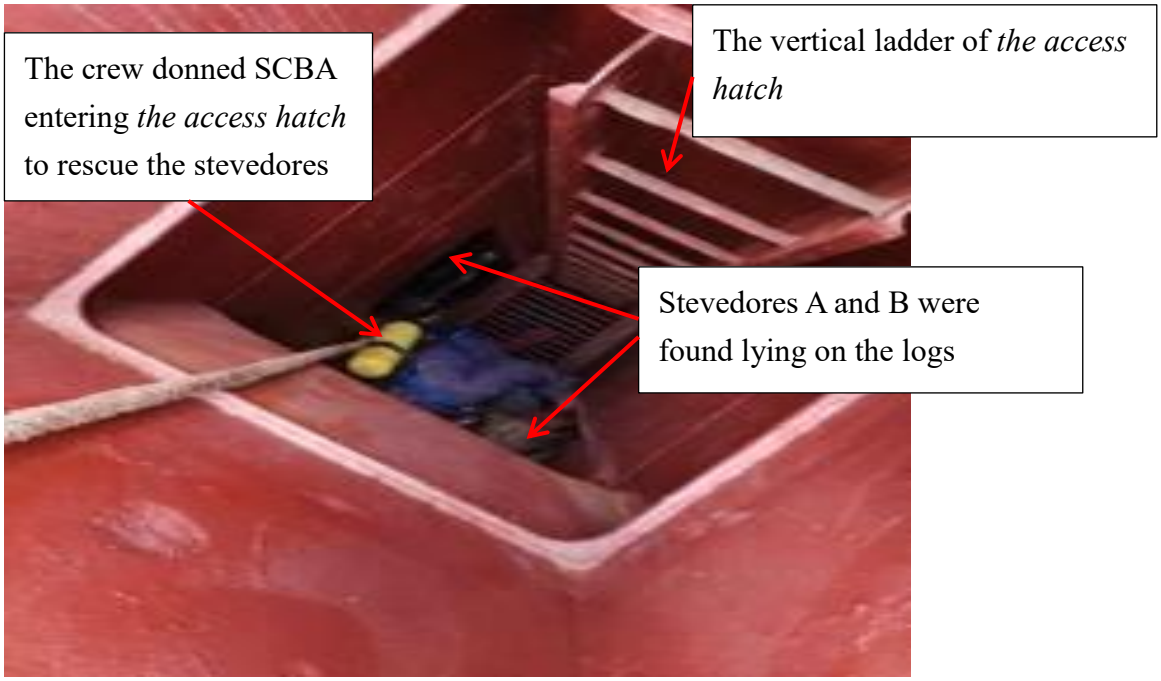

Figure 2 The crew donned SCBA to rescue stevedores A and B

3.8 Stevedores A and B were rescued from the cargo hold at 0846 hours and 0852 hours respectively. Despite both of stevedores A and B did not show any vital signs after being rescued, the Chief Officer still applied first aid treatment to them immediately, but in vain. They were declared dead on the same day.

3.9 At 1040 hours, police officers boarded *the vessel* to investigate the accident.

3.10 At 1150 hours, the two deceased were landed ashore.

4. Analysis

Certification, training and experience

4.1 The statutory trading certificates of *the vessel* were valid and in order. *The vessel* was manned by 23 crew including the Master.

4.2 The Master held a valid Class 1 Licence of the Deck Officer issued by the Hong Kong Marine Department (HKMD). He had worked in the Company for about 17 years and about 7 years' experience as master.

4.3 The Chief Officer held a valid Class 2 Licence of the Deck Officer issued by the HKMD. He had worked in the Company for about 10 years and about 2 years' experience as chief officer.

4.4 There was no abnormality noted with regard to the certification and experience of the crew concerned.

Stevedores

4.5 The stevedores were employed by a local stevedore company. There was no record of the relevant training of the stevedores working onboard.

Weather and sea conditions

4.6 On the day of the accident, the weather was partly cloudy with south-westerly wind of Beaufort Wind Scale force 3. The sea was slight and the visibility was about 7 nautical miles. Weather and sea conditions should not be considered as the contributory factors to the accident.

Fatigue and alcohol

4.7 There was no evidence to show that neither the crew nor the stevedores onboard, suffered from fatigue at work or alcohol.

The death of stevedores A and B

4.8 According to International Maritime Solid Bulk Cargoes Code (IMSBC Code), logs transported in bulk are liable to cause oxygen depletion and increase of carbon dioxide in the cargo hold and adjacent spaces. IMSBC Code also states that personnel should not enter such cargo hold until test had been carried out to establish the oxygen level at 21%.

4.9 No. 2 cargo hold was fully loaded with logs. The hatch cover and *the access hatch* had been closed since 19 March 2020. It was likely that oxygen had been depleted and carbon dioxide had also been accumulated inside the cargo hold. Stevedores A and B were found at a location about 3.7 meters under *the access hatch.* (Figure 3)

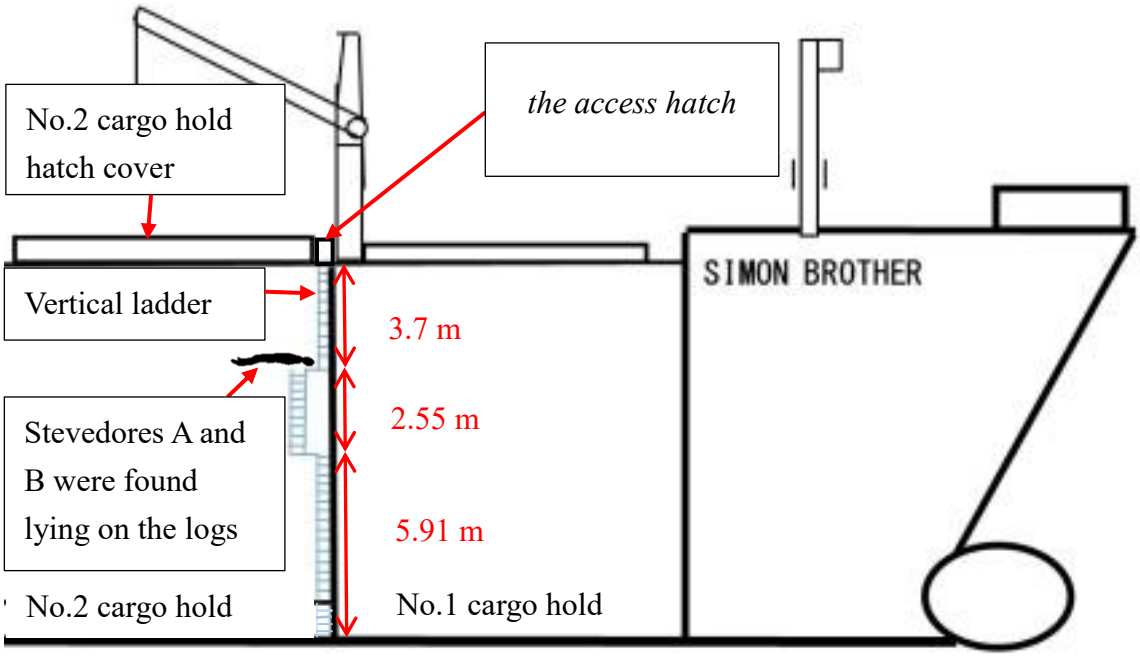

Figure 3 No.2 cargo hold forward access and vertical ladders

4.10 To prepare for the enclosed space entry and rescue, the crew opened the cargo hold hatch cover and switched on the blower of No.2 cargo hold. The oxygen level then measured at scene by the Third Officer was less than 19%. It may be inferred that when the accident happened the oxygen level of the scene would be much lower and ventilation through *the access hatch* alone was unlikely adequate.

4.11 Stevedores A and B did not follow the shipboard enclosed space entry procedures and entered No.2 cargo hold without authorization from ship officers. Eventually, stevedores A and B were killed by the oxygen depletion and high carbon dioxide concentration resulting in this fatal accident. This indicated that the stevedores were lack of safety awareness of enclosed space entry.

Control measures against unauthorized person entry

4.12 Paragraph 15.1.8 of the Code of Safe Working Practices for Merchant Seafarers (the Code)[1] requires that all the entrances to unattended dangerous spaces on a ship should be kept locked or secured against entry and any hatches to readily accessible enclosed spaces should be marked as the entrance to a dangerous space.

4.13 The enclosed No.2 cargo hold loaded with logs was an unattended dangerous space which required all entrance accesses to be properly locked or secured against unauthorized entry. The entrance accesses should also be marked as the entrance to dangerous space according to the Code.

4.14 Instead of displaying the marking as the entrance to dangerous space, *the access hatch* only maintained marking "Restricted Area Authorized", (Figure 4) which did not fully meet the requirement of the Code.

4.15 On the other hand to enhance ship security, the ship security plan of *the vessel* that was approved according to the ISPS Code[2] Section 9 "Ship Security Plan" had identified that all cargo hold access hatches were restricted areas after security assessment by the Company. The Company considered that unauthorized cargo hold entry through access hatches would impose possible security threats and therefore required entrance control.

4.16 The investigation revealed that *the access hatch* was simply locked with cleats for weathertightness but no preventive device fitted for unauthorized entry. (Figure 4)

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[1] Section 4 of Cap. 478M "Merchant Shipping (Seafarers) (Code of Safe Working Practices) Regulation" refers.

[2] The International Ship and Port Facility Security (ISPS) Code was enforced by the Merchant Shipping (Security of Ships and Port Facilities) Ordinance, Cap. 582 and its Rule effective on 1 July 2004.

Figure 4 *The access hatch*

4.17 Despite *the access hatch* was marked with "Restricted Area Authorized", stevedores A and B might be unaware of the associated risk entering such restricted area. Hence, they disregarded the warning notice and entered No.2 cargo hold without authorization. It indicated that the crew did not take reasonable control measures to secure and to prevent unauthorized entry.

4.18 Such measures may include assessing, controlling and maintaining the following: i) stevedores' self-discipline and willingness in compliance with *the vessel*'s requirements, ii) effective communication in routine meeting with stevedores on the hazards of entering cargo holds, and iii) effective control of stevedores to prevent them from loitering onboard, etc. In fact, sealing the assess hatch covers with padlock might be an effective method to prevent unauthorized entry, but it was not done.

4.19 As nobody including *the foreman* knew stevedores A and B entered the cargo hold after the loading was suspended, it was deduced that their entering was not for cargo operation but for unknown reasons.

Supervision of the stevedores

4.20 The Master of *the vessel* alleged that the stevedores had been briefed verbally on the safety requirements of *the vessel.* He also informed the stevedores that the tally room and the area outside the accommodation were the designated assembly area for them. However, the stevedores were not self-disciplined and disregarded the safety requirements onboard, especially not to enter enclosed space or confined space.

4.21 *The foreman* failed to notice the missing of stevedores A & B when loading was suspended at night on 26 March 2020. It was apparent that *the foreman* did not adequately and effectively supervise the stevedores nor control their loitering onboard.

4.22 Nevertheless, according to Requirement 7 "Ship Security" of ISPS Code, *the vessel* was required to identify and take preventive measures to control access to *the vessel*, monitor restricted areas to ensure that only authorized persons have access, and monitor of deck areas, etc.

4.23 As such, in case *the vessel* had taken sufficient measures to control or monitor *the access hatch*, the unauthorized entrance of the stevedores A and B would have been avoided.

Shipboard procedures

4.24 After the accident, the Company had established safety instructions "Warning of safety operation onboard by stevedores" in the safety management system (SMS) of *the vessel* for the crew to follow. The instruction requires Master to ensure all stevedores onboard understood the safety requirements and prohibit unauthorized entry of enclosed space or confined space.

5. Conclusions

5.1 On 27 March 2020, a fatal accident happened onboard *the vessel* anchoring at Kupiano, Papua New Guinea for loading logs. In the morning on 27 March 2020, two stevedores who stayed overnight onboard to assist loading logs were found missing. *The foreman* immediately requested the Chief Officer to provide assistance for searching. Two missing stevedores were later found lying on the logs inside No. 2 cargo hold. They were rescued by the shipboard rescue team. Although first aid treatment immediately applied, both stevedores A and B were declared dead before noon on the same day.

5.2 The investigation revealed that the main contributory factors causing the accident were as follows :

(a) lack of safety awareness and supervision of the stevedores, and failure of the stevedores to follow safety requirements of enclosed space entry to the enclosed cargo hold for unknown reasons without authorization; and

(b) failure to lock *the access hatch* to prevent unauthorized entry according to the Code and insufficient measures to control or monitor *the access hatch* according to ISPS Code.

5.3 The investigation also found out that *the vessel* failed to display proper marking on *the access hatch* as the entrance to a dangerous space according to the Code.

6. Recommendations

6.1 The management company of *the vessel* should issue circulars informing all masters, officers and crew of its fleet of the findings of the investigation and lessons learnt from this accident, and instruct them to :

(a) enhance the communication with the stevedore company regarding safe operation onboard;

(b) enhance monitoring restricted areas and supervising cargo handling according to ISPS Code; and

(c) follow the Code, to lock all entrances to all unattended dangerous spaces against unauthorized entry, and mark the entrances to dangerous spaces as applicable if they were readily accessible.

6.2 The Quality Assurance Section of Marine Department should consider to conduct verifications on the implementation of SMS of the management company and *the vessel*.

6.3 A Hong Kong Merchant Shipping Information Note is to be issued to promulgate the lessons learnt from this accident.

7. Submission

7.1 The draft investigation report, in its entirety, was sent to the following parties for their comments :

(a) the management company and the Master of *the vessel*;

(b) the stevedore company; and

(c) the Quality Assurance Section of Marine Department.

7.2 By the end of the consultation, there was no comment received from the above mentioned parties.