Report of investigation into the fatal accident on board Hong Kong registered container ship "*MCC Chittagong*" at the south of Chittagong port, Bangladesh on 16 December 2016

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

24 October 2019

Purpose of Investigation

The purpose of this investigation conducted by the Marine Accident Investigation and Shipping Security Policy Branch (MAISSPB) 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 MAISSPB has no involvement in any prosecution or disciplinary action that may be taken by the Marine Department resulting from this incident.

Table of Contents **Page**

Summary

On 16 December 2016 at about 1315 hours local time, a fatal accident happened on board the Hong Kong registered container ship *MCC Chittagong* (*the vessel*) at sea after her departure from the port of Chittagong, Bangladesh.

Engine room crew carried out cleaning of a high sea chest strainer after *the vessel* departed the port of Chittagong in the morning on 16 December 2016. At about 1307 hours, the strainer cover was lifted by a chain block with a sling and then shifted aside by a second chain block. While dangled loosely from the second chain block, the cover was rested on the engine room lower deck platform at a distance of about 2 meters away from the strainer.

At about 1315 hours when a fitter was trying to loosen the filter in the strainer with a crow bar, the wire forming an "eye" at one end of the sling slid out of the bulldog grip causing the cover toppled over and fell towards the strainer. The cover hit the fitter and crushed his head onto the strainer. After the accident, *the vessel* returned to Chittagong port and the fitter was sent to a local hospital. He was declared dead on arrival.

The investigation reveals the following contributory factors leading to the accident:

a) The engine room crew failed to carry out full assessment of the risks involved and the control measures required to lift a weighty strainer cover by making reference to the "Code of Safe Working Practices for Merchant Seafarers 2015" (*the Code*); and

b) the sling assembly including the fitted bulldog grips did not conform to the recommendations detailed in *the Code*, as follows:

   (i) the sling assembly used only one bulldog grip at "eye" end instead of a minimum of three;

   (ii) the bulldog grip was tied in a wrong direction; and

   (iii) the wire used for forming the sling was plastic coated and was not suitable for lifting operation.

1. Description of the vessel

Ship name	:	*MCC Chittagong*
Flag	:	Hong Kong, China
Port of registry	:	Hong Kong
IMO number	:	9761023
Type	:	Container Ship
Year built, shipyard	:	2015, Zhejiang Ouhua Shipbuilding Co., Ltd.
Gross tonnage	:	31,649
Net tonnage	:	10,767
Summer deadweight	:	37,158 tonnes
Length overall	:	179.24 metres
Breadth	:	35.20 metres
Engine power, type	:	12,200 kW, MAN 6G60ME-C9.2-18
Classification society	:	DNV GL
Registered owner	:	Tribini Tai Hang Shipowners Limited
Management company	:	Bernhard Schulte Shipmanagement (Singapore) Pte. Ltd.

Figure 1 *The vessel*

2. Sources of evidence

2.1 The master’s report of the accident and the statement of events.

2.2 The statements of the second engineer, third officer and the motormen of *the vessel*.

2.3 The information provided by the management company.

2.4 The management company’s incident investigation report.

3. Outline of events

(All times are local time UTC + 6 hours.)

3.1 At 0730 hours on 16 December 2016, *the vessel* completed cargo operation in the port of Chittagong, Bangladesh. *The vessel* then departed from the port and proceeded with her voyage at 1200 hours after disembarkation of pilot.

3.2 At 1300 hours, the second engineer together with the fitter and two motormen (Motorman A and Motorman B) had a tool box meeting in the engine control room to discuss the cleaning of a high sea chest strainer. The strainer cover was assembled with two anti-corrosion anodes and weighed about 275 kilogrammes.

3.3 At about 1307 hours, after removal of all the bolts of the strainer's cover, the cover was lifted by a chain block (Block 1) with a sling (Figure 2a). After the strainer was cleared, the cover was then shifted aside by another chain block (Block 2) (Figure 2b). While dangled loosely by Block 2, the cover was rested on the engine room platform at a position of about 2 metres away from the strainer (Figure 2c). The sling was made by using a plastic coated wire with an "eye" formed at each end by a bulldog grip (Figure 3).

3.4 At about 1315 hours, the fitter and Motorman A standing next to the strainer were trying to loosen the filter by using a crow bar (Figure 4). Suddenly the wire forming an "eye" at one end of the sling slid out of the bulldog grip causing the cover to topple over and fell towards the strainer (Figure 5).

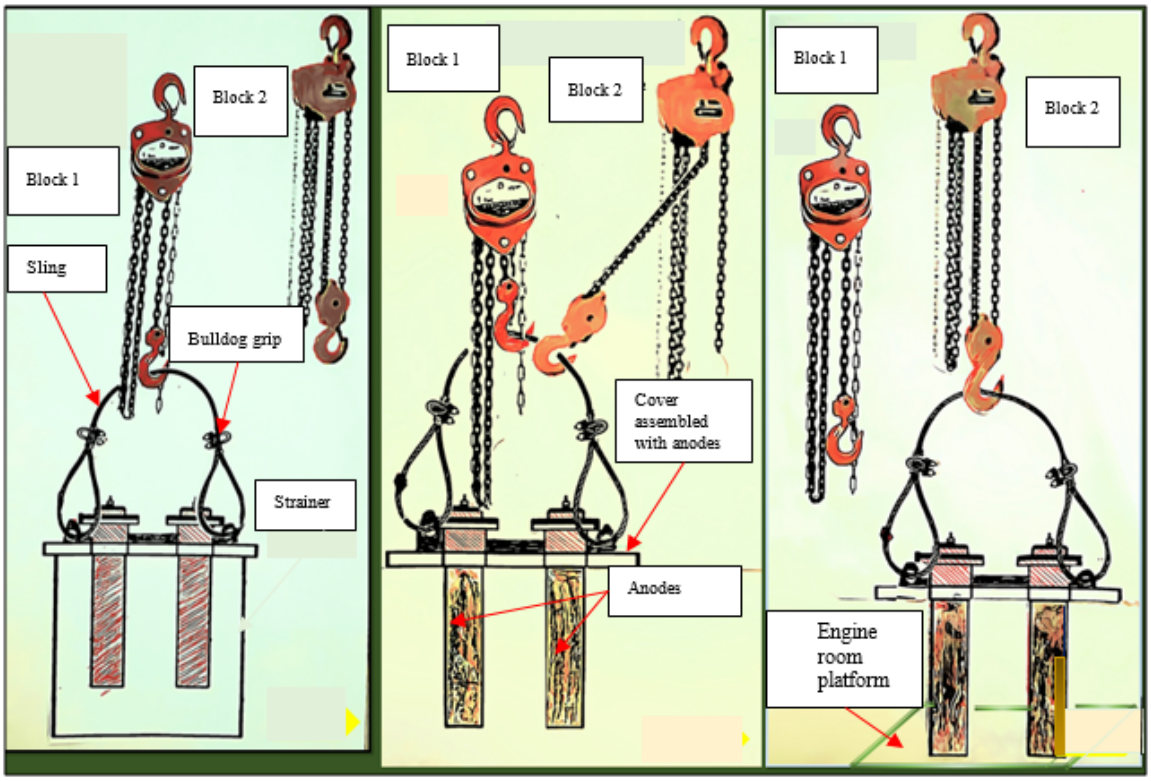
3.5 Upon landing on the strainer, the cover hit and crushed the fitter's head (Figure 6). Motorman A moved the cover away immediately and, together with the second engineer, carried the fitter to the deck floor.

3.6 At 1320 hours, the second engineer reported the accident to the master. The master instructed the crew to transfer the fitter to *the vessel*'s hospital for first aid treatment.

3.7 At 1335 hours, the master found that the fitter was seriously injured. He communicated with the Port Control and Bangladesh Coast Guard about the accident by VHF radio communication and returned *the vessel* to the pilot station of Chittagong as instructed by the Bangladesh Coast Guard.

3.8 At 1500 hours, *the vessel* anchored off Chittagong. At 1536 hours, the fitter was transferred to a coast guard boat which took the fitter to an ambulance ashore.

3.9 At 1730 hours, the fitter was transferred to a local hospital and declared dead on arrival.



Stage 1 Stage 2 Stage 3

a b c

Figure 2 Lifting of the cover assembled with anodes

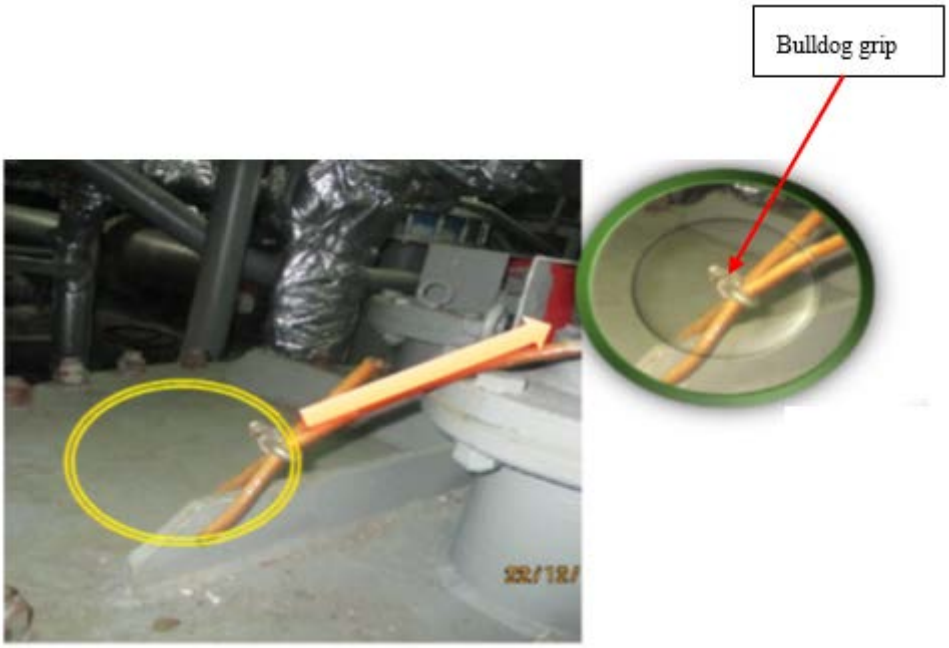


Figure 3 The sling

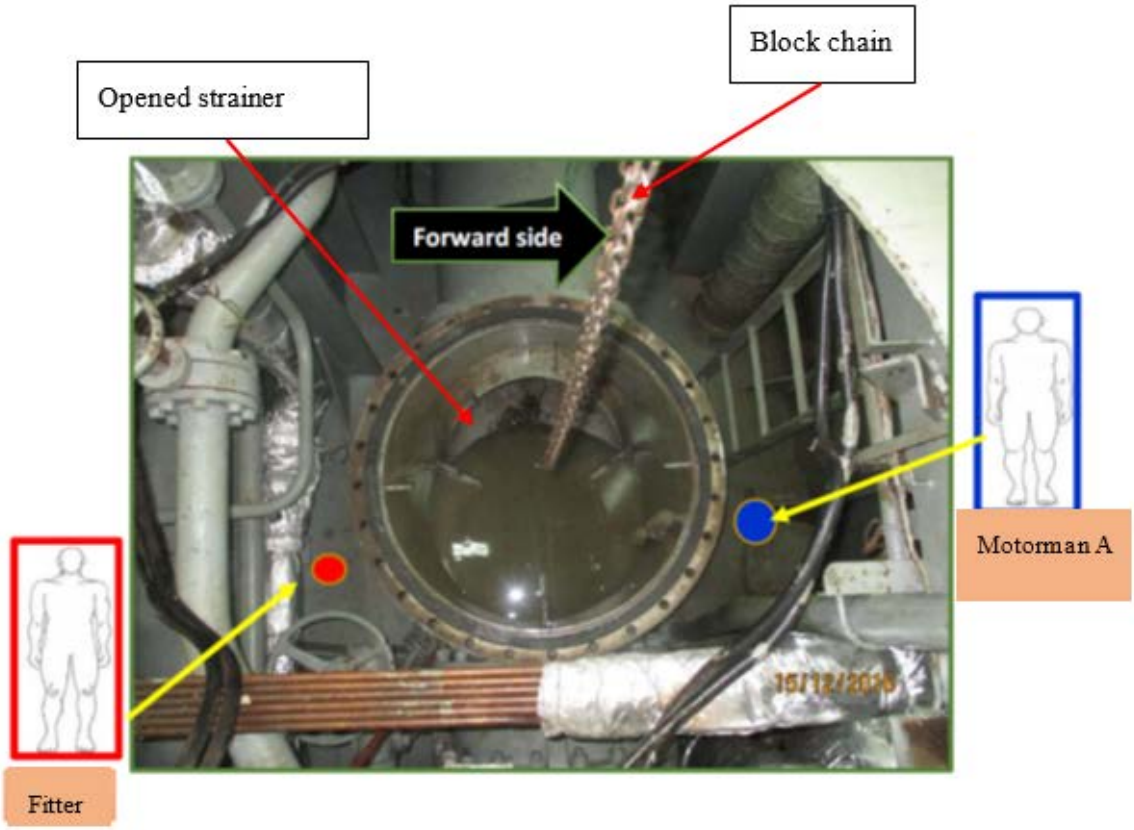


Figure 4 Positions of the fitter and Motorman A at the time of the accident

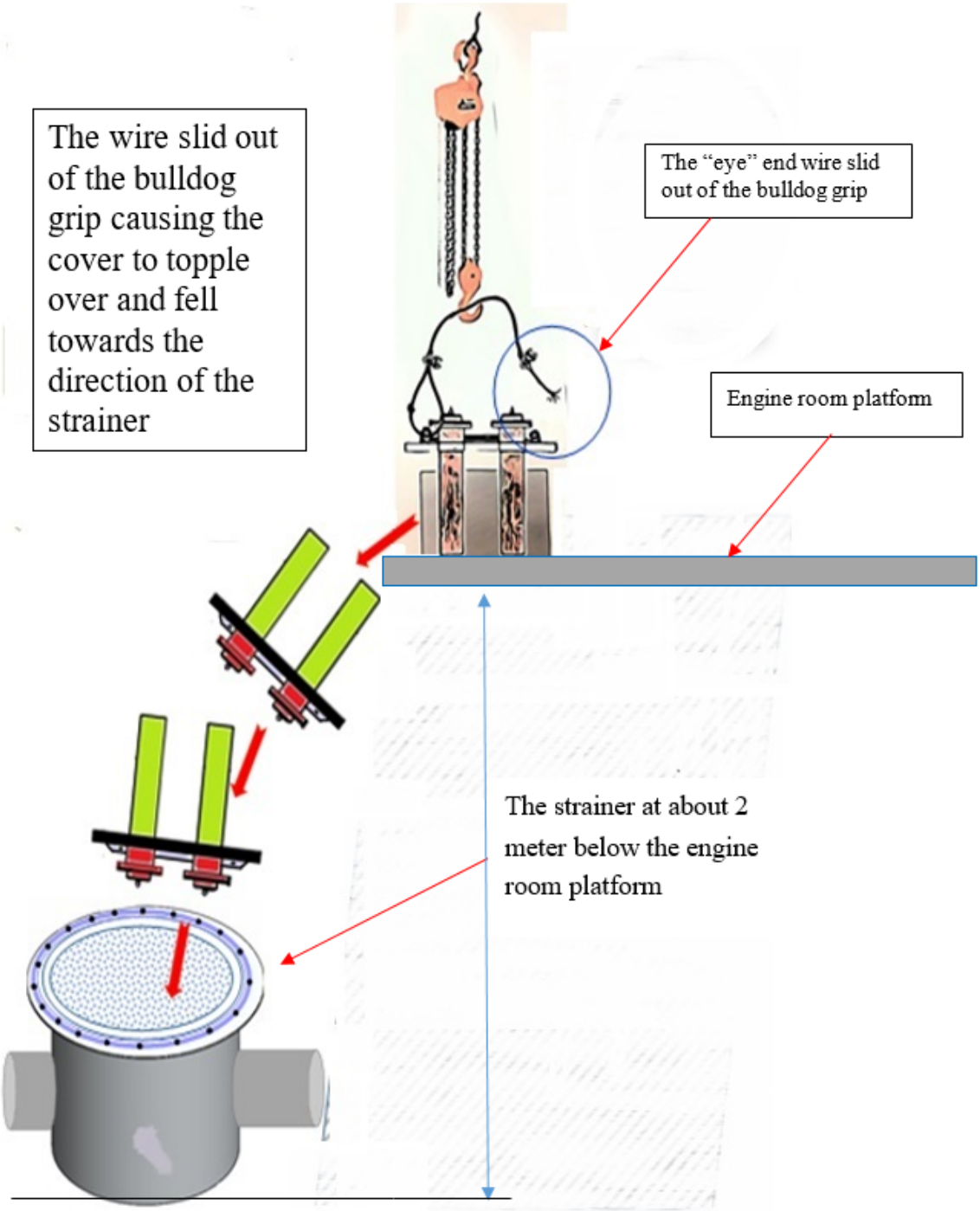


Figure 5 The wire slid out of the bulldog grip

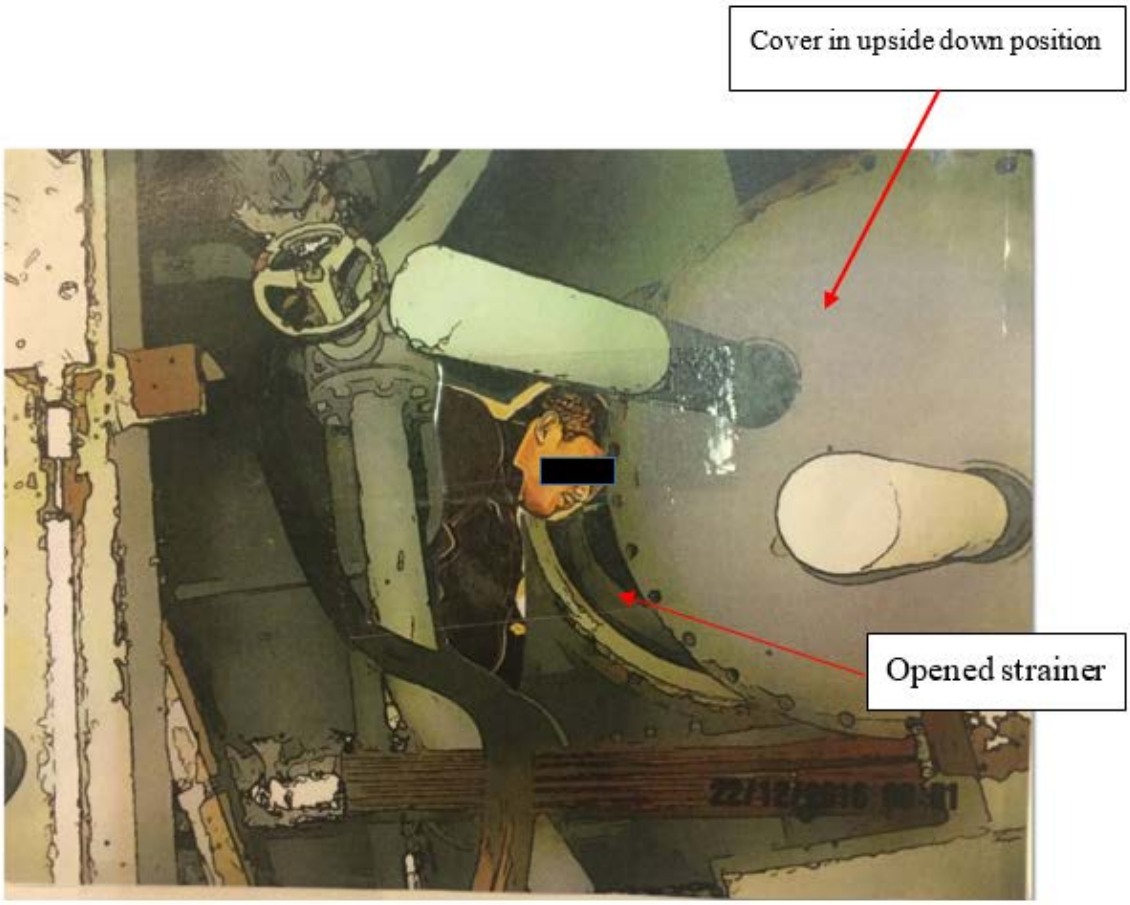


Figure 6 Illustration of the cover which hit and crushed the fitter's head

4. Analysis

Certification and experience

4.1 The master had worked for the shipping company for about 13 years. He had about 8 years' experience as master and joined *the vessel* on 1 October 2016. He held a valid Class 1 Licence (Deck Officer) issued by the Hong Kong Marine Department (HKMD) on 24 October 2016.

4.2 The chief engineer had worked for the shipping company for about a year. He had about 2 years' experience as chief engineer and joined *the vessel* on 5 December 2016. He held a valid Class 1 Licence (Marine Engineer Officer) issued by the HKMD on 8 December 2016.

4.3 The second engineer had worked for the shipping company for about 4 years. He had about 3 years' experience as second engineer and joined *the vessel* on 1 October 2016. He held a valid Class 1 Licence (Marine Engineer Officer) issued by the HKMD on 24 October 2016.

4.4 The fitter had worked for the shipping company as fitter for about 3 years. He joined *the vessel* on 21 October 2016.

4.5 Motorman A had worked for the shipping company for about 7 years. He held the rank of motorman for about 5 years and joined *the vessel* on 21 October 2016.

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

Weather and sea conditions

4.7 The wind was west-north-west force 2 to 3 and with the prevailing long swell sea condition in the Bengal Bay. In this weather, *the vessel* might roll slightly but there was no evidence to show that the weather was a contributory factor of the accident.

Working hours and alcohol/drug abuse

4.8 There was no evidence to show that any crew involved in the accident, including the deceased, suffered from fatigue at work, alcohol or drug abuse.

Cause of death

4.9 The post mortem report stated that there was no disease being detected morphologically. The injuries were ante-mortem in nature and were caused by either falling on hard projecting substance or falling of similar substance on the face and the head. The cause of death was due to injuries of head and face leading to injury of vital organ (brain) which was ante-mortem and consistent with the accident.

The sling and the lifting operation

4.10 The sling left behind by the shipbuilding yard had always been affixed to the cover since the delivery of *the vessel* on 31 October 2016. It was used to lift the cover by shipbuilding yard staff and engine room crew several times before the accident.

4.11 The ship management company promulgated the use of bulldog grips in the company's magazine "BSM Insight" issued in October 2016. In this "BSM Insight", a guidance on the application of bulldog grips (*the Guidance*) was provided (illustrated by Figure 7 and Figure 8) with critical contents extracted as follows:

a) to apply saddle part of the bulldog grip to the "live" load bearing wire and "U" bolt around the "dead" end;

b) to use minimum 3 bulldog grips for wires up to 19 mm diameter; and

c) to avoid applying bulldog grips over polyvinyl chloride (PVC) coated wires i.e. plastic coated wire. PVC coating should be removed prior to using the grips.

4.12 The sling used for lifting the cover in this accident did not comply with *the Guidance*. As shown in Figure 3, the "U" bolt was fitted at the "live" end instead of the "dead" end. Furthermore, only one bulldog grip, instead of a minimum of three, was used and the PVC coating was not removed prior to the use of the grip.

4.13 Starting from the time when *the vessel* was delivered, the engine room crew was not aware of the fact that the sling left behind by the shipbuilding yard for the cover had wrongly been assembled and therefore had kept on using it for several times to lift the cover until the accident happened.

4.14 A certified sling with ferrules crimps suitable for lifting the cover was available in the engine room workshop. Apparently, the engine room crew took the easy course of continually using the sling that had always been affixed to the cover without giving notice to *the Guidance* which required the use of certified sling.

4.15 Wires, shackles, nylon ropes, eyes and other gears for lifting purposes of unknown safety working load may be left by the shipbuilding yard. The engine room crew must be aware of the fact that lifting gears of unknown safe working load must not be used.

4.16 Further to the Guidance, the "Code of Safe Working Practices for Merchant Seafarers 2015" (*the Code*), which 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), has also provided the guidelines under paragraph 18.33.8 "Ropes" and Annex 18.2 "Bulldog grips" of Chapter 18 "Provision, Care and Use of Work Equipment". In general, *the Code* states that:

a) bulldog grips should not be used on lifting wires;

b) bulldog grips should not be used on plastic coated wires;

c) the "U" of the grips must be placed on the dead end of the

wires;

d) there should be at least 3 bulldog grips for a 8 mm diameter wire rope and the grips should be placed about 6 rope diameter apart with adequate numbers;

e) every lifting operation must be subject to risk assessment; properly planned; properly supervised and carried out in a safe manner; and

f) a load (the weight of the cover in this case) should not be put down in a position where it is unstable (the cover in this case was dangled loosely from the chain block).

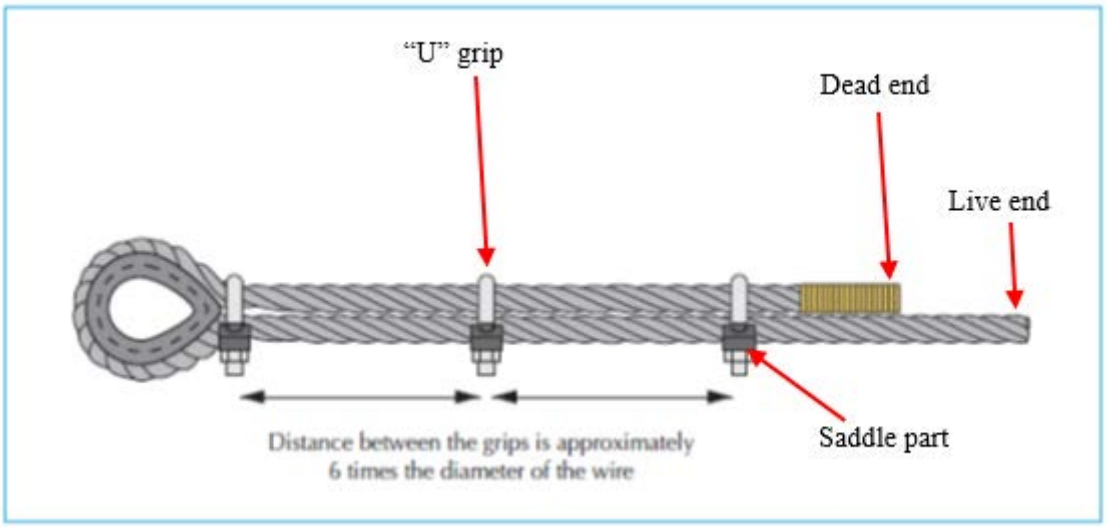


Figure 7 Typical wire assembly forming an "eye" using bulldog grip

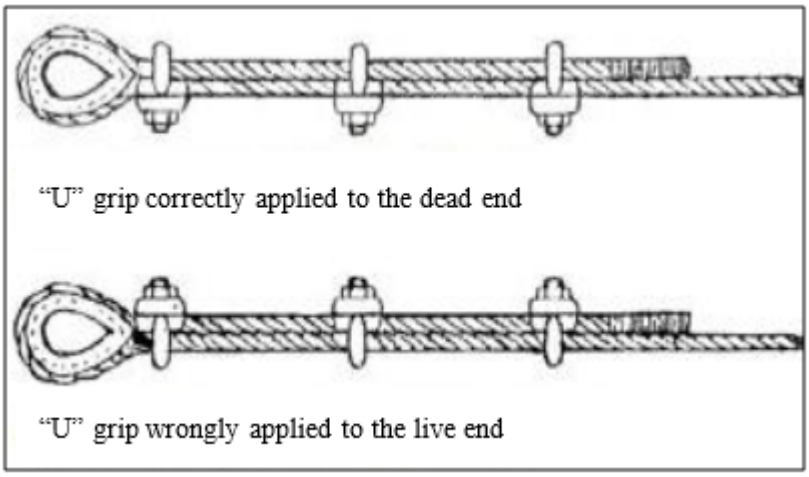


Figure 8 Correct versus wrong assembly

4.17 It is apparent that the second engineer, as a senior officer and the leader of the lifting team, had inadequate knowledge of lifting methods, the use of lifting gears and insufficient safety awareness. He had wrongly accepted to use a sling formed by plastic coated wire with only one bulldog fitted at each end and tied in wrong direction, not to mention that the wire should not be used in the first place.

5. Conclusions

5.1 On 16 December 2016 at about 1315 hours, a fatal accident happened on board *the vessel* at sea after her departure from the port of Chittagong, Bangladesh.

5.2 At that time, while the fitter and his colleagues were carrying out cleaning of the strainer, his head was hit by a falling cover which was dangled loosely by a sling and a chain block at about 2 meters away from the strainer. *The vessel* returned to Chittagong port. The fitter was sent to a local hospital and declared dead on arrival.

5.3 The investigation reveals the following contributory factors leading to the accident:

a) the engine room crew failed to carry out full assessment of the risks involved and the control measures required to lift a weighty strainer cover by making reference to the "Code of Safe Working Practices for Merchant Seafarers 2015" (*the Code*); and

b) the sling assembly including the fitted bulldog grips did not conform to the recommendations detailed in *the Code*, as follows:

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(ii) the bulldog grip was tied in a wrong direction; and

(iii) the wire used for forming the sling was plastic coated and was not suitable for lifting operation.

6. Recommendations

6.1 The management company of *the vessel* is recommended to:

a) issue notice/circular to draw attention of their masters, officers and crew to the findings of the investigation;

b) promulgate the company's procedures and Technical Operation Manual for lifting gears and lifting practices, in particular the application of bulldog grips; and

c) consider conducting internal audit to ensure that the company's procedures and instructions for lifting equipment are strictly followed by ship crew on board their fleet.

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 report had been sent to the master and the management company of *the vessel* for their comments.

7.2 During the consultation period, the management company advised that they had followed up the recommendations mentioned in paragraph 6.1 of the report. No comment was received from the master.