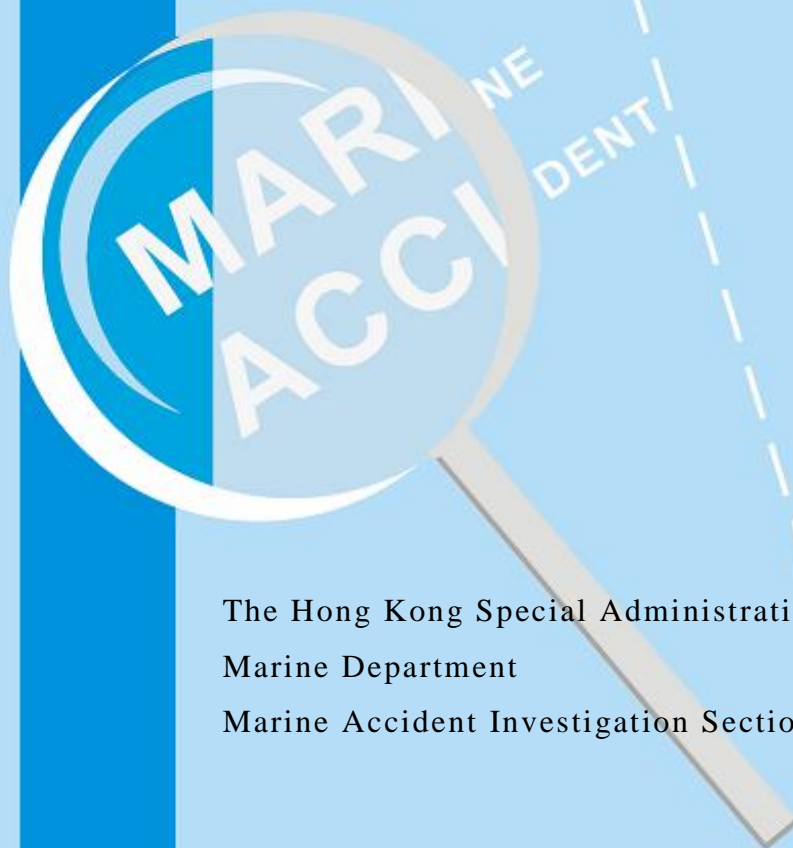




**Report of investigation into
the fatal accident on board
the Portugal registered
container vessel
“Northern Jupiter”
at Yiu Lian Dockyards,
Tsing Yi, Hong Kong
on 29 June 2017**



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

26 April 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 improving the safety of life at sea and avoiding similar incident 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.

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Summary

At about 0900 hours on 29 June 2017, a fatal industrial accident happened on board a Portugal registered container vessel “*Northern Jupiter*” (*the vessel*) which was under repair at the main pier of Yiu Lian Dockyards (*the Dockyard*), Tsing Yi, Hong Kong. Structural reinforcement work with carlings and T-shaped stiffeners was carried out in the steering gear room aiming to strengthen the underdeck structures in way of an unit of newly fitted mooring bitts on aft mooring deck. Two riggers (*Rigger 1* and *Rigger 2*) used two chain blocks (CB1 and CB2) to lift a T-shaped stiffener (*stiffener*) up to the underdeck plate for welding. The stiffener overturned, swung and struck the head of *Rigger 2* to his death.

The investigation revealed that the work of hoisting the stiffener had not been planned properly in advance. It was also revealed that the riggers were left alone to work without any safety instructions given and without any supervisor on site to monitor the work. The *Dockyard* was advised to follow the recommendations as given in paragraph 6.1 of this report.

1. Description of the vessel

1.1 *The vessel* (Figure 1)

1.1.1 Particulars of *the vessel*

| | | |
|----------------------|---|--|
| Ship name | : | <i>Northern Jupiter</i> |
| Flag | : | Portugal |
| Port of registry | : | Madeira |
| IMO number | : | 9466984 |
| Type | : | Container carrier |
| Year built, shipyard | : | 2010, Daewoo Shipbuilding, Geoje |
| Gross tonnage | : | 94,407 |
| Net tonnage | : | 54,884 |
| Length overall | : | 332.74 metres |
| Breadth | : | 43.20 metres |
| Engine power, type | : | 1 x Doosan-MAN B&W 10K98ME-C, diesel engine, MCR 57100 kW @104 rpm |
| Registered owner | : | Schiffahrtsgesellschaft MS “Northern Jupiter” mbH & Co. KG |
| Complement | : | 30 |



Figure 1 : *The vessel*

2. Sources of evidence

- 2.1 Interview records of the participating workers of *the Dockyard*.
- 2.2 The weather report from the Hong Kong Observatory.
- 2.3 The autopsy report from the Department of Health, Hong Kong.

3. Outline of events

- 3.1 On 29 June 2017, *the vessel* was moored alongside *the Dockyard* pier for repair. The weather was cloudy. The wind was Southeast Beaufort force 3 and the sea was calm.
- 3.2 To meet the requirements for Panama Canal transit, four units of additional mooring bitts were fitted on the aft mooring deck. Underdeck structural reinforcement work with carlings and stiffeners was carried out for each unit of these mooring bitts in order to support the loads transferred by the bitts (Figure 2).

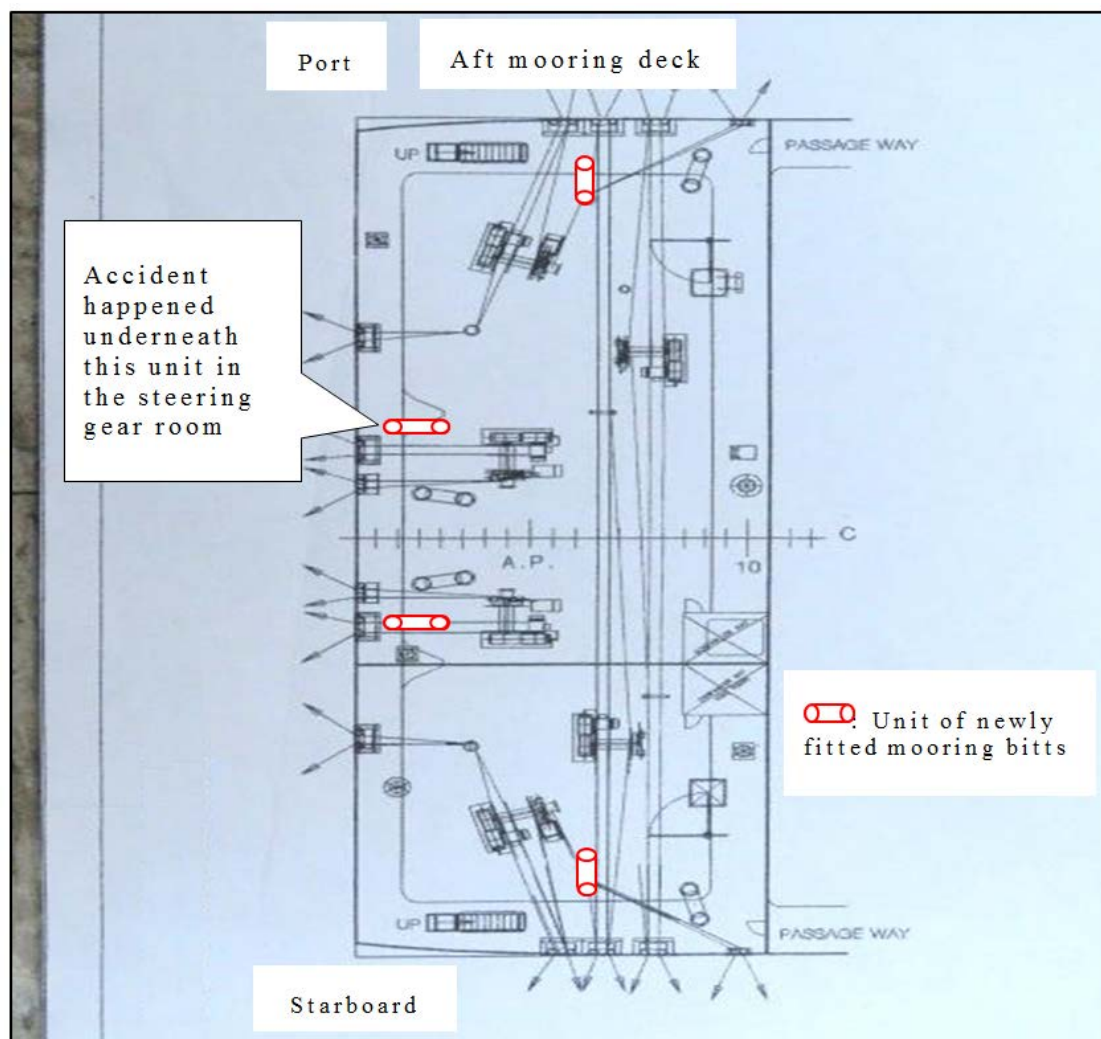


Figure 2: Locations of the four units of newly fitted mooring bitts

- 3.3 For the purpose of carrying out the structural reinforcement work, a staging was erected inside the steering gear room. *Rigger 1* and *Rigger 2* were assigned to carry out the work.
- 3.4 The structural reinforcement for each unit of newly fitted mooring bitt consisted of the following members:
- (a) four pieces of carling. Each carling was of dimensions: 800mm in length x 250mm in width x 16mm thick ; and
 - (b) two pieces of stiffener. Each stiffener composed of the web (2500mm in length x 300mm in width x 18mm thick) and the flange (2500mm in length x 150mm in width x 12mm thick) with weight of about 150kg. (Figure 3)

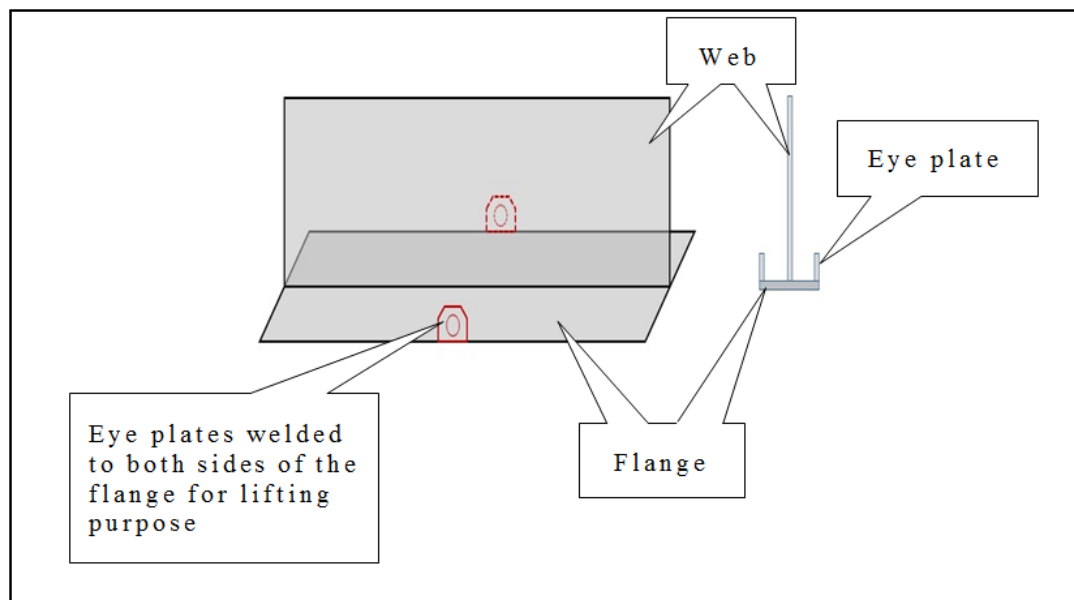


Figure 3: General configuration of the stiffener

- 3.5 To facilitate the structural reinforcement work, two lifting eye plates (Figure 4) were welded to the aft mooring deck underneath surface inside the steering gear room (the deck plate) to act as the anchor points for CB1 and CB2. The grabbing hooks of CB1 and CB2 were attached to the two eye plates (Figure 4) welded to the flange of the stiffener (Figures 3 and 4).

- 3.6 At about 0900 hours, *Rigger 1* and *Rigger 2* started the work to lift the stiffener up to the welding position at the deck plate.

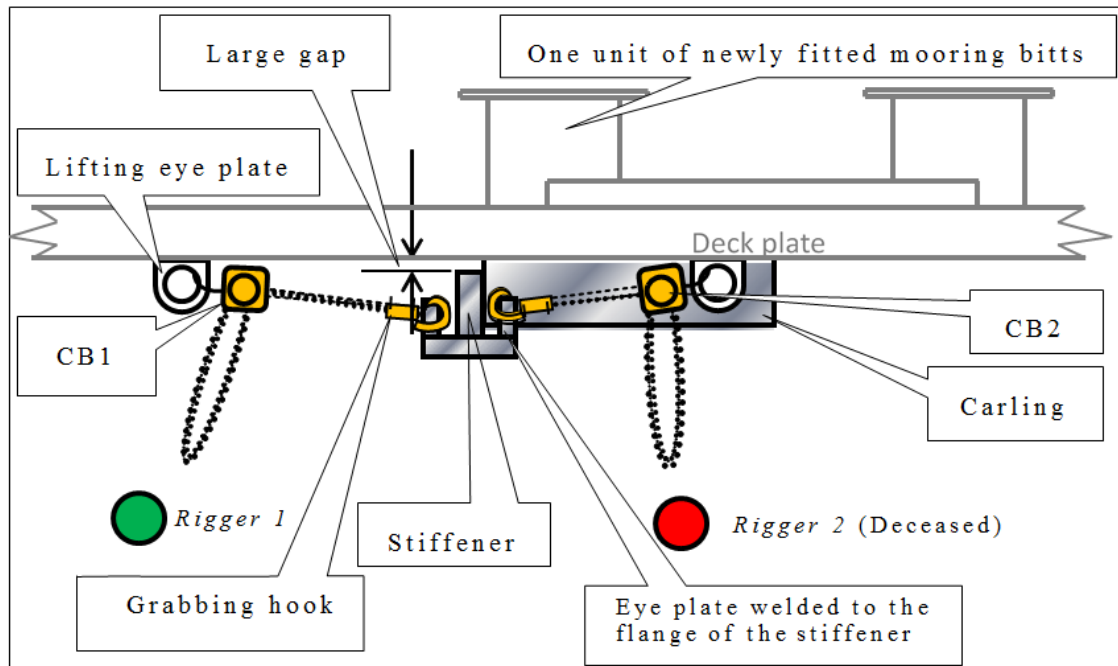


Figure 4: The initial hoisting arrangement of the stiffener by using CB1 and CB2

- 3.7 When CB1 and CB2 reached their extreme stops, however, the stiffener still fell short of reaching the deck plate with a large gap in between (Figure 4). *Rigger 1* and *Rigger 2* then decided to adjust the hoisting arrangement with the intention to lift the stiffener further up to close the gap.
- 3.8 The intended adjustment was that with CB2 still holding the stiffener in position, the grabbing hook of CB1 would be repositioned to the anchor point of CB2. In doing so, the chain of CB1 would run past the bottom of the stiffener. By tensioning the chain, it would then be expected that the lifting force created would lift the stiffener up further (Figure 5).

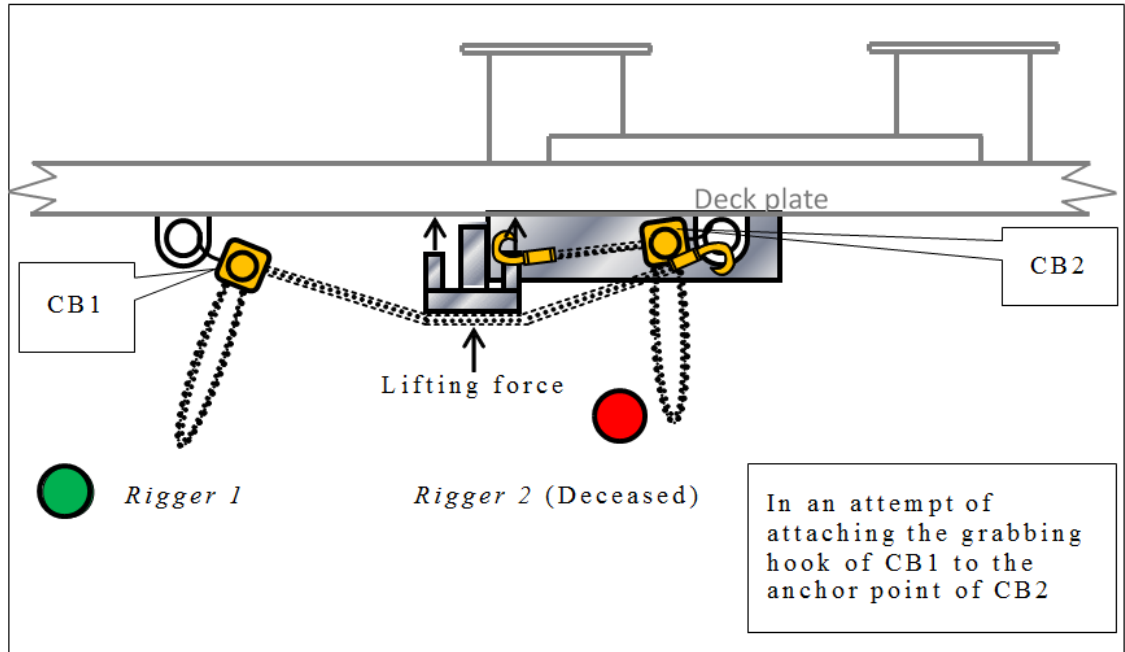


Figure 5: An illustration of the two riggers' attempt to change the hoisting arrangement with the intention to lift up the stiffener further

- 3.9 When the grabbing hook of CB1 was released, however, CB2 failed to hold the stiffener in position and the latter overturned, swung and struck the head of *Rigger 2* (Figure 6).

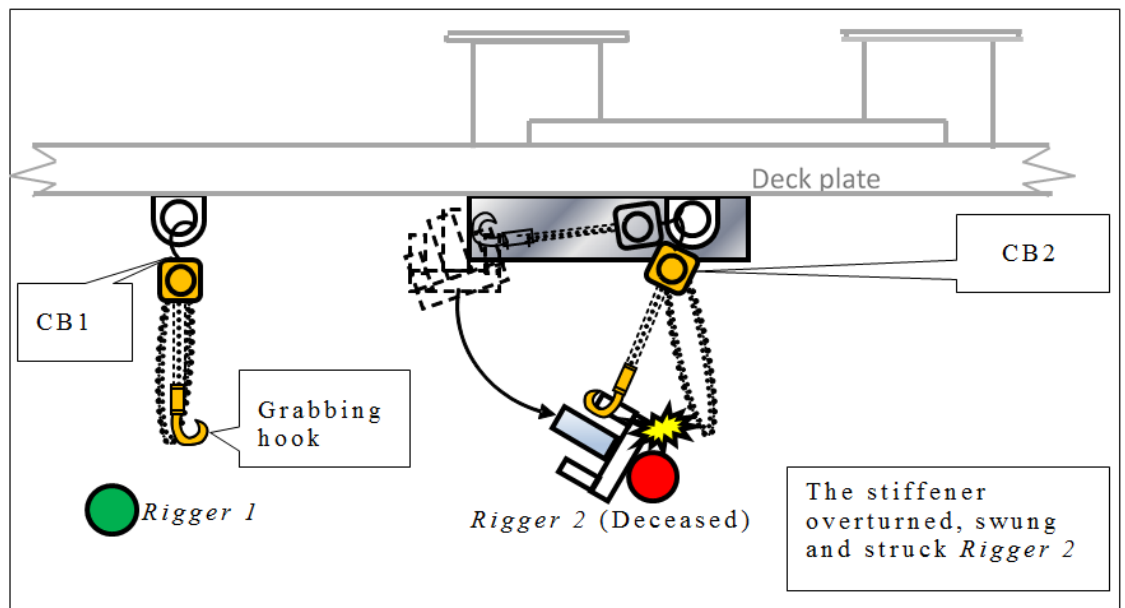


Figure 6: An illustration of the stiffener's movement when the grabbing hook of CB1 was released

- 3.10 *Rigger 2* was seriously injured and fell on the staging. He was taken to hospital immediately, but passed away after eleven days of intensive care in the hospital.

4. Analysis

Working experience and health condition

- 4.1 *Rigger 2* was an experienced worker. He worked for an engineering company and dockyards for a number of years and was familiar with dockyard working environment.
- 4.2 There was no evidence to show that *Rigger 2* had suffered from any fatigue of work or illness before the accident.
- 4.3 The autopsy report revealed that the direct cause to the death of *Rigger 2* was traumatic head injury.

Environmental factor

- 4.4 The weather was cloudy. The wind was Southeast of Beaufort force 3 and the sea was calm. There was no report for any perceivable movement of *the vessel* at the material time. Furthermore, the steering gear room was illuminated properly. The environment of the working site should not be a contributory factor to the accident.

Hoisting of heavy object

- 4.5 Without any supervision and safety instruction given and without any work plan in advance, the two riggers were left alone to handle their work. As a result, the initial hoisting arrangement had failed to position the stiffener to its fitting position (Figure 4 and para.3.7). In the attempt to adjust the hoisting arrangement, both riggers did not comprehend the situation that CB2 alone was not strong enough to hold the stiffener at its mid-air position (Figure 6 and para.3.9).
- 4.6 In order to prevent the risk of fall of the stiffener, an additional chain block or the use of an additional wire sling to secure the stiffener at its mid-air position should be ascertained before the release of the grabbing hook of CB1.

5. Conclusions

- 5.1 At about 0900 hours on 29 June 2017, a fatal marine industrial accident happened on board a Portugal registered container vessel at *the Dockyard* leading to the death of *Rigger 2*.
- 5.2 The investigation revealed the contributory factors to the accident as follows:
- (a) the work of hoisting the stiffener to its fitting position had not been planned properly in advance; and
 - (b) the riggers were left alone to carry out the work without any safety instructions given and without any supervisor on site to monitor the work.

6. Recommendations

6.1 A copy of the investigation report should be sent to *the Dockyard* advising them the findings of this accident. *The Dockyard* should act as follows:

- (a) to instruct their frontline staff to be vigilant about hoisting operation of heavy object;
- (b) to carry out work plan in advance by conducting risk assessment of heavy lifting to identify all potential hazards; and
- (c) to issue lifting plan for every heavy lifting operation to show the lifting method, safety instruction, equipment arranged and the number of people involved, handling of emergencies etc. A safety officer should be deployed as supervisor to ensure the safety of the lift.

7. Submission

- 7.1 The investigation report had been sent to the following parties for their comment:
- (a) *the Dockyard*;
 - (b) the ship management company of *the vessel*; and
 - (c) the Marine Industrial Safety Section of the Marine Department.
- 7.2 By the end of the consultation, there was no comment received from the above mentioned parties.