Report of investigation into the fatal accident of an Ordinary Seaman falling into the cargo hold onboard the Hong Kong registered bulk carrier *Tian Bai Feng* at Lanoraie anchorage, Montreal, Canada on 2 July 2014

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

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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 Merchant Shipping (Safety) Ordinance (Cap. 369), 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. On 2 July 2014, the Hong Kong registered bulk carrier *Tian Bai Feng* (*the vessel*) anchored at the Lanoraie anchorage, Montreal, Canada. The crewmembers were assigned to carry out cargo holds cleaning work prior to loading grain. An ordinary seaman (OS) and a fitter were tasked to clean the cargo hold No.6.

1.2. At about 1915 on the same day, the OS came out from the cargo hold No. 6 after having finished work, followed by the fitter. The OS proceeded to check whether anybody was still working inside the cargo hold No.7. He stepped on the hatch covers closing chains to view the interior of the cargo hold. At that time, the chief engineer was operating the hydraulic motor to pull the chains in order to close the hatch covers of the cargo hold No.7. The sagged chains were tightened and swung up and down. As a result, the OS was bounced up, lost his balance and fell into the cargo hold. He was declared dead on board.

1.3. The investigation into the accident revealed the following contributing factors:

a) The safety awareness of the OS was poor, he stepped on the chains while the cargo hold was opened. The OS lost his balance and fell into the cargo hold through the hatchway;

b) The chief engineer who operated the chains driving system for closing the hatch cover, did not ensure that everyone had been cleared from the hatch before closing the hatch covers; and

c) The chief engineer failed to organize the operation according to the company procedure.

2 Description of the vessel

2.1 Particulars of the vessel

Name of the vessel:	*Tian Bai Feng*
Flag :	Hong Kong, China
Port of Registry :	Hong Kong
IMO No. :	9218167
Call Sign :	VRWP5
Ship Type :	Bulk Carrier
Keel Laid :	1999
Gross Tonnage :	39,042
Deadweight :	74,269
Length Overall :	224.89 m
Moulded Breadth :	32.2 m
Main Engine Power:	B & W 7S50MC/8832K
Engine Power:	7943 KW(10800HP)
Classification Society :	Bureau Veritas (BV)
Shipbuilder :	Namura Shipbuilding Japan
Registered Owner :	Cypress Peak Shipping S.A.
Management Company :	China Shipping (Hong Kong) Marine Co., Ltd

Figure 1- *Tian Bai Feng* at berth

2.2 Particulars of the hatch covers

The vessel has seven cargo holds with hatch covers in the type of MacGregor hydraulic to confirm side rolling (Figure 2).

Figure 2- hatch covers type, chains driving system

3 Sources of evidence

3.1 Information from the management company of *Tian Bai Feng*.
3.2 Information from Transportation Safety Board of Canada.

4 Outline of events

All times are local (UTC-4)

4.1 On 24 June 2014, the *vessel* arrived at the port of Montreal, Canada in ballast condition. She anchored at Lanoraie anchorage and waited for the loading of cargo which was scheduled to take place from 5 to 7 July 2014. The voyage order of *the vessel* was to load grain in Montreal for a discharge port in Spain. Cargo hold inspection was completed satisfactorily on 24 and 25 June 2014.

4.2 At around 1430 on 2 July 2014, the *vessel*'s agent informed that the berthing was advanced to take place before 2400 on the same day. As many flying insects had entered the cargo hold area at the time of the cargo hold inspection, the master requested the crewmembers to clean the cargo holds No.5, 6 and 7 before loading.

4.3 At about 1840 on 2 July 2014, the following crewmembers started to clean the respective cargo holds:

Cargo holds	Responsible crewmembers
No.5	3rd engineer, 4th engineer & oiler A
No.6	fitter & the OS
No.7	chief engineer & oiler B

4.4 At about 1910, the chief engineer and oiler B finished their work and came out from the access hatch at starboard forward of the cargo hold No.7. A safety check was then conducted along the hatch coaming by the oiler B and the chief engineer (Figure 3 - each person's route and location in the incident). The oiler B inspected the port side forward, starboard forward and the starboard aft respectively. He found that everything was normal and walked forward and at the time of incident, he was at about the half way of his passage along the No.7 hold at the starboard side.

4.5 At the same time, the chief engineer, after having completed the safety check, proceeded to the control station at port side aft of the hatch coaming in order to operate the hydraulic valves to close the hatch covers of the cargo hold No.7, which were approximately two-third open (Figure 4).

4.6 At that time, the OS and the fitter had also finished their work in the cargo hold No.6 and came out via the access hatch at port side aft of the cargo hold. The OS came out first, followed by the fitter. The OS went to check if anyone was still working in the cargo hold No.7, he stepped on the landing plate (Figure 5) at the forward starboard corner of the hatch No.7. The landing plate was just below the chains used for the hatch cover operating system.

4.7 At approximately 1915, in order to have a better view of the bottom of cargo hold

No.7, the OS stepped on the chains. At the same time, the chains driving system was activated to close the hatch covers. The sagged chains were straightened and caused the OS to spring up. He was pushed over the hatch coaming and fell into the bottom of the cargo hold. At that moment, the fitter was just coming out of the access hatch of the No.6 hold and witnessed the process of OS's feet being above the chains and the OS falling over the hatch coaming into the cargo hold No.7. The fitter shouted to the chief engineer to stop the closing hatch covers operation but it was too late. The OS fell at a height of about 18 meters from the hatch coaming to the bottom of the cargo hold.

4.8 The incident was reported to the master of the *vessel* immediately and the master sought emergency medical assistance from the local port authority.

4.9 At 1937 on 2 July 2014, the local rescue team and the costal guard came onboard. At 2030 on 2 July 2014, the rescue team declared that the OS was dead in situ.

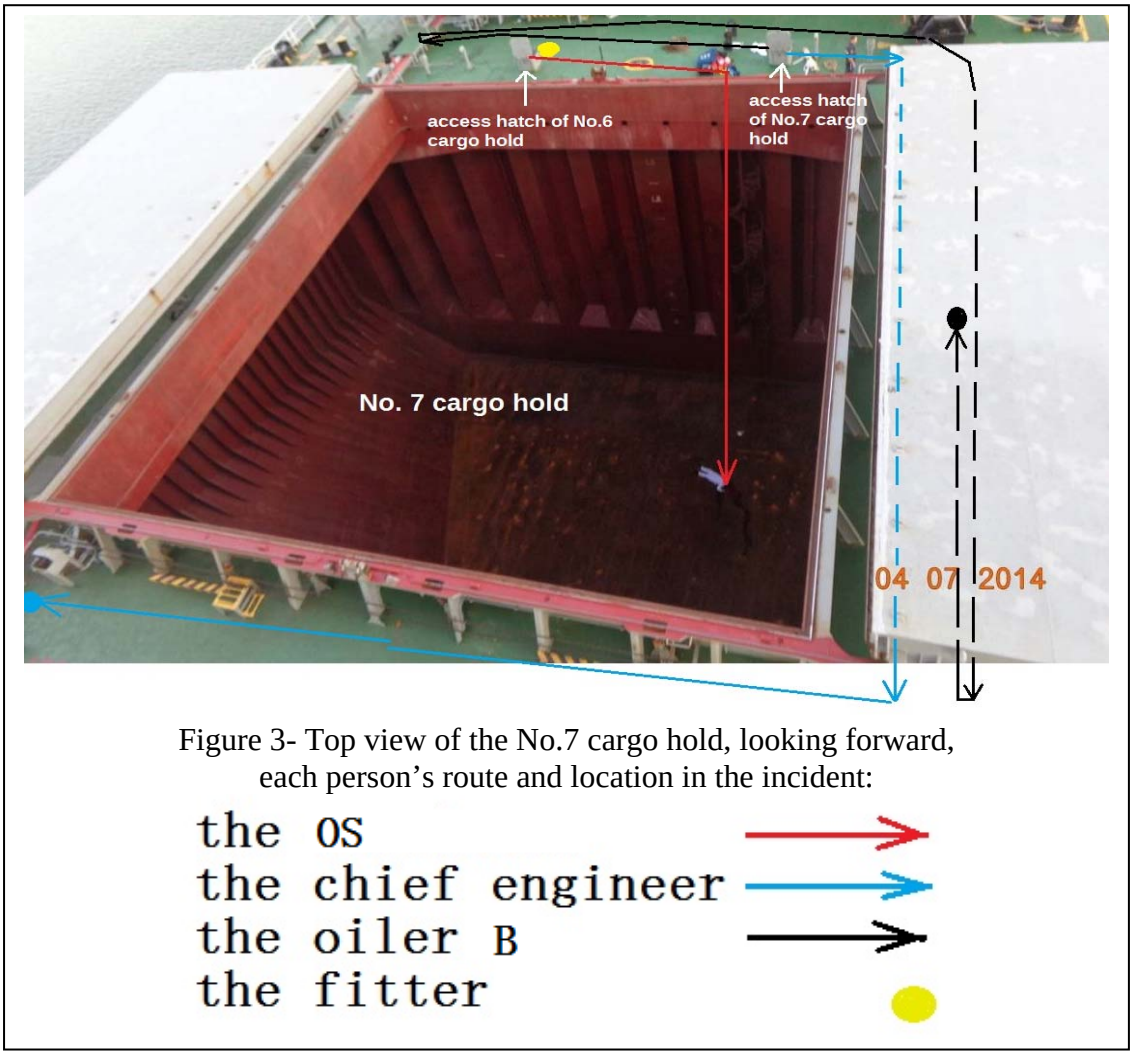

Figure 3- Top view of the No.7 cargo hold, looking forward, each person's route and location in the incident:

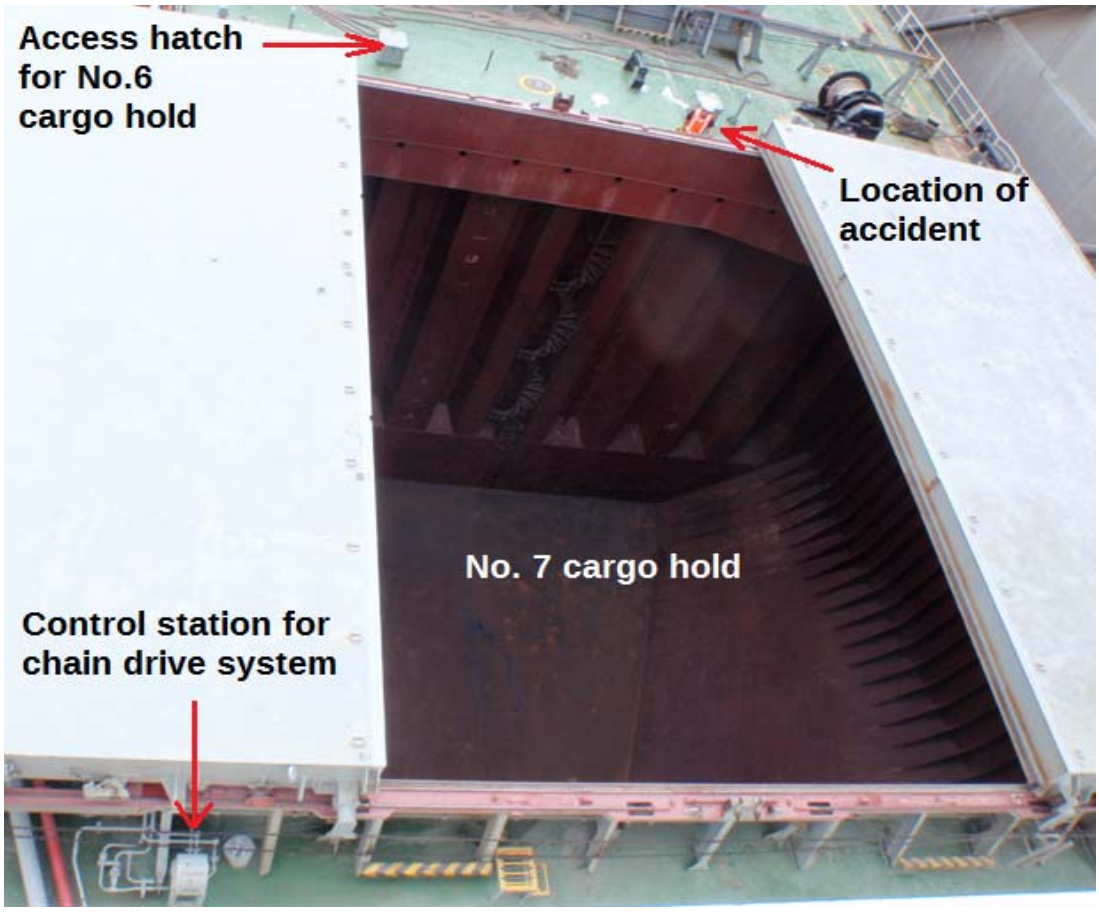

Figure 4- Top view of No.7 cargo hold, looking forward, hatch covers as shown are estimated as being two-thirds open

Figure 5- View from port side looking towards the accident location

5 Analysis

Certification and Experience

5.1 The master of the vessel started his seafarer experience in 1997 and was promoted to the rank of master in 2012. He joined the *vessel* as a master on 10 March 2014. He held a valid Certificate of Competency (COC) as master at time of incident.

5.2 The chief engineer of the *vessel* started his seafarer experience in 2002. He was promoted to the rank of chief engineer when he joined the *vessel* on 10 March 2014. He held a valid COC as chief engineer at the time of the incident.

5.3 The OS started his seafarer experience in 2010. He was also the commissar of the *vessel* and was responsible for assisting the master to handle finances, crew morale and discipline matters. He joined the *vessel* on 10 March 2014. He had completed the required relevant training in accordance with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended (STCW). His working experience was adequate as an OS on board the *vessel*.

The operating procedure of the hatch covers

5.4 The company procedure of the opening and closing operation of hatch covers specified that:

a. The closing and opening operation of the cargo hatch must be carried out under the order of a specified commander who is familiar with the equipment performance and operation procedure, the level of expertise of all persons in the operation, and who possessed the knowledge and ability to handle general equipment malfunctions. The commander should also take care of the safety of all persons in the operation with regards to their working environment.

b. Prior to the operation, it must be ensured that nobody or no other obstruction is on the hatch covers or the location of the hatch covers. It also has to be ensured that all secured hooks have been removed.

c. During the operation, all persons are prohibited from getting on the hatch cover and putting their feet or hands on the hatch covers, or on the pathway of the rollers. All persons must stay away from steel wires, chains and the area that the hatch covers may reach.

The operation of close hatch covers

5.5 After the cleaning work of the cargo hold No.7 had been completed, the chief engineer

and the oiler B went out of the cargo hold and proceeded to do a safety check in preparation to close the hatch covers (Figure 3). They found that everything was normal and the chief engineer proceeded to the control station. His vision being blocked by the hatch cover, the chief engineer was not able to see the OS standing on the chains and he started the operation of closing the hatch covers (Figure 6). At that time, oiler B was situated on the main deck about the half way along the No.7 hold on the starboard side. The chief engineer who was the highest ranked officer in the teams, had failed to take overall control of the operation.

5.6 That the chief engineer did not ensure that everyone had cleared from the hatch covers before closing was considered as one of the contributing factors of this accident.

Dangerous behavior of standing on the chains

5.7 After the OS had come out from the cargo hold No.6, it was not clear why he immediately went to check whether there was anybody still working inside the cargo hold No.7. In order to have a clear view inside the cargo hold No.7, rather than standing on the landing plate, he stepped on the chains which were at a higher position than the landing plate. It was a dangerous act for the OS to stand on the chains as he may lose his balance and resulting in falling into the cargo hold through the hatchway.

5.8 At the time of the accident, the chief engineer was just operating the hydraulic motor to pull the chains for closing of the hatch covers of the cargo hold No.7. The sagged chains were tightened and sprung. As a result, the OS was bounced up, lost his balance and fell into the cargo hold.

The chains driving system and the operating station

5.9 A banging sound could be heard on the deck when the hydraulic system and the hydraulic motors were running. There was no visual or audible warning signal to indicate that the chains driving system was operating.

5.10 The control console for opening and closing of the hatch covers for each the cargo hold was installed at deck level. As the height of the hatch covers was about 3 metres, the view of the operator would be obstructed and rendered him not able to see the opposite side of the cargo hold (Figure 6).

5.11 The two chains for the chains driving system located above the landing plates on the forward hatch coaming (Figure 5) and no protect guard or other safety device was fitted to protect personnel standing on the landing plates from being hurt by the running chains during the hatch cover operation.

Weather and environment conditions

5.12 At the time of the accident, the weather was fine and the sea was calm with southwesterly wind at force 3 to 4 at Beaufort scale. The illumination was adequate with good daylight. Both the weather and environment conditions did not attribute any adverse effect to the incident.

Figure 6- Simulation of the accident:
View of operator was obstructed

6 Conclusions

6.1 On 2 July 2014, the Hong Kong registered bulk carrier *Tian Bai Feng* (*the vessel*) anchored at Lanoraie anchorage, Montreal, Canada. The crewmembers were assigned to carry out cargo holds cleaning work prior to loading grain. An ordinary seaman (OS) and a fitter were tasked to clean the cargo hold No.6.

6.2 At about 1915 on the same day, the OS came out from the cargo hold No. 6 after having finished work, followed by the fitter. The OS proceeded to check whether anybody was still working inside the cargo hold No.7. He stepped on the hatch covers closing chains to view the interior of the cargo hold. At that time, the chief engineer was operating the hydraulic motor to pull the chains in order to close the hatch covers of the cargo hold No.7. The sagged chains were tightened and swung up and down. As a result, the OS was bounced up, lost his balance and fell into the cargo hold. He was declared dead on board.

6.3 Investigation into the accident revealed the following contributing factors:

a) The safety awareness of the OS was poor; he stepped on the chains while the cargo hold was opened. It was a dangerous act and the OS lost his balance and fell into the cargo hold through the hatchway.
b) The chief engineer who operated the chains driving system for closing the hatch cover did not ensure that everyone had been cleared from the hatch before closing the hatch covers; and
c) The chief engineer failed to organize the operation according to the company procedure.

6.4 Investigation also revealed the following safety issues:

a) There was no visual or audible warning signal to indicate that the chains driving system was operating; and
b) The chains for the chains driving system located above the landing plate and no protect guard or other safety device was fitted to protect personnel being hurt by running chains during the hatch cover operation.

7. Recommendations

7.1 A copy of the report should be sent to the master and the management company of the vessel drawing their attention of the findings of this incident and the lessons learnt. The management company of the vessel should ensure that:

a) The company procedure, "the instruction for opening & closing operation of hatches", is effectively implemented and crewmembers should be well trained under the procedure;

b) Visual and audible warning signals to alert personnel aware of the pending operation of hatch should be fitted; and

c) Protective guards should be fitted or other arrangement should be made to prevent crew from being hurt by the running chains.

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

8. Submission

8.1 In the event that the conduct of any person or organization is commented in an accident investigation report, it is the policy of the Marine Department to send a copy of the draft report in part or in entirety to that person or organization for their comments.

8.2 The draft report has been sent to the following parties for comment:

a) The owner/management company, the master of *Tian Bai Feng*

b) Transportation Safety Board of Canada

8.3 No submission was received from the above parties.