Report of investigation into the fatal accident on board Hong Kong registered bulk carrier "*CSSC He Mei*" in position 25º15'.50 N, 120º 41'.90 E on 21 November 2020

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

04 January 2022

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 21 November 2020 at about 0915 hours, a fatal accident happened to an able seafarer deck (AB1) when Hong Kong registered bulk carrier *CSSC He Mei* (*the vessel*) was en route in ballast condition from Xiamen, China to her loading port in Abbot Point, Australia.

After a toolbox talk on the cargo hold (C/H) cleaning work on the morning of 21 November 2020, six crew members, including AB1 led by the Bosun, commenced the cleaning work. The Bosun as assisted by an ordinary seaman removed a bolted cover of an opening on the cross deck at the aft of the No. 2 C/H to allow a fire hose passing through it for C/H water washing. After removing the cover, the Bosun left and the ordinary seaman went down to the No. 2 C/H for water washing using a fire hose inside.

When AB1 was alone washing the aft end hatch coaming of the No. 2 C/H on the cross deck by using fire hose, he stepped into the opening accidently and fell to the bottom of No. 2 C/H. Although an emergency rescue team was organized immediately and first aid treatment was applied to AB1, he was declared dead on board at about 1000 hours.

The investigation revealed that AB1 lost the situation awareness without staying alert to slips, trips, and falls during working. The opening was not fenced off to avoid falling leading to the accident eventually. The investigation also considered that the toolbox talk was not carried out thoroughly according to the shipboard Safety Management System (SMS), thus contributing to the death of AB1.

1. Description of the vessel

Ship name	:	*CSSC He Mei* (Figure 1)
Flag	:	Hong Kong, China
Port of registry	:	Hong Kong
IMO number	:	9830070
Type	:	Bulk carrier
Year built, shipyard	:	2019, Chengxi Shipyard, China
Gross tonnage	:	44,153
Net tonnage	:	27,609
Summer deadweight	:	81,522.6 tonnes
Length overall	:	229 metres
Breadth	:	32.26 metres
Engine power, type	:	9,930 kW, MAN-B&W 6S60ME
Classification society	:	American Bureau of Shipping
Registered owner	:	CP Hangzhou Shipping S.A.
Management company	:	Wilhelmsen Ship Management Singapore Pte Ltd.

Figure 1 *The vessel*

2. Sources of evidence

2.1 Information provided by the crew and the management company of *the vessel*

3. Outline of events

(All times were local time UTC + 8 hours)

3.1 At 1442 hours on 19 November 2020, after discharging a cargo of soya bean in Quanzhou, China, *the vessel* departed Quanzhou and proceeded to the anchorage off Xiamen for bunkering.

3.2 At 2036 hours on 20 November 2020, after bunkering, *the vessel* commenced her next voyage in ballast condition to Abbott Point, Australia to load coal in bulk.

3.3 At 0710 hours on 21 November 2020, the Bosun went to see the C/O on the bridge to receive work orders for the day. Considering the cargo of coal to be loaded in the next port, the Chief Officer (C/O) instructed the Bosun to lead six crew members to clean the Nos. 1, 2 and 3 C/Hs. The C/O passed the Bosun a form (DE-78) of the shipboard SMS for toolbox talk before cleaning work.

3.4 At about 0745 hours, a toolbox talk was hosted by the Bosun to brief his team comprising three able seafarers deck (AB1, AB2 and AB3), two ordinary seamen (OS1 and OS2) and a cadet of their duties and safety issues of the cleaning work according to the DE-78.

3.5 After the talk, the team as led by Bosun prepared the required tools and put on the appropriate personal protective equipment including helmets, gloves, goggles, raincoats etc. for the cleaning work. The cleaning work was C/H washing by using fire hoses.

3.6 To facilitate the lowering of fire hose to the bottom of the No. 2 C/H for washing, the Bosun assisted by OS1 removed a bolted cover (residue cover) of size 600 mm x 800 mm on the cross deck behind the aft end hatch coaming of the No. 2 C/H. AB1 was nearby handling the work of ranging out fire hoses on the cross deck and was aware that the Bosun and OS1 were removing the residue cover.

3.7 OS1 then went down to the No. 2 C/H by the access hatch for the cleaning work. AB1 as assisted by the Bosun on the port side main deck used

another fire hose to wash the forward and aft side-rails of the No. 2 C/H hatch cover. (Figure 2)

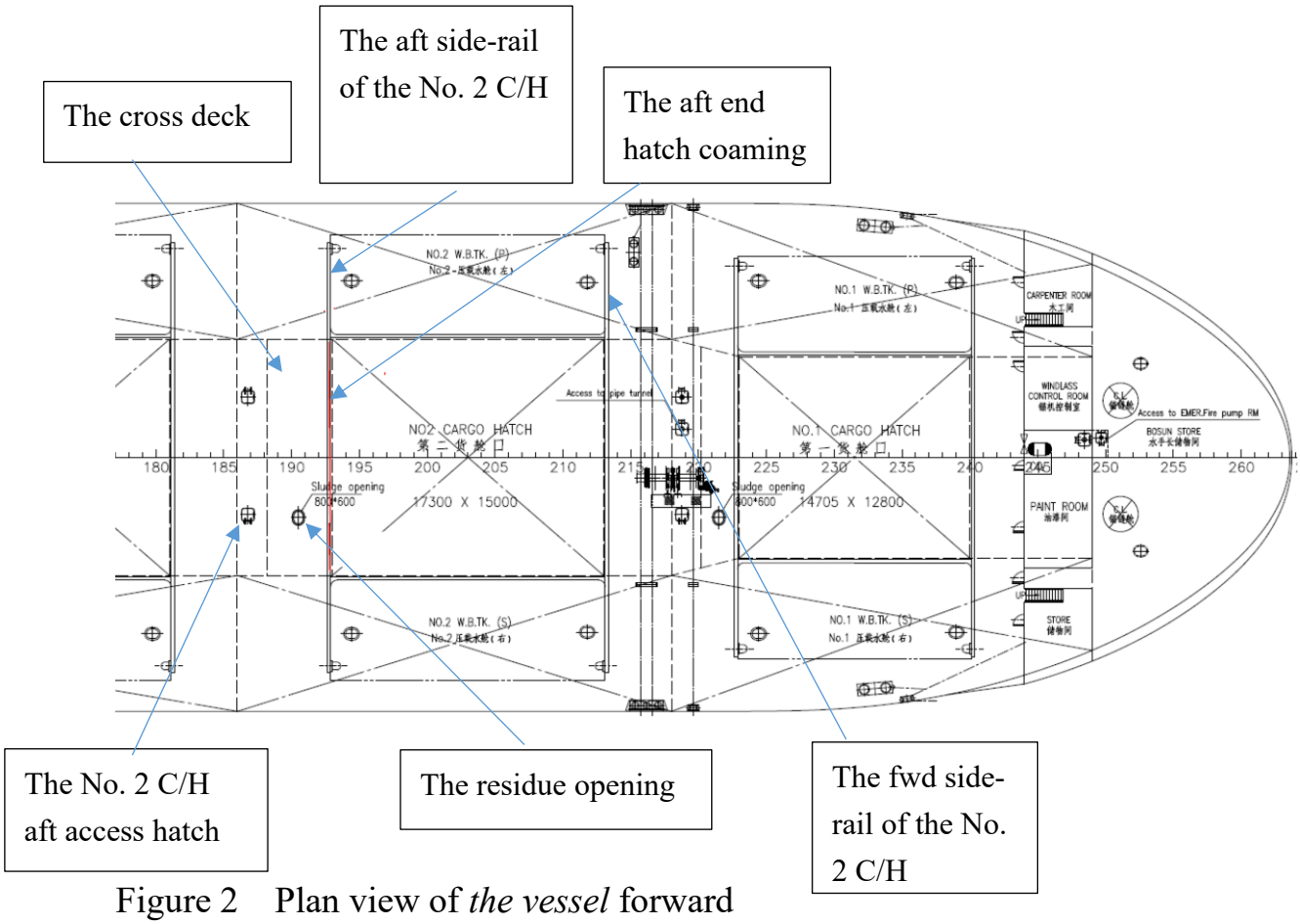

Figure 2 Plan view of *the vessel* forward

3.8 After washing the side-rails, the Bosun left and went down to the No. 1 C/H together with AB3 for the cleaning work inside. AB1 alone continued washing the port side longitudinal hatch coaming from forward to the aft end of the No. 2 C/H. Upon completion, AB1 also had to wash the aft end hatch coaming of the No. 2 C/H.

3.9 At 0915 hours, when OS1 was washing in the forward part of the No. 2 C/H, he heard something at his back falling to the bottom of the hold. He turned back and found AB1 lying unconsciously on the bottom plate at the aft end.

3.10 OS1 immediately informed the bridge of the incident through his portable radiotelephone. The duty officer on the bridge recorded *the vessel's* position when the incident happened was at 25º15'.50 N, 120º 41'.90 E. When the C/O in the ship's office and the Bosun in the No. 1 C/H heard

the incident from OS1 through their portable radiotelephones, they immediately went to the No. 2 C/H to render assistance and found that AB1 only had a weak pulse and slow breathing.

3.11 The Master summoned a rescue team to rescue AB1. However, at about 1000 hours, the AB1 had no vital signs and was declared dead on board. At about 1050 hours, the AB1 was shifted out of the No. 2 C/H.

3.12 The master informed the management company of the situation of the AB1, and he was instructed to sail back to Xiamen for investigation by the local authority and to land the body of AB1 ashore.

4. Analysis

Certification and experience

4.1 The Master was the first time to serve the company and joined *the vessel* on 13 November 2020. He had about 9 years of experience as a master. He possessed a Class 1 Certificate of Competency issued by China valid until 4 September 2024 and held a valid Class 1 Licence (Deck Officer) issued by the Hong Kong Marine Department (HKMD).

4.2 The C/O served the company for more than one year. He had more than one year of experience as chief officer and joined *the vessel* on 13 November 2020. He possessed a Class 2 Certificate of Competency issued by China valid until 17 September 2023 and held a valid Class 2 Licence (Deck Officer) issued by HKMD.

4.3 The Bosun had about one year of experience as a bosun and joined *the vessel* on 13 November 2020. He possessed a valid certificate of proficiency issued by China as an able seafarer deck on ships of 500 gross tonnage or more. He signed on *the vessel* as a bosun on 13 November 2020.

4.4 AB1 had served the position as an able seafarer deck for about 8 months. He possessed a valid certificate of proficiency issued by China as an able seafarer deck on ships of 500 gross tonnage or more. He signed on *the vessel* as an able seafarer deck on 13 November 2020.

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

Weather and sea condition

4.6 At the time of the accident, the weather was fair with northeasterly wind force 5 on Beaufort Wind Scale, and the moderate sea condition did not cause obvious rolling and pitching of *the vessel*. The visibility was good. Weather and sea condition should not be the contributing factors to the accident.

Working hours, alcohol, and drugs abuse

4.7 There was no evidence to show that any crew members involved in the accident, including the AB1, suffered from either fatigue at work or abuse of alcohol and drugs.

Cause of death

4.8 The death certificate issued by the local authority in Xiamen, China stated that the death of AB1 was caused by falling from height.

Residue cover bolted to the opening on the cross deck

4.9 *The vessel* was built with seven cargo holds for stowing cargoes in bulk. Each cargo hold was provided with an accessible entrance at forward and aft sides of the cargo hold.

4.10 The No. 2 C/H aft access was located on the cross deck through a booby hatch having a height of 620 mm in conjunction with the access ladders inside leading to the bottom of the cargo hold (Figure 3).

4.11 In the cleaning work, the crew members selected to open the residue opening (a flush type opening) of size 600 mm x 800 mm on the cross deck behind the aft end hatch coaming of the No. 2 C/H for the removal of the residue (Figure 4).

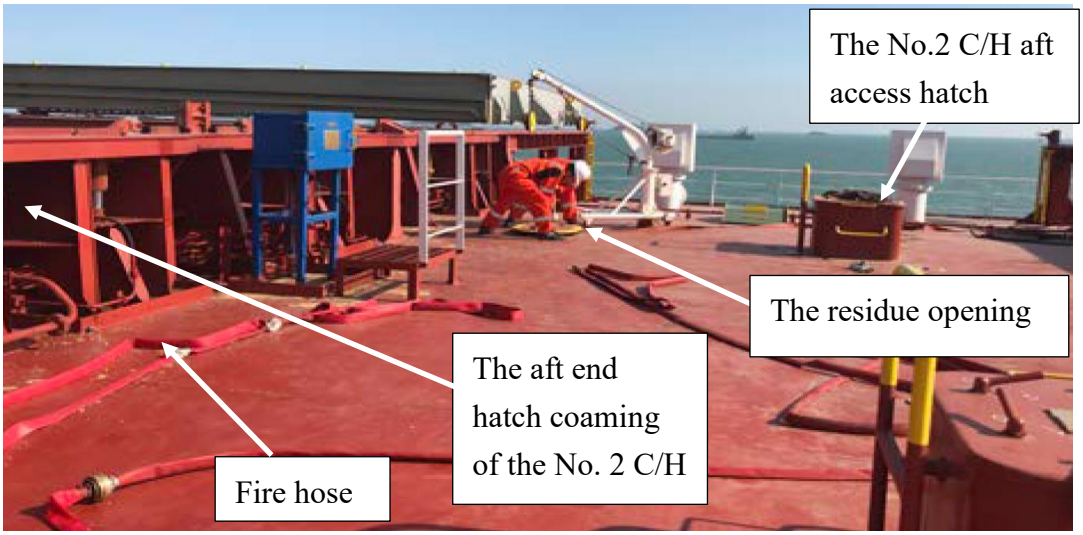

Figure 3 The No.2 C/H aft access hatch on the cross deck

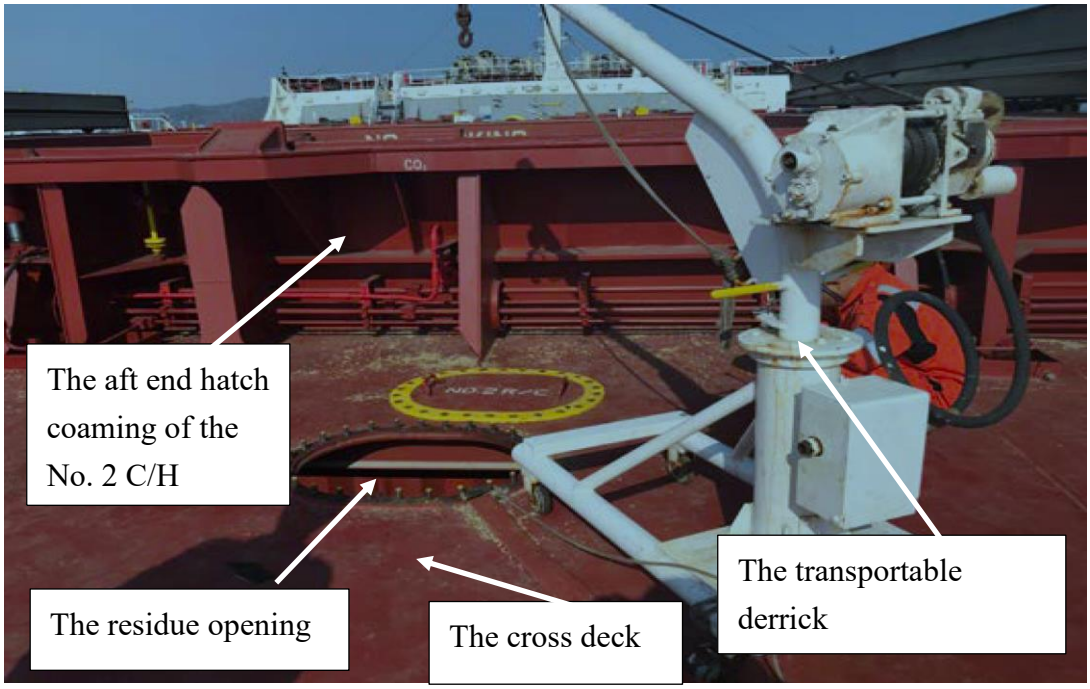

Figure 4 The residue opening and the transportable derrick

4.12 The height between the cargo hold bottom plate and the residue opening was about 19.5 metres without any obstruction in between which greatly facilitated the removal of cargo residue from the hold. The crew members only needed to place a transportable derrick directly above the residue opening to winch up easily the collected residue underneath (Figure 5).

4.13 The size of the residue of opening of 600 mm x 800 mm was big enough to allow a person wearing a self-contained air-breathing apparatus and protective equipment to pass through without obstruction. As such, when AB1 stepped into the residue opening, he would fall straightly down to the cargo hold bottom.

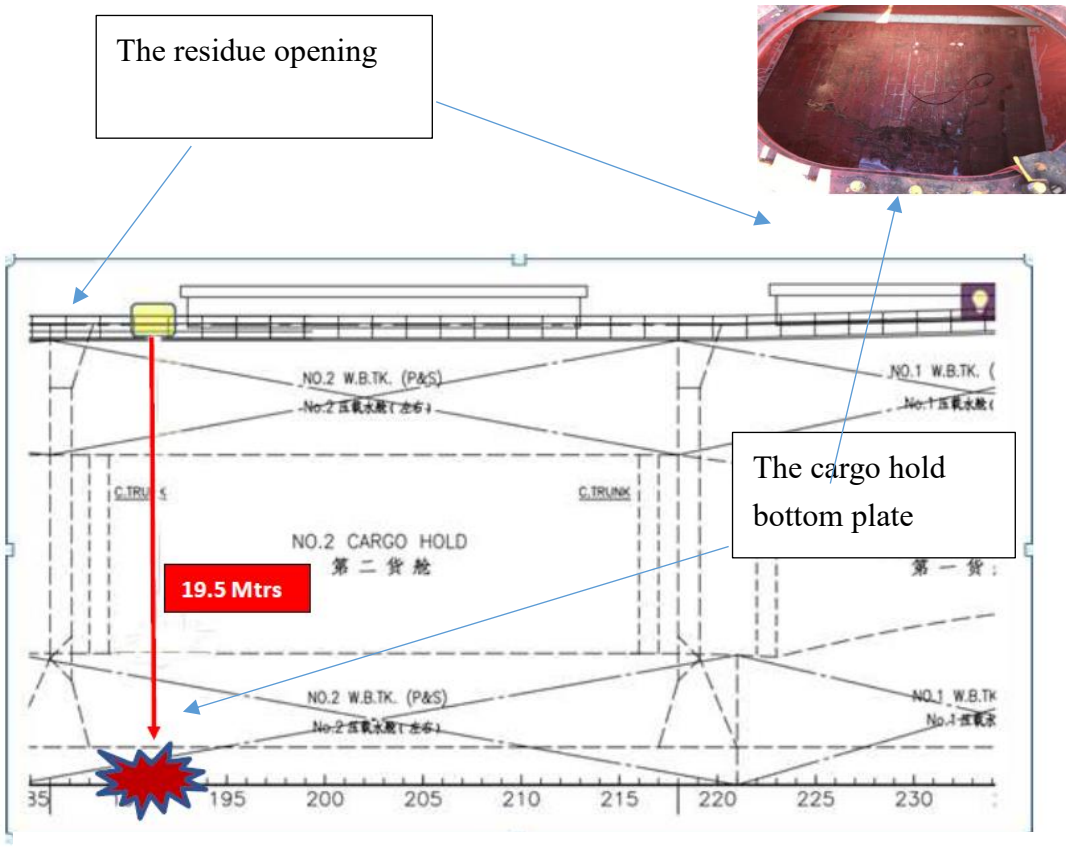

Figure 5 The height between the cargo hold bottom plate and the residue opening

Probable cause of the accident

4.14 After water washing the forward and aft side-rails of the No. 2 C/H hatch cover on the port side, the Bosun went to the No. 1 C/H and allowed AB1 to carry on water washing the port side longitudinal hatch coaming of No. 2 C/H.

4.15 AB1 was working alone and nobody noticed how he fell into the No. 2 C/H. It was reasonable to deduce that AB1 whilst continued washing the aft end hatch coaming of No. 2 C/H by holding a fire hose, he then walked on the cross deck from port to starboard side holding the fire hose. Without noticing the residue opening. AB1 lost the situation awareness and fell to the bottom of No. 2 C/H.

Safety issues when preparing the cleaning work

4.16 Section 11.13.2 of "Code of Safe Working Practices for Merchant

Seafarers",[1] (*the Code*) states that manholes and other deck accesses should be kept closed when not being used; guardrails should be erected and warning signs posted when they are open.

4.17 However, the residue opening was left open during the cleaning work for the fire hose passing through to the cargo hold bottom without any temporary guardrails or fencing or warning signs placed around the residue opening.

4.18 Had the residue opening been secured by temporary guardrails or fencing with intermediate taut wire rail at a sufficient height of more than one metre, AB1 would have been saved from stepping into the opening. Had apparent warning signs been posted around the residue opening, AB1 would have been aware of the opening nearby to avoid the accident.

The toolbox talk

4.19 Before commencing the cleaning work, the Bosun hosted a toolbox talk with six crew members according to DE-78 of the shipboard SMS. The investigation found that the completed DE-78 for the cleaning work in the accident had identified the following:

(a) the applicable hazards of the cleaning work included: slips, trips and falls, working at height, pollution, pressure, machinery/rotating equipment, and manual handling;

(b) the required tools and equipment for the cleaning work included: fire hoses, raincoats, rain shoes, safety gloves, shoes, helmets, suits, goggles, and face masks;

(c) crew members were aware of work plans or procedures;

(d) crew members were aware of their responsibilities;

(e) correct tools or equipment were available;

(f) the worksite was inspected to ensure that all necessary precautions

[1] "Code of Safe Working Practices for Merchant Seafarers" is a publication required to be carried on board Hong Kong ships pursuant to the Merchant Shipping (Seafarers) (Code of Safe Working Practices) Regulation (Cap. 478M).

were in place before the cleaning work;

(g) crew members were aware of hazardous materials assessment and relevant personal protection equipment to be available; and

(h) effective communication, housekeeping and equipment identification were done.

4.20 The completed DE-78 recorded that the talk was conducted by the C/O but the C/O had not attended the talk. It was reasonable to believe that the C/O had identified the hazards involved and filled up DE-78 for giving briefing to the Bosun. The C/O then allowed the Bosun to host the toolbox talk on his behalf.

4.21 The investigation revealed that the toolbox talk had not been carried out thoroughly to ensure that the work plans, safety precautions, and the hazards involved were clearly understood by crew members due to the following findings:

(a) good communication for the work, particularly to achieve look-out for each other, was not established among crew members through the toolbox talk. When the Bosun and OS1 removed the residue cover and were well aware of the falling hazard, they did not highlight the hazard to AB1 who would work in that area;

(b) worksite inspection before commencing the work as required by DE-78 was not carried out cautiously, resulting in the failure of ascertaining the safety of the worksite when the residue cover was removed;

(c) risk control was inadequate after identifying the hazards involved. The hazard of "slips/trips/falls" was identified in the form, but the appropriate tool of temporarily guardrails or fencing or warning signs for placing around the residue opening was not listed in Section "Tools and equipment to be used" of DE-78; and

(d) the work plans were not carefully discussed as crew members were not properly instructed of their duties or responsibilities, particularly in taking care of their safety when moving around. AB1 was assigned to work alone by holding a fire hose on the deck. He was likely subject to slips, trips, and falls by the fire hose and

the deck surface but he was not told of the potential risks.

5. Conclusions

5.1 On 21 November 2020, at about 0915 hours, a fatal accident happened to AB1 in the cleaning work of cargo holds when *the vessel* was en route in ballast condition from Xiamen to her loading port in Abbot Point, Australia.

5.2 After a toolbox talk on the cleaning work of cargo holds on the morning of 21 November 2020, six crew members, including AB1 led by the Bosun commenced the work. The Bosun as assisted by OS1 removed the bolted cover of the residue opening on the cross deck at the aft of the No. 2 C/H in order to facilitate a fire hose to pass through.

5.3 When AB1 was alone washing the aft end hatch coaming of the No. 2 C/H on the cross deck using fire hose, he stepped into the residue opening accidentally and fell to the bottom of No. 2 C/H causing his death.

5.4 The investigation revealed that the main contributing factors to the accident were as follows:

(a) AB1 had lost situation awareness without staying alert to slips, trips, and falls;

(b) the residue opening was kept open for the fire hose passing through in the cleaning work without placing guardrails or warning signs according to *the Code*; and

(c) the toolbox talk had not been carried out thoroughly to ensure that the work plans, safety precautions and hazards were clearly understood by crew members and controlled according to the shipboard SMS.

6. Recommendations

6.1 The management company should issue circulars to inform all masters, officers and crew members of the findings of the investigation and the lessons learnt from this accident and instruct them to ensure that:

(a) guardrails should be erected, or apparent warning signs should be displayed around manholes and other deck accesses when they are open;

(b) appropriate control measures should be implemented corresponding to risk assessment results; and

(c) toolbox talk should be carried out thoroughly to ensure the work plans, safety and hazards involved are clearly understood in accordance with the requirements of SMS.

6.2 A Hong Kong Merchant Shipping Information Note should be issued to promulgate the lessons learnt from the accident.

7. Submission

7.1 The draft investigation reports, in its entirety, was sent to the shipowner, ship management company and the Master of *the vessel* for their comments.

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