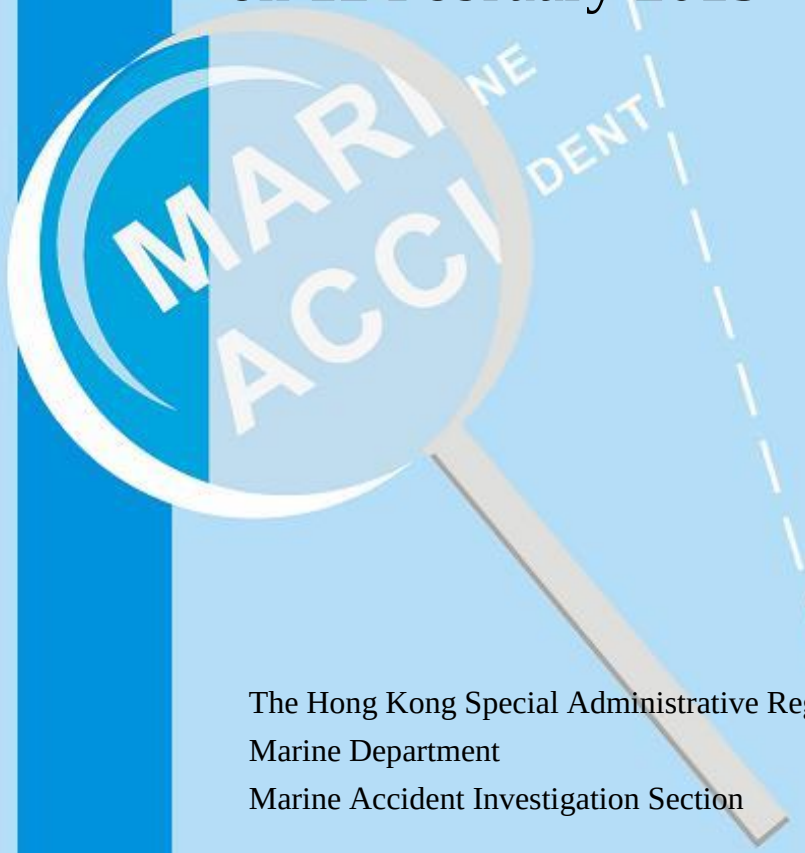
Report of investigation into the fatal accident of a deck cadet on board the Hong Kong registered container vessel "OOCL Europe" at Dammam, Saudi, Arabia on 12 February 2015



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

1 February 2016

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 to wards 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 At 0400 on 12 February 2015, the Hong Kong registered container vessel "OOCL Europe" (the *vessel*) was preparing for departure from a berth in the port of Dammam, Saudi Arabia. The second officer (2/O) was the person in-charge of the aft mooring station, and was assisted by a senior quarter-master (QM), an ordinary seaman (OS) and a deck cadet (DC).

1.2 The pilot came on board at 0410. Two stern ropes were let go from the berth and retrieved to ship by a mooring winch. It was a requirement of the port authority that ship's rope should be used as a towline during unmooring operation. One of the stern ropes retrieved was unreeled partly and laid on the deck. The eye splice of the towline was led down over the ship side after passing a bollard and a universal fairlead.

1.3 At 0417, after the towline picked up by the tug boat, she slowly moved away from the *vessel*. At about 0419, the OS and the DC, who were standing close to the towline, continued monitoring the pay out of the towline. The QM was on stand-by at the port side mooring winches remote control station. The 2/O was at a short distance forward to communicate with the tug boat operator by hand signals.

1.4 When the towline lying on deck had almost slipped overboard, the 2/O ordered the QM to operate the mooring winch to unreel extra length of the rope. At 0420, the tug boat moved quickly away from the *vessel* rendered the towline subjected to a sudden tension. The towline slipped out of the bollard, stretched and straightened and snapped forward. As a result, the towline hit the chest of the DC.

1.5 The 2/O requested the tug boat to stop pulling the towline and afterwards he found the DC was injured with blood coming out from his nose and was in unconscious condition. Later on, medical officers from shore attended on board and confirmed that the DC had died.

1.6 At the time of accident, it was cloudy. The wind was blowing from the southeast and of force 4 on the Beaufort scale. The sea condition was slight and the visibility was about 10 nautical miles.

1.7 The investigation into the accident revealed the main contributory factors as follows :

(a) the officer in charge of the unmooring operation at aft station was not familiar with the operation using ship's rope as towline, however, risk assessment was not carried out to determine the risk and the necessary planning and safety precautionary measures;

(b) the junior officer (the DC) was not closely supervised and monitored while he was engaging in critical shipboard operations on board as he was not warned to stay clear of snap-back zone and the towline during operation, particularly after the tug boat had picked up the towline; and

(c) ineffective communication between the *vessel* and the tug boat, and the tug boat operator without aware of the actual mooring arrangement, quickly hauled the towline thus rendered it slipping out of the bollard.

2. Description of the Vessel

2.1 Particulars of the vessel

Name of the vessel	:	OOCL Europe
Flag	:	Hong Kong, China
Port of Registry	:	Hong Kong
IMO No.	:	9300805
Call Sign	:	VRBX7
Ship Type	:	Container Ship
Year of Built (Delivery)	:	2006
Gross Tonnage	:	89097
Net Tonnage	:	55204
Deadweight	:	99617 mt
Summer Draft	:	14.528 M
Length (Overall)	:	LOA: 322.971 m
Breadth (moulded)	:	42.80 m
Main Engine & Power	:	MAN-B&W 1 x 12K98MC-C, 69 468 kW
Classification Society	:	American Bureau of Shipping (ABS)
Management Company	:	Orient Overseas Container Line Ltd. (OOCL)
Persons onboard	:	27

Fig.1- *OOCL Europe*

3. Sources of Evidence

3.1 The Master and crew of *OOCL Europe*;

3.2 The information provided by the management company of *OOCL Europe*.

4. Outline of Events

All the times are local (UTC + 3).

4.1 At 1042 on 10 February 2015, the Hong Kong registered container vessel "OOCL Europe" (the *vessel*) was berthed with starboard side alongside a berth in the port of Dammam, Saudi Arabia.

4.2 After cargo work had been completed, the *vessel* was prepared for departure at about 0400 on 12 February 2015. The second officer (2/O), the senior quarter-master (QM), the ordinary seaman (OS) and the deck cadet (DC), wearing personal protective equipment, proceeded to the aft mooring station.

4.3 At 0410, the pilot was on board. It was required by the port authority that during unmooring operation, ship's mooring rope should be used as towline. As per pilot's instruction, two mooring ropes at the stern of the *vessel* were let go from berth. Under the 2/O's order, the QM operated the No.6 mooring winch at the starboard side mooring winches remote control station to retrieve the two stern ropes.

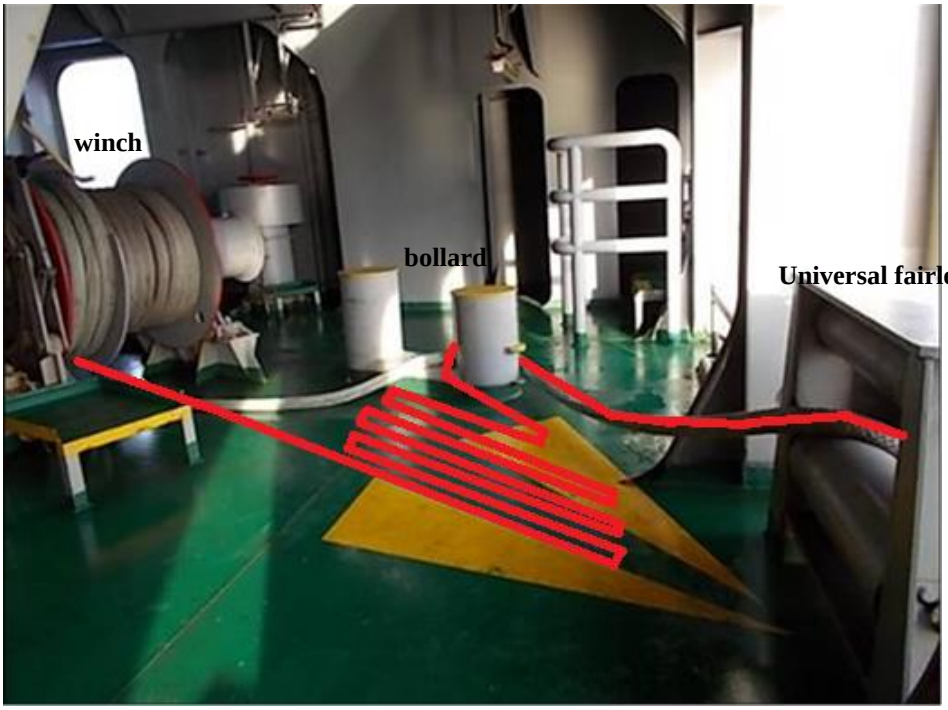

Fig.2 – mooring rope lying on deck before the accident

4.4 At 0415, the two stern ropes had already been stowed in the drum of the winch. As one mooring rope on the No.6 mooring winch would be used as towline at aft of *the vessel*, the QM went to the port side mooring winches remote control station to operate the No.6 mooring winch to unreel the rope partly from the drum. The 2/O, the OS and the DC helped to lay the rope on deck in front of the No.6 mooring winch. The eye splice of the towline was led down over the ship side after passing a bollard and a universal fairlead (see Fig.2).

4.5 At 0417, the 2/O sent the messenger rope down to the tug boat when she came alongside the *vessel's* port side. After that, the 2/O, the OS and the DC slowly passed the towline downward until it was made fast to a bollard on the tug boat.

4.6 At 0419, while the OS and the DC continued paying out the towline, the tug boat began to move away from the *vessel*. At that moment, the towline was still slack. The 2/O went a short distance forward where he could communicate easily with the tug boat operator by hand signals.

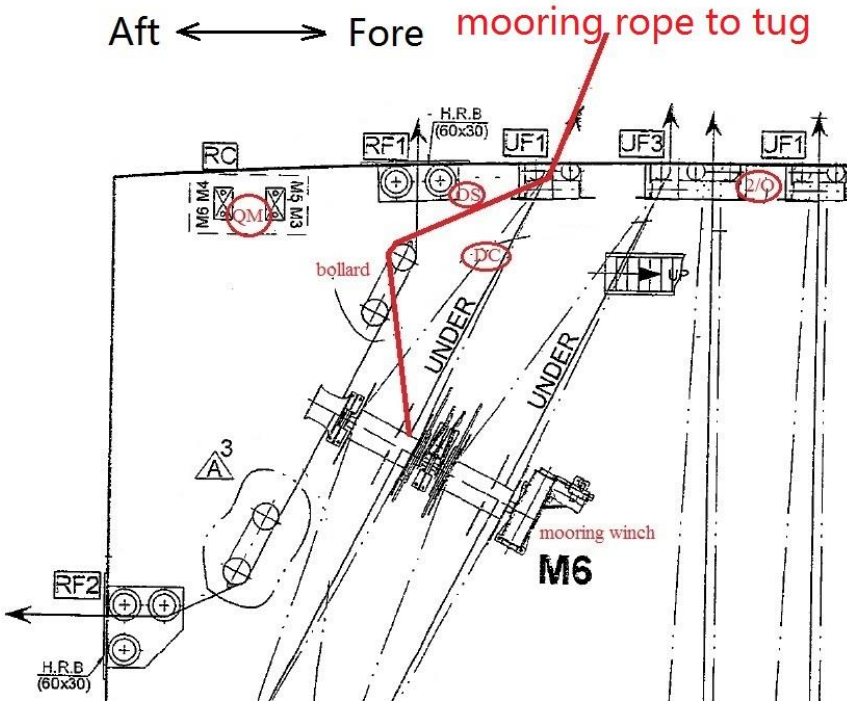

Fig.3 - Location of each person at time of accident.

4.7 The QM was on stand-by at the port side mooring winches remote control station. When the towline lying on deck had almost slipped overboard, the 2/O ordered the QM to operate the No.6 mooring winch to unreel extra length of the rope. At this

moment, the OS was standing beside the towline on the aft side while the DC was standing opposite to him (Fig.3), monitoring the slipping out of the rope.

4.8 At 0420, the tug boat moved quickly away from the *vessel* rendered the towline subjected to a sudden tension. The 2/O immediately gave hand signal to the tug boat operator requiring him to stop hauling the towline. The OS immediately ran away from the towline. He shouted "STOP" and gave hand signal to the tug boat operator.

4.9 Unfortunately, the towline slipped out of the bollard, stretched and straightened under by the pulling force of the tug boat and snapped forward. The DC, who was standing inside the snapping area, was hit by the towline against his chest.

4.10 When the 2/O saw the DC lied down on deck, he shouted "deck cadet is injury". The QM immediately stopped unreeling the towline from the winch. The 2/O checked the condition of the DC and found blood coming out from his nose. The DC was unconscious and had no any movements of the chest and abdomen.

4.11 At 0421, the master on the bridge was informed of the accident by the 2/O through walkie-talkie. The master immediately requested the pilot to call the harbor master, port control, agent and ambulance to come and send the DC to hospital for treatment.

4.12 At 0425, the master arrived at the aft mooring station and found the DC still in unconscious condition. Ship's crew applied Cardiopulmonary Resuscitation and first aid to him. At 0434, medical officers arrived at the scene and confirmed that he had died on board.

4.13 At the time of accident, it was cloudy, wind was southeasterly of force 4 on the Beaufort scale. The sea condition was slight and the visibility was about 10 nautical miles.

5. Analysis

Vessel and crew's certificate

5.1 The *vessel* was built in 2006 and delivered on 26 July 2006. At the time of accident, all statutory certificates of the vessel were valid.

5.2 According to Minimum Safe Manning Certificate, "OOCL Europe" should be manned by at least 15 crew members including the master. There were total 27 crew members including the master on board the vessel. All of them held valid certificates respective to their post on board the vessel.

5.3 The 2/O had worked in the same rank for about 4 years. He joined this vessel on 2 August 2014.

5.4 The DC had served as a deck cadet for about 13 months including this vessel which he joined on 9 January 2015. The DC was considered as a junior officer under training on board the vessel and required close supervision.

Mooring winch and rope

5.5 The No.6 mooring winch was working properly at the time of the accident.

5.6 The mooring rope was a double braided synthetic fiber rope in nominal diameter 75 mm, length 207 m. The certificate of the mill test of the rope indicated the breaking test load of the rope was 1100 KN. The rope was received on board the vessel for service on 26 April 2013. The rope was in good condition and no apparent damage was found.

Snapping of the towline

5.7 At the aft mooring station, after the two ship's mooring ropes at stern were retrieved and stowed on the drum of No.6 mooring winch, a sufficient length of one of these ropes was unreeled and being laid on deck ready for use as a towline by a tug boat in the unmooring operation.

5.8 The eye splice of the towline was hung down over the ship side after passing a bollard and a universal fairlead. As such, the mooring winch which held the towline, the bollard and the universal fairlead formed a triangle (Fig. 4). The towline was unreeled from the lower end of the drum which was about 0.7 to 0.8 meter above the deck. The height of the bollard from deck was about 0.8 meter. The towline passed the bollard without making any turn on the bollard. Under such arrangement, it existed the risk of the rope slipping out of the bollard when the tug boat was pulling the towline.

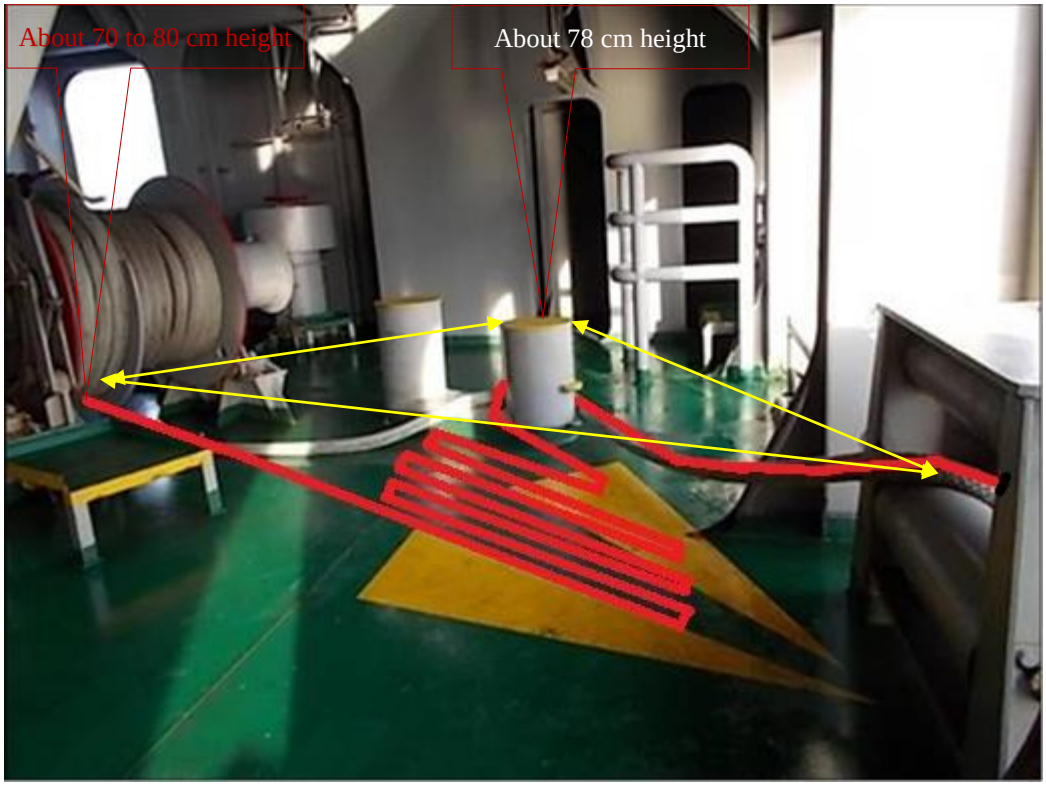

Fig.4 - simulated rope arrangement on deck

5.9 The main deck of the *vessel* was about 8 metres from sea level. After the towline was secured to the bollard on the tug boat, the tug boat moved away from the vessel slowly. Since the crew did not use turns of the towline around the bollard to control the speed at which the towline goes out (refer to the code of safe working practice for merchant seaman), due to its own weight, the towline dropped outboard quickly and the rope lying on deck would swing abnormally without control.

5.10 To prevent the towline slipping out from the bollard, it should be rigged for at least one turn on the bollard. Also, turns of rope fasting to the bollard should be made for controlling the slipping speed of the towline (Code of Safe Working Practice for Merchant Seaman refers).

5.11 In the incident, the towline under tension slipped out of the bollard. Under a pulling force excited by the tug boat, the towline was stretched and straightened and eventually hit and killed the DC, who was staying inside the snapping area.

Communication between the vessel and the tug boat

5.12 Prior to the accident, the 2/O ordered the QM to operate the winch to unreel more length of towline after the section of towline laid on deck was almost out so that it could be fastened on the bollard in the figure of 8 before towing. However, due to

ineffective communication between the vessel and the tug boat, the tug boat operator was not aware of the actual arrangement of the towline on board the *vessel*. The tug boat increased speed and moved away from the *vessel* rendering the towline suddenly under high tension.

5.13 If the tug boat operator and the 2/O had agreed beforehand the length of the towline, it could be laid on deck with the inboard end fastened to the bollard.

Risk assessment

5.14 It was required in the port of Dammam, Saudi Arabia that during unmooring operation, ship's mooring rope should be used as towline. The 2/O, who was the person in charge of the unmooring operation at the aft station, was not familiar with the operation using ship's mooring rope as towline. However, before commencement of the operation, there was no risk assessment carried out. As such the unmooring operation was not well planned and with the necessary precautionary measures established for safe operation.

In this incident, the crew paid out the towline on the drum of the mooring winch and laid it on deck instead of using a spare mooring rope provided on board as towline. Besides, they did not ensure sufficient length of the towline. Otherwise, the crew could have secured the inboard end of the towline to the bollard instead of holding it by the mooring winch. Moreover, turns of towline could have been used around the bollard to control the speed at which the towline goes out. Furthermore, all crew members at the aft station could be alerted to stay away from snap-back zone and the towline as far as practicable during operation.

Supervision

5.15 Mooring and unmooring operations provide the circumstances for potentially serious accidents. Personnel should never stand in the bight of a rope or near a rope under tension, and should treat ropes on drums and bollards with the utmost care (the Code of Safe Working Practice for Merchant Seaman refers).

5.16 While the towline was sending out to the tug boat, it was dangerous for the OS and the DC staying beside the towline. The 2/O and the QM, while concentrating on their duties, did not remind and warn the OS and the DC to stay clear of the towline after it was connected to the tug boat.

5.17 As a junior officer, the DC should be closely supervised and monitored while he was participating in critical operations on board ship such as the unmooring operations in this incident.

6. Conclusion

6.1 At 0400 on 12 February 2015, the Hong Kong registered container vessel "OOCL Europe" (the *vessel*) was preparing for departure from a berth in the port of Dammam, Saudi Arabia. The second officer (2/O) was the person in-charge of the aft mooring station, and was assisted by a senior quarter-master (QM), an ordinary seaman (OS) and a deck cadet (DC).

6.2 The pilot came on board at 0410. Two stern ropes were let go from the berth and retrieved to ship by a mooring winch. It was a requirement of the port authority that ship's ropes should be used as a towline during unmooring operation. One of the stern ropes retrieved was unreeled partly and laid on the deck. The eye splice of the towline was led down over the ship side after passing a bollard and a universal fairlead.

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(c) ineffective communication between the *vessel* and the tug boat, and the tug boat operator without aware of the actual mooring arrangement, quickly hauled the towline thus rendered it slipping out of the bollard.

7. Recommendations

7.1 A copy of the report of investigation should be provided to the management company and the master of the vessel informing them of the findings of the investigation.

7.2 The company should issue instructions instructing the masters and officers of the vessel to strictly follow the mooring operation procedure, in particular the following measures before mooring operation:

(a) carry out risk assessment to determine the precautionary measures, in particular under peculiar situations in which the officer and crew may not be familiar with;

(b) establish comprehensive action plans and ensure effective communication among all parties involved in the operation; and

(c) brief all members of the team about the potential snap-back zone in the mooring stations and closely monitor any junior seafarers such as ordinary seamen and cadets.

7.3 A Hong Kong Merchant Shipping Information Note should be issued to promulgate lessons learnt from this 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, in its entirety or partly, 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 management company, the master, the second officer of the vessel; and

(b) the Shipping Division of the Marine Department.

8.3 No submission was received from the parties in 8.2.