Report of investigation into a fatal accident on board the Hong Kong registered container carrier "*Lexa Maersk*" at Guayaquil, Ecuador on 15 January 2023

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

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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 13 January 2023, the Hong Kong registered container carrier "*Lexa Maersk*" (*the vessel*) berthed at the port of Guayaquil, Ecuador for discharging and loading containers.

At 0755 hours on 14 January 2023, *the vessel* discharged all containers and commenced loading containers, including reefer containers. At 2055 hours, eight shore technicians of a local reefer containers repair and maintenance service company (*the service company*) boarded *the vessel* to connect *the vessel*'s power supply to the reefer containers stowed in each of the bays on board.

At 0335 hours on 15 January 2023, the Deck Cadet (*the D/C*) found that stevedores were suddenly rushing to bay 21 when he assisted in a cargo watch on the deck at bay 10. He then followed them and saw a shore technician (*the technician*) lying unconsciously on the top of a twenty-foot container (*the container*) at row 01 tier 04 stowed under the deck in the cargo hold of bay 21 (*the hold*). He reported the accident to the duty Second Officer (*the 2/O*) and the Chief Officer (*the C/O*). Both of them immediately arrived at the scene to check the situation. At 0350 hours, a shore rescue team arrived to examine *the technician* and declared his death at 0355 hours. *The Master* reported the accident to the management company of *the vessel* and the local agent. At 1210 hours, the body of *the technician* was shifted ashore by shore crane.

The investigation identified that the contributory factors leading to the accident were that *the technician* lacked safety awareness of the risk of falling from height while working alone in the vicinity of the opening of the centre hatch cover at bay 21 (*the hatch cover*). The crew failed to follow the requirements of the shipboard safety management system (SMS) to ensure *the technician* wearing appropriate personal protective equipment (PPE) during cargo operation.

The investigation also found that the external communication between shore personnel and the crew was ineffective, i.e. no safety meeting before work, no safety instructions of wearing appropriate PPE during work, no risk assessment and no control measures taken for working aloft, no action taken to close *the hatch cover* as soon as the cargo operation stopped in accordance with the requirements of the "Code of Safe Working Practices

for merchant seafarers" (*the Code*)[1]; and that the internal communication between shore technicians and *the service company* was also ineffective, i.e. no safety instructions and no supervision for the work of the shore technicians on board during the cargo operation.

[1] *The Code* 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).

1. Description of *the vessel*

Ship name	:	*Lexa Maersk* (Figure 1)
Flag	:	Hong Kong, China
Port of registry	:	Hong Kong
IMO number	:	9190767
Type	:	Container Carrier
Year built, shipyard	:	2001, Odense Staalskibs A/S - Munkebo
Gross tonnage	:	50,688
Net tonnage	:	28,350
Length overall	:	265.84 meters
Breadth	:	37.30 meters
Engine power, type	:	45,717 kW, Samsung Man B&W, 10K90MC
Classification society	:	Lloyd's Register (LR)
Registered owner	:	Maersk Shipping Hong Kong Limited
Management company	:	Maersk A/S

Figure 1: *Lexa Maersk*

2. Sources of evidence

2.1 Information provided by the management company of *the vessel* (*the Company*).

3. Outline of events

(All times were local time UTC - 5 hours)

3.1 At 1615 hours on 13 January 2023, *the vessel* berthed at the port of Guayaquil, Ecuador and commenced discharging containers at 1646 hours on the same day.

3.2 At 0755 hours on 14 January 2023, *the vessel* commenced loading containers on board, including reefer containers.

3.3 At 2055 hours, eight shore technicians of *the service company* boarded *the vessel* to connect *the vessel*'s power supply to the reefer containers stowed in each of the bays on board.

3.4 At 0010 hours on 15 January 2023, *the hatch cover* was opened. *The ves*sel commenced loading containers under the deck for *the hold*.

3.5 At 0331 hours, the loading operation for the cargo hold of bay 18 was completed, and a total of 94 forty-foot reefer containers were loaded. There were three tiers of reefer containers stowed on the main deck at bay 18 (Figure 2).

Figure 2: Photo of bays 18 & 21 taken after the accident

3.6 At 0335 hours, *the D/C* found that stevedores on board were suddenly rushing to bay 21 when he assisted in a cargo watch on the deck at bay 10. He followed them and saw *the technician* lying unconsciously on the top of *the container* at row 01 tier 04 stowed under the deck in *the hold* close to the starboard side (Figure 3). He immediately reported the accident to *the 2/O* and *the C/O*.

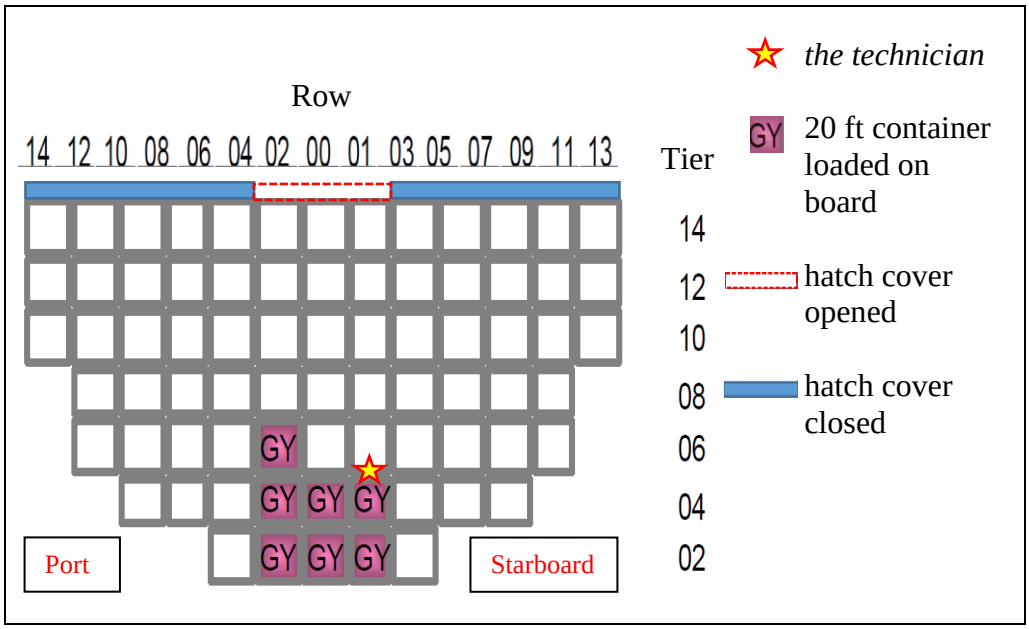

Figure 3: Position of *the technician* at bay 21

3.7 *The 2/O* went to bay 21 and asked the stevedores around who witnessed the accident but in vain. He opened the access hatch to *the hold* and went down with five stevedores to check *the technician*, who was face down lying unconsciously on the top of *the container*.

3.8 *The C/O* and a shore rescue team arrived at the scene at 0340 hours and 0350 hours respectively. At 0355 hours, the shore rescue team declared *the technician* dead. *The Master* reported the accident to *the Company* and the local agent. All personnel left the cargo hold of bay 21 at 0414 hours.

3.9 At 0500 hours, police officers boarded *the vessel* to investigate the accident and interviewed stevedores and technicians on board. The interviews were completed at 0527 hours. There was no eye witness in this accident.

3.10 At 1210 hours, the body of *the technician* was shifted ashore from

the hold with a man-cage by shore crane.

3.11 At 1400 hours, *the vessel* departed the port of Guayaquil with permission granted by the local authority.

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 adequately manned by 25 crew members of multiple nationalities 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 3.5 years of sea experience as a master. He possessed a Class 1 Certificate of Competency issued by the Maritime and Port Authority of Singapore, valid until 8 December 2025.

4.3 *The C/O* had about 8.8 years of sea experience as a chief officer. He possessed a Class 1 Certificate of Competency issued by the Government of the Republic of the Philippines, valid until 30 July 2026.

4.4 *The 2/O* had about 2.3 years of sea experience as a second officer. He possessed a Class 2 Certificate of Competency issued by the Democratic Socialist Republic of Sri Lanka, valid until 23 October 2024.

4.5 The Third Officer had about 2 years of sea experience as a third officer. He possessed a Class 3 Certificate of Competency issued by the Government of the Republic of the Philippines, valid until 06 September 2026.

4.6 *The D/C* had about 4 months of sea experience as a deck cadet.

4.7 The Chief Engineer had about 11 years of sea experience as a chief engineer. He possessed a Class 1 Certificate of Competency issued by the Government of Ukraine, valid until 31 March 2026.

4.8 The Second Engineer had about 2.3 years of sea experience as a second engineer. He possessed a Class 2 Certificate of Competency issued by the Government of the Republic of the Philippines, valid until 19 August 2025.

4.9 The Third Engineer had about 5.5 months of sea experience as a third engineer. He possessed a Class 3 Certificate of Competency issued by the Government of the United Kingdom of Great Britain and Northern Ireland, valid until 23 July 2025.

4.10 The Fourth Engineer had about 11 months of sea experience as a fourth engineer. He possessed a Class 3 Certificate of Competency issued by the Government of India, valid until 19 July 2026.

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

Fatigue, alcohol and drugs abuse

4.12 *The technician* boarded *the vessel* and commenced work at 2055 hours on 14 January 2023. The records of his working hours on board and one day before the accident were unavailable.

4.13 Nine hundred and forty-eight reefer containers were loaded on board in Guayaquil and handled by eight shore technicians. On average, each technician was required to connect over 100 reefer containers to *the vessel*'s power supply.

4.14 At the time of the accident, *the technician* worked alone at bay 18 to connect power supply to 94 reefer containers. From the information collected, it could not be established that *the technician* had signs of work-related fatigue.

4.15 There was also no evidence to show that *the technician* on board suffered from abuse of alcohol and drugs.

Communication between shore technicians and the crew

4.16 Eight shore technicians of *the service company* boarded *the vessel* to connect *the vessel*'s power to the cables of reefer containers loaded on board.

4.17 The shore technicians picked the power cable out of the cable storage box in the reefer containers loaded at the second (2^{nd}) tier or

above on the deck, lowered it onto the deck by a cable picker[2] (Figure 4), and connected it to the power supply of *the vessel* because *the vessel* was not fitted with a lashing bridge.

Figure 4: Photo of a fully extended cable picker reaching the fourth (4th) tier of reefer containers

4.18 The investigation found that no ship-shore safety meeting was held between the crew and supervisors of stevedores or shore technicians before their work on board, and there was no evidence to show that *the service company* or *the vessel* had provided safety instructions to the shore technicians regarding wearing appropriate PPE, risk assessment and control measures for working aloft. There was also no supervisor of *the service company* boarded *the vessel* to monitor the safety of the shore technicians during the cargo operation.

[2] The cable picker is a fiberglass pole of 9 metres long when fully extended. The top part of the pole is heavier as it is made of aluminum, and its hook is used to pick the cable out of the storage box.

4.19 In addition, under normal operation, the shore technicians should stand on the catwalk between bays and extend the cable picker to pick the power cable out of the storage box in the reefer containers loaded on the deck at the 2nd tier or above.

4.20 Nevertheless, the crew were not aware that *the technician* worked near the opening of *the hatch cover* of *the hold*. Concurrently, *the technician* did not inform his work to the crew or *the service company* before working near the opening of *the hold*. No relevant risk assessment was carried out before the work. It was concluded that both the internal communication between the shore technicians and *the service company* as well as the external communication between shore personnel and the crew were ineffective.

Probable cause of the accident

4.21 There was no eye witness in this accident, and the autopsy report of *the technician* was unavailable. Therefore, the probable cause of the accident was based on available information provided by *the Company*.

4.22 In the accident, *the technician* was found with face down lying on the top of *the container* in *the hold* close to the starboard side (Figure 5). The top of *the container* and the hatch coaming of bay 21 was about 13 metres.

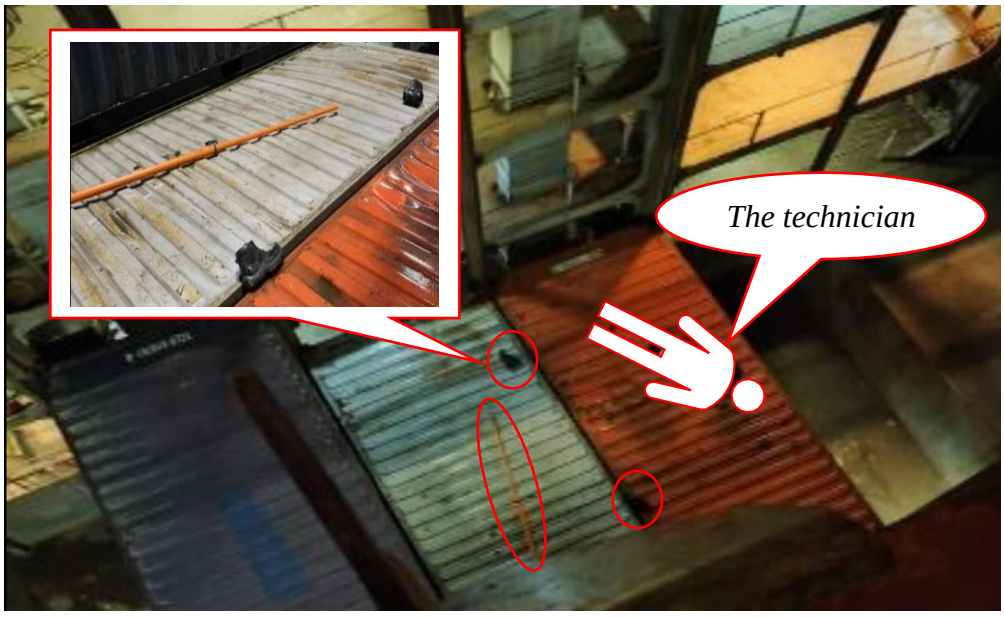

Figure 5: A pair of safety shoes and a partly extended cable picker were found nearby the body of *the technician* adjacent to *the container*

4.23 The investigation found that all reefer containers loaded in bay 18 were connected to *the vessel's* power supply at the time of the accident, except three reefer containers loaded on deck at the centre of tier 86 rows 02, 00 and 01 (*the unplugged reefer containers*), which were located in front of the opening of *the hatch cover* (Figure 6 & 7).

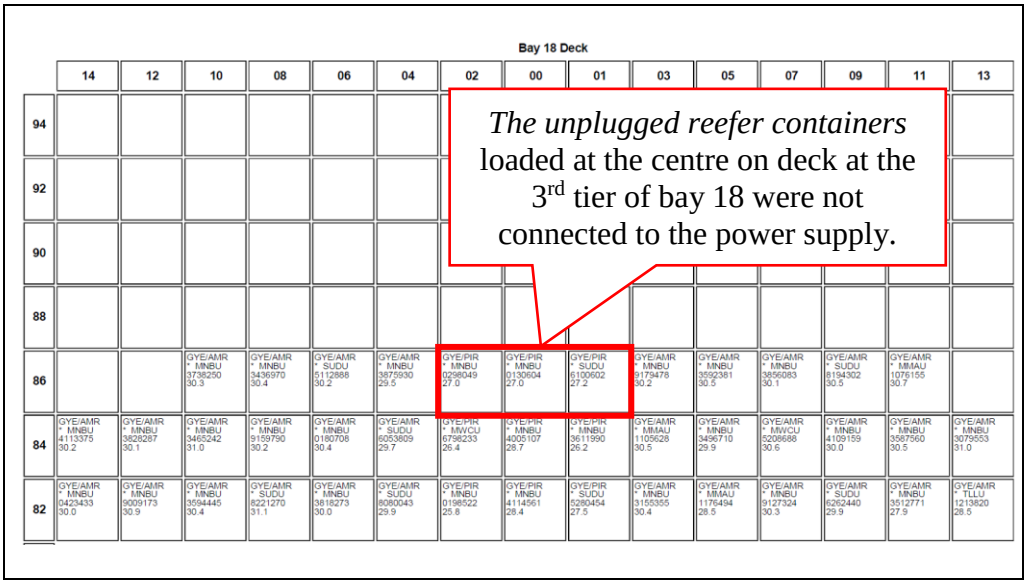

Figure 6: Loading condition on the deck in bay 18

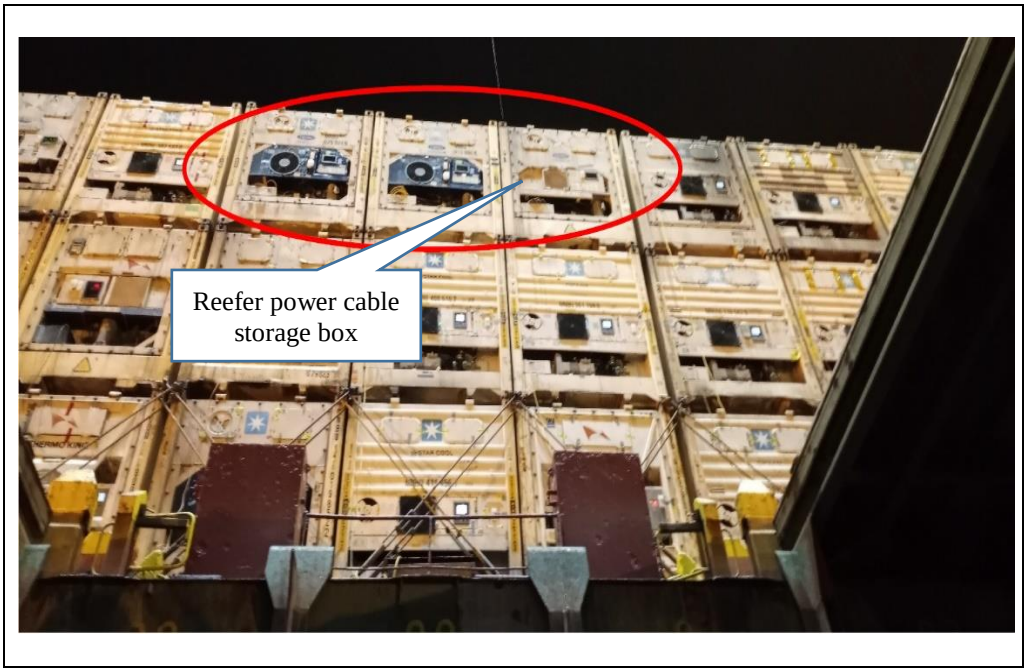

Figure 7: View from inside cargo hold of bay 21 to bay 18 of *the unplugged reefer containers*

4.24 The investigation deduced that *the technician* was working alone on the catwalk between bays 18 and 21 to connect the power cable of *the unplugged reefer containers*. At the time of the accident, he probably walked through an unsafe route to the starboard side hatch cover in bay 21 in order to get a better angle to pick the power cables out of *the unplugged reefer containers* by a partly extended cable picker (Figure 8).

4.25 As *the unplugged reefer containers* were located at the centre positions on the deck at the 3rd tier of bay 18, *the technician* might require to stretch his body close to the opening of *the hatch cover* to pick the cable out of its storage box. As a result, he might lose his balance and fall into *the hold*, causing his death.

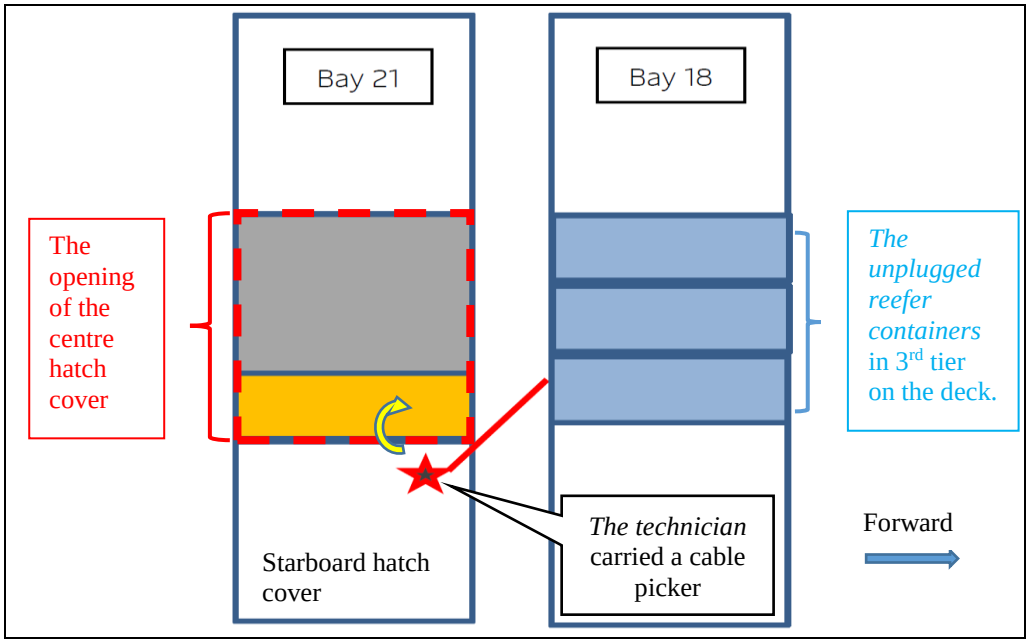

Figure 8: Probable position of *the technician* before falling into *the hold*

Working aloft

4.26 Section 17.1 of *the Code* states that *anyone working in a location where there is a risk of falling may be regarded as working at height. This includes undertaking work inside a tank, near an opening such as a hatch or on a fixed stairway. 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. Depending on the severity of the risk, a permit to work may be required.

4.27 According to paragraphs 4.24 and 4.25 mentioned above, it was deduced that *the technician* worked close to the opening of *the hatch cover* at the height of 13 metres to *the container* loaded in *the hold* without informing the crew and *the service company* of his work.

4.28 Section 17.2.6 of *the Code* states that *personnel working aloft should wear a safety harness with a lifeline or other arresting device at all times*.

4.29 Chapter 3 of the cargo watchkeeping procedure of the shipboard SMS states that *the duty officer is responsible for ensuring that all personnel involved in cargo operations should use appropriate PPE.*

4.30 *The technician*'s safety shoes were found lying on the right-hand side of his body at a distance of about 1.5 metres (Figure 5 refers), and he did not wear a safety helmet and safety harness. According to the information provided by *the Company*, despite the duty crew checked all shore technicians were wearing proper PPE at the gangway during embarkation, the unsafe act of *the technician*, i.e. without wearing of safety harness or other arresting device when working aloft, was not properly monitored by the duty officer through random checks.

4.31 The investigation revealed that the crew failed to follow the requirements of the shipboard SMS to ensure *the technician* wearing appropriate PPE during cargo operation.

4.32 The investigation also found that *the technician* lacked safety awareness of the risk of falling from height while working alone at the starboard hatch cover in the vicinity of the opening of *the hatch cover* of *the hold*.

Weather and light conditions

4.33 The weather was rainy with southwesterly wind of Beaufort Wind

Scale Force 2. There was continuous light rain in the early morning of 15 January 2023. The top of the hatch covers became slippery after rain. If *the technician* walked or worked on the wet hatch cover and near the opening of *the hatch cover* of *the hold*, he might be slipped on the slippery surface and fallen into *the hold*.

4.34 Four floodlights on fore and aft catwalks between bays 18 to 21 and bays 21 to 24 (Figure 2 refers) were in operation with sufficient illumination at the time of the accident. The light condition was not considered to be the contributory factor to the accident.

Catwalk, railings and hatch cover (Figure 9 refers)

4.35 The catwalk and railings between bays 18 and 21 were in sound condition and properly maintained. The catwalk was placed with a layer of anti-slip mat. The railings were found intact, and it could avoid personnel working on the catwalk from accidentally falling into *the hold* when *the hatch cover* was removed.

4.36 The hatch covers of *the hold* are of steel structure and were in sound condition at the time of the accident. Their surfaces had no anti-slip coating or materials added. However, *the technician* might have a chance to trip over by the raised edge of the hatch covers and fall into *the hold* when he was walking near the opening of *the hatch cover*.

4.37 Section 11.6.1 of *the Code* states that the *hatchways that are open for handling cargo or stores, through which persons may fall or on which may trip, should be closed as soon as work stops*.

4.38 However, the investigation revealed that *the hatch cover* was not closed immediately when the cargo operation in bay 21 was temporarily stopped. If *the vessel* and the shore personnel had established good communication to follow the requirements of *the Code* to close *the hatch cover* as soon as cargo operation stops or take suitable control measures against the risk of falling into *the hold*, the accident might have been avoided.

Figure 9: Conditions of catwalk, railings and hatch cover between bays 18 and 21

5. Conclusions

5.1 On 13 January 2023, *the vessel* berthed at the port of Guayaquil, Ecuador for discharging and loading containers.

5.2 At 0755 hours on 14 January 2023, *the vessel* discharged all containers and commenced loading containers including reefer containers. At 2055 hours, eight shore technicians of *the service company* boarded *the vessel* to connect *the vessel*'s power supply to the reefer containers stowed in each of the bays on board.

5.3 At 0335 hours on 15 January 2023, *the D/C* found that stevedores were suddenly rushing to bay 21 when he assisted in a cargo watch on the deck at bay 10. He then followed them and saw *the technician* lying unconsciously on the top of *the container* at row 01 tier 04 stowed under the deck in *the hold*. He reported the accident to *the 2/O* and *the C/O*. Both of them immediately arrived at the scene to check the situation. At 0350 hours, a shore rescue team arrived to examine *the technician* and declared his death at 0355 hours. *The Master* reported the accident to the management company of *the vessel* and the local agent. At 1210 hours, the body of *the technician* was shifted ashore by shore crane.

5.4 The investigation identified that the contributory factors leading to the accident were that -

(a) *the technician*: -

lacked safety awareness of the risk of falling from height while working alone in the vicinity of the opening of *the hatch cover*.

(b) the crew: -

failed to follow the requirements of the shipboard SMS to ensure that *the technician* used appropriate PPE during the cargo operation.

5.5 The investigation also found that the external communication between shore personnel and the crew was ineffective, i.e. no safety meeting before work, no safety instructions of wearing appropriate PPE during work, no risk assessment and no control measures taken

for working aloft, no action taken to close *the hatch cover* as soon as cargo operation stops in accordance with the requirements of *the Code*; and that the internal communication between shore technicians and *the service company* was also ineffective, i.e. no safety instructions and no supervision for the work of the shore technicians on board during the cargo operation.

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) enhance safety awareness of the risk of falling from height while working in the vicinity of the opening of the hatch cover;

(b) strictly follow the requirements of shipboard SMS to ensure that the shore technicians use appropriate PPE during cargo operation including wearing a safety harness with a lifeline or other arresting device when working aloft; and

(c) enhance the communication between shore personnel and the crew on board to:

i) carry out a safety meeting before cargo operation, including providing safety instructions for wearing appropriate PPE, and conducting risk assessment with control measures for working aloft; and

ii) strictly follow the requirements of *the Code* to close hatch cover immediately as soon as cargo operation stops.

6.2 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 Company* and the Master of *the vessel* for comments.

7.2 By the end of consultation, comments from *the Company* were received and the report had been amended as appropriate.