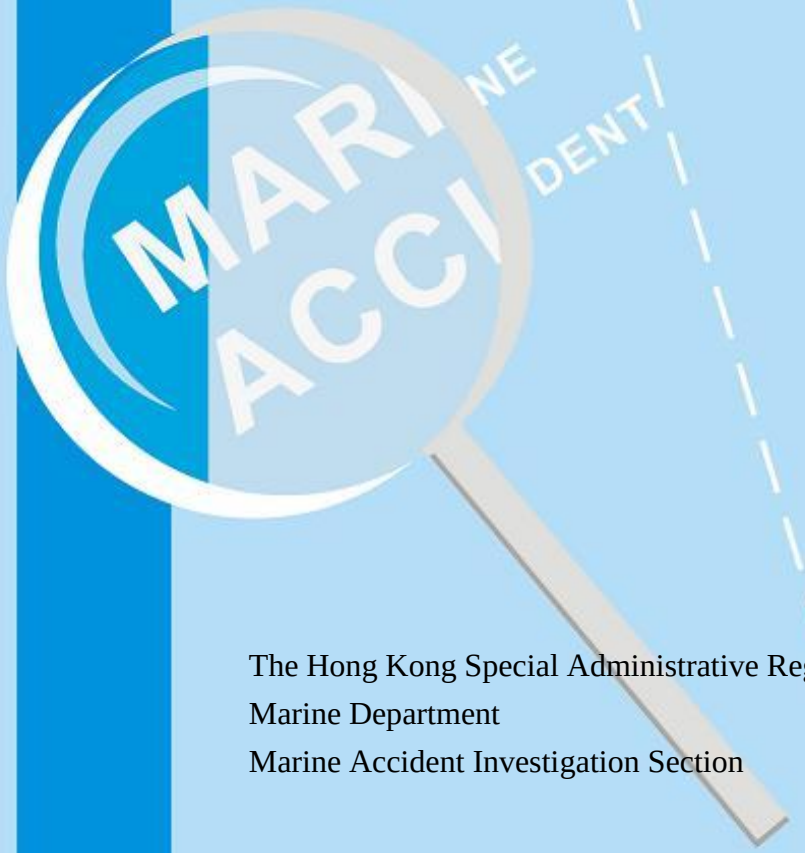
Report of investigation into the fatal accident of Hong Kong registered cargo ship *"Great Immensity"* in Kohsichang anchorage, Thailand on 26 April 2014



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

6 May 2015

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 25 April 2014, the Hong Kong registered cargo ship "Great Immensity" was anchored in the anchorage at 13°07'N, 100°46'E, in Kohsichang, Thailand after having finished discharging steel products cargo at berth.

1.2 On 26 April 2014, prior to carrying out the cleansing of the cargo holds and main deck by crew, risk assessment was conducted and permit-to-work aloft was issued. The work started in the morning and was suspended for lunch.

1.3 Before resuming the work, a safety briefing was held by the bosun and attended by 3 ABs (Able Bodied Seaman) and a cadet, without the attendance of any senior officer. 2 ABs (AB1 and AB2) were assigned in one team to cleanse the No.4 cargo hold, the coaming gutter way and hatch covers.

1.4 At about 1540 on 26 April 2014, while AB1 was cleansing the gutter way at the port side of No.4 cargo hold, his safety harness was tangled with the flattened water hose. He unhooked his safety harness from the guard rope and tried to free it from the water hose. AB2 assisted him to straighten the bend on the hose. Suddenly, the flattened water hose under the foot of AB1 was inflated and stretched or jerked. He lost his balance and fell from a height of about 16 m to the bottom of No.4 cargo hold, sustaining serious injuries and went unconscious. He was sent ashore and was declared dead at the hospital.

1.5 At the time of the accident, the weather was fine, with southeasterly wind of about force 3 on the Beaufort scale. The sea condition was calm.

1.6 The investigation into the accident revealed that the most probable contributory factors to the accident were as follows:

- The deceased AB1 unhooked his safety harness from the guard rope in the course of work without paying attention to the risk of falling at height from the gutter way;
- A part of pressurized water hose, which had become flat due to bending of the hose, was inflated, stretched or jerked suddenly and hit the crew when the bend on the water hose was straightened.

2. Description of the Vessel

2.1 Particulars of the Vessel "Great Immensity"

Flag	:	Hong Kong, China
Port of Registry	:	Hong Kong
IMO No.	:	9188025
Call Sign	:	VRVX8
Ship Type	:	Other Cargo Ship
Year of Built (Delivery)	:	21 January 1999
Gross Tonnage	:	23,259
Net Tonnage	:	11,914
Deadweight	:	32,431 mt
Length (Overall & LPP)	:	LOA: 173.60 m / LPP: 163.60 m
Breadth (moulded)	:	27.70 m
Depth (moulded)	:	15.50 m
Summer Draft	:	11.63 m
Main Engine & Power	:	Diesel Engine, Sulzer NSD 6RTA52, 7150kW
Classification Society	:	Bureau Veritas
Management Company	:	Sinotrans Ship Management Limited
Minimum safe manning	:	14
Persons on board	:	24

Fig.1 – the Hong Kong registered cargo ship *"Great Immensity"*

3. Sources of Evidence

3.1 The statements provided by the master and crew of *"Great Immensity"*

3.2 The information provided by the operation company

4. Outline of Events

All the times are local (UTC+8) if not specified otherwise.

4.1 At late night of 25 April 2014, the discharge of steel product cargo was completed. The Hong Kong registered cargo ship "Great Immensity" (*the vessel*) then proceeded and anchored in the anchorage at position 13°07'N, 100°46'E in Kohsichang, Thailand. Cargo hold cleansing by the crew was planned to be carried out next day.

4.2 At about 0800 on 26 April 2014, a risk assessment for cleansing cargo holds and main deck was completed by the chief officer. The result of the assessment and the control measures were reviewed and approved by the master. The work aloft/overside checklist was completed and a permit-to-work aloft was issued by the master. The cleansing work commenced afterwards and was suspended later for lunch.

4.3 Before resuming the work, a safety briefing was conducted by the bosun attending by 3 ABs and a cadet. 2 ABs (AB1 and AB2) were assigned in one team to cleanse the coaming gutter way and hatch covers of the No.4 cargo hold (Figure.2).

4.4 The safety measures for the work were applied extensively by having a guard rope fastened to the ends of the coaming; and attaching the crew's safety harnesses to the guard rope while working on the gutter way.

4.5 At about 1540 on 26 April 2014, AB1 was standing at the middle of the gutter way in way of No.4 hatch port side coaming. The hose was flattened as the hose was bent and hence blocked the water flow. AB1's safety harness was tangled with the flattened water hose. He unhooked his safety harness from the guard rope and tried to free it from the water hose. AB2 assisted to release the bends on the hose. Suddenly, the flattened water hose under the foot of AB1 was inflated and stretched or jerked when water pressure built up inside the flattened hose after the bends had been unfolded. AB1 lost his balance and fell down to the bottom of the No.4 cargo hold from a height of about 16 m. He was seriously injured and unconscious.

4.6 Resuscitation was administered to AB1 immediately. He was removed from the cargo hold and sent to hospital at shore for medical treatment. At about 1735 on the same day, AB1 was declared dead upon arrival in the hospital.

4.7 At the time of the accident, the weather was fine, with southeasterly wind of

about force 3 on Beaufort scale. The sea condition was calm.

Fig.2 – Arrangement for working on the gutter way of coaming.

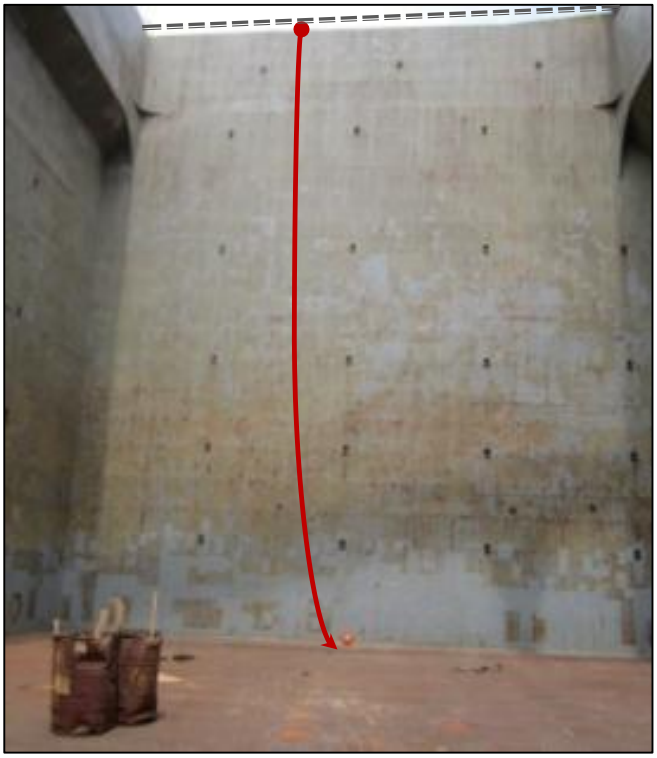

Fig.3 – Cargo hold No.4, the red arrow indicating the fall of AB1.

5. Analysis

The Vessel and her crew

5.1 *The Vessel* was delivered in December 1999. At the time of the accident, all statutory certificates of *the Vessel* were valid.

5.2 According to Minimum Safe Manning Certificate, *the Vessel* should be manned by at least 14 crew including the master. There were a total of 24 Mainland Chinese crew including the master on board *the Vessel*. All of them held valid Certificates of Competency respectively to their posts on board. AB1 had served as an Able Bodied Seaman (AB) for more than four years with good records. He joined *the vessel* on 13 July 2013.

Risk assessment and working permit

5.3 The cargo hold cleansing operation was categorized as "very high risk" ranking in the risk assessment due to possible fall at height. The risk was downgraded to "very low" by adopting control measures described as "using of guard lines, and the crew must wear safety helmets, safety harnesses". No environment condition such as high temperature / humidity and sea condition was considered in the risk assessment.

5.4 In the permit-to-work aloft/overside issued by the master, it was mentioned that safety harnesses and lines should be attached to a strong point, and an on-deck supervisor should be identified to supervise the operation. Nevertheless during the operation, no on-deck supervisor attended the scene to supervise the operation in accordance with the requirements of the ship's safety management system (SMS).

5.5 Before the cleansing operation resumed in the afternoon on 26 April 2014, the bosun had conducted a safety briefing to the team members. There was no senior officer involved in the briefing to team members on critical measures to be observed during the cleansing operation on top of the gutter way of cargo hold coaming. It was against the requirements of SMS.

5.6 As a general practice on board the vessel, a guard rope was secured on the coaming for such operation. The gutter way of the coaming was about 40 cm in width. The hatch cover was half-opened for the convenience of cleansing. The crew wore safety harness with a safety lanyard attaching to the guard rope while working on the gutter way.

Fig. 4 – One crew was cleansing the hatch coaming on the gutter way.

5.7 Normally, the gutter way would become wet and slippery during cleansing. The guard rope should not be regarded as a guard rail. The gap between the rope and the hatch coaming was about 1 metre at the midway. It was more than 1 metre in other areas. The guard rope connecting to the safety harness must be maintained by the crew at all times to prevent falling at height.

5.8 At the time of the accident, AB1 was standing in the middle of the hatch coaming. He disconnected the connecting lanyard of his safety harness from the guard rope in order to release his safety harness from tangling with the flattened water hose. After the bends of the water hose had been unfolded by AB2, the flattened water hose under the foot of AB1 inflated suddenly when pressure built up inside the hose. Under the circumstance, the hose which was under the foot of AB1 stretched or jerked. It was probable that it caused AB1 to lose his balance. As his safety harness was not attached to any strong point and both of his hands were occupied (one hand holding the lanyard of his safety harness and the other hand holding the nozzle), he was unable to grab the guard rope in time and consequently fell down to the bottom of the No.4 cargo hold about 16 m below the coaming

gutter way.

Fig.5 – view from forward, a guard rope was secured along the coaming.

Healthy, Alcohol, drugs and fatigue effects

5.9 According to his medical certificate, AB1 was medically fit to work on board ship. No evidence indicated that he was affected by alcohol and/or drugs before the accident. On 26 April 2014, the work-rest record showed that he had worked for about 6.6 hours starting from 0800 until the time of the accident and he got 1 hour of lunch break in this period of time. On 25 April 2014, he worked for about 7.5 hours with a total of 16.5 hours of rest for the whole day. Fatigue at work of AB1 was not considered as a factor leading to the accident.

5.10 The sky was cloudy, the air temperature was 31°C. There was no complaint on the adverse effect of hot weather. Heat exhaustion was not considered as a contributory factor to the accident. However, the risk on high temperature/ humidity was not assessed in the risk assessment before the outdoor operation under hot weather.

Follow up action conducted by the company after the accident

5.11 The master of *the Vessel* conducted a safety meeting after the accident. He

highlighted to the crew the importance of proper setting up of the guard rope and use of safety harness with lifeline to ensure a safe working environment during the operation. He also highlighted that senior officers should attend the safety briefing meeting and supervise on scene of any critical operation in order to ensure the crew's safety at work. A non-conformance and correction action report was sent to the company.

5.12 The company conducted an investigation into the accident and issued a circular to their fleet on 29 April 2014 to promulgate the lessons learnt. The attention of crew was drawn as follows:

1. Risk assessment should be carried out on all high risk work and activities to ensure that all hazards are identified and the necessary controls in place are implemented to reduce risks to an acceptable level;

2. Safety harness should always be worn when working aloft;

3. The master or senior officers shall organize and chair a safety meeting prior to the work / activities commenced; and

4. Responsible officers should supervise closely the work process to ensure that the necessary measures / equipment remain in place until the works have been safely completed.

5.13 The above actions taken by the company fleet served as a general notice. Besides, particular risk aspects of high temperature, control measures on the usage of safety harness linkage and setting up of guard rope should also be considered**.**

6. Conclusion

6.1 On 25 April 2014, the Hong Kong registered cargo ship "Great Immensity" was anchored in the anchorage at 13°07'N, 100°46'E, in Kohsichang, Thailand after having finished discharging steel products cargo at berth.

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6.7 The following safety factors were also found in the investigation:

- No officer was on deck to supervisor the operation;
- Senior officers did not brief the crew on the critical safety measures in the operation.

7. Recommendations

7.1 The management company should issue safety circular to the managed fleet to inform all masters, officers and crew of the findings of the accident investigation.

7.2 The management company should review the safety procedures for cargo hold cleansing, or other similar operations on board involving working aloft/overside, taking into consideration of the following:

a) The crew should always keep the lanyard of safety harness attaching to a strong point while working aloft/overside;

b) Senior officers on board should initiate safety briefing to crew before commencement of the work and be on scene to supervise the safety of crew at work.

7.3 A Hong Kong Merchant Shipping Information Note (MSIN) should be issued to promulgate the lessons learnt from this fatal accident.

8. Submissions

8.1 In the event that the conduct of any person or organization is criticized in an accident investigation report, it is the policy of the Marine Department that a copy of the draft report should be given to that person or organization so that they can have an opportunity to express their comments on the report or offer evidence not previously available to the investigating officer.

8.2 Copy of the draft report has been sent to the following parties for comments:

a. the operation company;

b. the master and the chief officer of *"Great Immensity"*.

8.3 No submission was received from above parties.