DUTCH
SAFETY BOARD

# Fatal Fall Overboard During Loading Activities

MS Clipper Champion, Rotterdam

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MS Clipper Champion, Rotterdam, 1st May 2014

*The Hague, May 2015*

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*Source photo cover: Dutch Safety Board*

## Dutch Safety Board

The aim in the Netherlands is to limit the risk of accidents and incidents as much as possible. If accidents or near accidents nevertheless occur, a thorough investigation into the causes, irrespective of who are to blame, may help to prevent similar problems from occurring in the future. It is important to ensure that the investigation is carried out independently from the parties involved. This is why the Dutch Safety Board itself selects the issues it wishes to investigate, mindful of citizens' position of independence with respect to authorities and businesses. In some cases the Dutch Safety Board is required by law to conduct an investigation.


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NB: This report is published in the Dutch and English languages. If there is a difference in interpretation between the Dutch and English versions, the Dutch text will prevail.

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# INTRODUCTION

In the port of Rotterdam, on 1 May 2014 at around 05:40 LT,[1] a fatal accident occurred aboard the seagoing vessel Clipper Champion. Whilst moving a hatch cover using the ship's crane, a crew member fell between the ship and dock and suffered fatal injuries. Two investigators from the Dutch Safety Board visited the site to investigate the situation immediately after the incident.

This involved a very serious accident as specified in the Casualty Investigation Code of the International Maritime Organisation (IMO) and EU Directive 2009/18/EC. Pursuant to the above, as the flag state, the Netherlands has the duty to arrange a safety investigation. This duty to investigate is also laid down in the *Besluit Onderzoeksraad voor veiligheid* ('Dutch Safety Board Decree').

1 LT: all times listed are local times

# FACTS AND BACKGROUND INFORMATION

**Circumstances**

On 30 April 2014, the Clipper Champion arrived in Rotterdam and docked in the Europahaven. The ship originated from Gijon (Spain) and was loaded with containers. After the arrival of the ship, the unloading of the cargo began. The stevedore team from the transhipment company was assisted by the ship's crew. Unloading was completed at the beginning of the evening and the ship crew had to prepare the ship to take on new cargo. The new cargo was scheduled to arrive at 07:00 LT the next morning (1 May 2014). To get the ship ready on time, it was necessary to work on board during the night. This work included moving the deck hatches. The ship had nine deck hatches placed on the hold in a fixed order. During loading or unloading, two locations were available to store the hatch covers: one on deck, near the accommodation, and the other at the front of the hold.

*Figures 1 & 2: Hatches, spreader and side-deck. (Figure 1: Source IL&T, figure 2: Source: Dutch Safety Board)*

At 05:48 am LT, the boatswain used the crane to move one of the hatch covers to the front. To guide the deck hatch, the sailors attached a rope to the hatch on both sides and walked along the side-decks in the direction of the bow. At that particular moment, the second officer, who was in charge of activities during the night, was at the gangway[2] and

2 A gangway or gangway has handrails and is used to board a ship. It was originally a rope with knots, along which one could climb to the ship's deck or descend into a boat or small vessel. Rope ladders on ships are still used for this purpose.

busy doing other work.[3] Whilst one of the sailors was walking forwards, he was blocked by a spreader placed on the side-deck on the starboard side. The 42 tonne spreader was there to help hoist heavy loads using both ship's cranes and the starboard side-deck was its default storage location. In order to guide the hatch further towards the bow, the sailor climbed on top of the spreader. He was holding the rope that was attached to the deck hatch cover.

At 05:53 LT the sailor lost his balance and fell overboard between the ship and the dock. The second officer at the gangway heard the splash and saw that the sailor was no longer on the spreader. The second officer walked to the quay wall and saw the sailor floating in the water with his head under water. He alerted the other crew members about the situation by radio. The currents pushed the sailor to some quay steps near the bow. At 06:03 LT the second officer was able to pull the sailor onto the quay with the crew who had rushed to help. The sailor was no longer conscious. The ship's captain alerted the emergency services and the sailor was taken to hospital. The sailor died of his injuries at 14:30 LT.

### Ship and Ship Owner

At the time of the accident, Clipper Fleet Management from Copenhagen, Denmark, was responsible for the International Safety Management (ISM) of about 175 ships, including the Clipper Champion (see appendix A). The Clipper Champion was built in 1998 at the Hudong-Zhonghua Shipbuilding Group in Shanghai, China, as Clipper Westhoe. Between 23 January 2012 and 20 January 2015 the ship sailed under the name Clipper Champion. The ship now has the name Grace Merchant and sails under the Korean flag. The ship is chartered[4] by Clipper Project management but is no longer managed by Clipper Fleet Management. The vessel has one hold with a total cargo capacity of 10,530 $m^3$. The hold has a depth of 11.67 meters. On the port side, the ship is equipped with two cranes, each with a Safe Working Load[5] of 32 tonnes.

### Crew

The minimum required crew for the Clipper Champion is twelve persons. At the time of the accident there were 15 crew members on board. All crew members had Russian or Ukrainian nationality. The official working language on board was Russian. The majority of the crew had been sailing for the ship owner for a significant period of time. All crew members had the required certificates of competency. The 48-year-old Ukrainian sailor who was killed during the accident was employed by the ship owner. He had extensive experience at sea. The sailor joined the Clipper Champion on 7 November 2013. Before this, he sailed aboard the sister ship Clipper Commander, amongst others.

3 The other activities consisted of checking the gangway and putting up a safety net.

4 Chartering: renting a ship for cargo transport at a specific price per tonne (the 'freight rate'). This makes it a charterer. The charterer can also be an independent party who rents a ship from the owner for a certain period, subletting the vessel to transport cargo for a profit (time charter). A ship broker (broker) mostly serves as a liaison between the ship owner and the charterer.

5 Safe Working Load: Safe Working Load (SWL), sometimes referred to as Normal Workload (NWL) is the maximum load in a particular weight unit that a piece of hoisting equipment can lift, keep at a certain height, or lower safely without the risk of the hoisting equipment breaking.

**The Deck Hatches**
Each deck hatch weighs about 29 tonnes. Aboard the Clipper Champion and her sister ships it is common to move the deck hatches using the ship's cranes. The crew attaches the deck hatch to the crane. The crane operator then lifts the deck hatch to just above the hatch coaming. Using a guide line on the port and starboard side, the crew members then guide the deck hatch into the desired position. These activities take place under the supervision of one of the deck officers.

**Spreader**
The spreader came from the sister ship Clipper Concord and was placed on board in December 2013. The spreader was part of the ship's fixed equipment from then on. The charterer of the ship, Thorco Shipping, ordered the placement of the spreader to provide the ship with more commercial value for project cargo. The spreader had not yet been used on board the Clipper Champion, however.

**Safety Management System**
The Clipper Champion and the ship owner had implemented a Safety Management System (SMS) certified by IACS Class BV according to the International Safety Management (ISM) Code. The most recent (external) audit on board took place on 18 February 2014. The Clipper Champion had also carried out a Risk Inventory & Evaluation (RI&E) in which the risks to health and safety on board as identified by the employer were recorded. The RI&E also included a summary of the measures taken to limit the risks as much as possible. The RI&E was prepared in-house.

*Figure 3: Take-five procedure. (Source: Dutch Safety Board)*

**Weather Conditions**

It was dry and partly cloudy in Rotterdam on the morning of the incident. There was some morning haze, however. As a result, the deck of the Clipper Champion was damp. The temperature was 8 degrees Celsius. There was a weak northerly wind with a force of 2 Beaufort.[6] There was no swell in the harbour. Sunrise on 1 May 2014 was at 6:16 LT. Dawn was breaking at the time of the incident (*civil twilight*[7] was at 05:35 LT).

6 The Beaufort scale is used to denote the speed of the wind. The scale was developed in 1805 by the Irishman Francis Beaufort. The scale is based on the force exerted by the wind per unit surface area, not on the speed, but on the ship. From 1838, it became common to use the Beaufort scale to indicate the force of the wind in the ship's log.

7 *Civil twilight* occurs when there is a transition from light to dark or vice versa. This happens at dawn (sunrise) and at dusk (sunset, nightfall). During twilight the sky is slightly illuminated, but the sun is below the horizon.

# ANALYSIS

The incident was analysed using the Tripod Method. The analysis assumes there was a failure in the safety facilities, also known as barriers. The analysis investigates what the direct and underlying causes of the failure of those barriers were.

**The Accident**

None of the crew members actually saw the sailor fall. According to witness statements, when the sailor was last seen, he was on the spreader with the rope of the deck hatch in his hands. CCTV[8] images from a camera positioned on a nearby property show that the sailor fell off the spreader while moving the hatches. It is not possible to see exactly why the sailor fell off the spreader, however. To guide the deck hatch further to the front, the sailor had no choice but to climb on the spreader, thus putting himself in danger of falling.

**The Spreader**

In the autumn of 2013, the charterer gave the captain of the Clipper Champion the order to take on the spreader of sister ship Clipper Concord. The owner of the ship knew about this order and agreed with it without checking the risks that this posed for the crew. After the decision was made to place the spreader on the ship, neither Clipper Fleet Management nor Thorco Shipping provided the captain with advice about the most workable and secure storage location of the spreader on board. For this reason, the crew of the Clipper Champion asked the crew of the Clipper Concord about her experience. She indicated that the starboard side-deck was the best position for the spreader. When the decision was made to place the spreader there, the shipping company did not identify the safety risks this posed for the ship and the crew. Therefore, there were no measures in place to address these safety risks. Before the accident occurred, the spreader had been on board the Clipper Champion for five months. During these five months, both the ship's crew and the ship owner had plenty of time to consider the position of the spreader on the side-deck and any hazards this could pose during routine ship operations.

**Safety Management**

The ship owner uses a comprehensive SMS. The SMS identifies the risks of a number of specific ship operations and determines safety management measures. The SMS also refers to the international Code of Safe Working Practices for Seamen (COSWP). And finally, the SMS prescribes a take-five[9] procedure. This procedure uses work meetings to increase the crew's awareness of any remaining or unknown risks. It looks like the implementation of these documents and procedures should have controlled any known and unknown risks on board the ship. Despite this, the risks posed by the position of the

8 CCTV stands for closed-circuit television camera and is also known as surveillance and camera surveillance.
9 See the work meeting section for a more detailed explanation.

spreader, which is dangerous when climbing or standing on top of it, remained uncontrolled for a long period of time.

### Hoisting Deck Hatches

In the SMS, the ship owner describes potentially hazardous activities, risks, and measures to control these. Working at heights and hoisting operations are identified as high-risk activities. One of the control measures described for hoisting operations is wearing a helmet. Hoisting deck hatches is not named as a separate risk. The crew indicated during the interviews that they regard this as a routine job. The SMS does indicate that the first officer must authorise lifting operations before they begin. For the risk management of general deck work, the SMS refers to the COSWP. It states that working at height brings with it the risk of falling and indicates the need to provide fall protection by fitting a safety net. Unlike the SMS of the Clipper Champion, the lifting of deck hatches is specifically mentioned in the COSWP. For example, the Code states that when cranes are required in order to place the deck hatches, crew members should not be exposed to any danger of falling. The COSWP also indicates that constant supervision is required during the hoisting of deck hatches. On the morning of the incident, none of these measures were put in place. There was no safety net, the sailor was exposed to the risk of falling, the first officer had not specifically authorised the hoisting operation and the supervising officer was carrying out other work on deck.

### Work Meeting

The SMS states that a work meeting or safety briefing must be held prior to starting work. On board, this safety briefing was commonly referred to as the 'take-five' procedure. This procedure encourages the crew to continuously reflect on their work and the corresponding safety risks. In the additional take-five instructions, the ship owner indicates that there is always 'time' for this procedure. Interviews make it clear that this procedure was not followed prior to moving the deck hatches.

### Personal Protection Equipment

The SMS states that each crew member is responsible for wearing appropriate personal protective equipment. The ship owner is responsible for providing this equipment. The standard equipment supplied to the ships consists of coverall, safety shoes, earmuffs, gloves, safety goggles, safety harness, crash helmets and a gas detector. Life jackets are not provided to each individual but are part of the ship's equipment. If it becomes evident that more personal protective equipment is needed on board, the safety officer can order this from the shipping company. According to the SMS, people should call each other to account when they notice they are not working safely. Witness statements and photos show that the sailor was not wearing a safety harness or a helmet. The sailor's coverall was in bad condition and his footwear was worn out. Neither the officers on board nor his immediate colleagues talked to the sailor about this.

*Figure 4: Work shoes of deceased sailor. (Source: IL&T)*

## Direct contributory factors (failing barriers)

- The ship owner did not make enough effort to assess and manage the risks of placing the spreader on board in advance.
- The risks associated with lifting and moving the deck hatches using the ship's crane were insufficiently controlled by the safety management system.
- The crew considered moving the deck hatches to be a routine job. As a result, the crew members did not discuss arrangements for moving the deck hatches on the morning of the incident.
- Little attention was paid to the sailor's safety equipment and the security risks associated with climbing on the spreader. The sailor did not wear any protective clothing: he was not wearing a life jacket, harness, or helmet, and his colleagues did not call him out on this.

## Factors that contributed to the incident:

- The shoes of the sailor were worn-out.
- Morning dew on the steel deck that did not have anti-slip paint.
- The uneven surface of the spreader. This surface is not designed to walk on.
- The spreader was not fitted with effective protection to protect the sailor against a 14 metre fall.

## Measures Taken by the Ship Owner

In response to the incident, ship owner Clipper Fleet Management has taken the following measures:

- The top side of the spreader on board the Clipper Champion was painted with fluorescent paint and has had anti-slip material applied.
- The accident was discussed by the safety committee.
- A safety audit[10] was held on board and extra training was given. The emphasis was on keeping up with the ongoing safety campaigns of the ship owner, including the 'take-five' safety programme and development of a safety culture on board.
- Fall protection has been provided by installing a safety net and fitting a guardrail near the spreader.

10 Safety audit: safety assessment on board by auditors employed by the organisation to check that the internal organisation is reliable and functioning as it should.

Furthermore, the captain has been told to talk to the charterer of the ship about removing the spreader from the ship. The ship owner has also issued specific safety instructions to all ships in the fleet that have a spreader on deck in a similar location. Finally, the ship owner has indicated that the safety procedures on board the Clipper Champion and other ships have been highlighted and that the other ships of the company have received a ‘lessons-learned report’.

# LESSONS LEARNED FROM THE INCIDENT

A ship is unsafe on its own. Getting people involved can make this platform a safe instrument. The ship's crew are appointed and carry out the operations as safe as possible. They are the experts, familiar with the operations and the risks involved.

The organisation has to deliver a final product in the best and efficient way as possible. This means that different facets of the job need to be streamlined. In the case of a ship, the ship owners will provide the ship's crews with the means to function as efficient as possible.

Most of the time this will result in a strain between the usage of those means and the framing of risks. It is up to the ship owners, the ships (crew or the ship itself?) and their employees to recognize this tension and to recover the balance. The success of an organisation depends on this balance as they are assessed on it. The ship owners, ships and their employees whom have the most success are those who are the most flexible. Flexible in such a way that the essential adjustments - work-arounds - and the connected side-effects, other risks, are recognized.

It is essential, that organizations continue to learn from their mistakes and to get acquainted with these failures. This is why it is not only important to concentrate on occurrences and the corrective measurements resulting from it, but it is also important to continue to improve the 'safety thinking' process. This implies an important role for safety monitoring and managing as management has a pioneering role. This role can be supported by the safety department. Therefore, it is import that this department observes, lists, studies and discusses safety discrepancies without legal consequences; even at moments in time when this seems imperative.

The accident onboard the Clipper Champion shows that the reality onboard and within the ship's company is not in accordance with the above. Against this background the Safety Board would like to emphasize the next lessons:

1. Ship owners have to be pioneers, and therefore have to initiate potential risks. A successful manner is to discuss these potential risks with the ship's crew and assess which risks are present and to what extent these are acceptable. It is important to involve all crewmembers, not only the master and first officer, but also for example the AB or the cook.
2. Ship owners have to guarantee sufficient attention for their own and each other's safety. Onboard of ships, a culture has to be developed where colleagues are able, and have the courage, to alert each other on unsafe attitudes leading to unsafe circumstances. Thereby, their own safety needs to be paramount. The ship owner managers have to set a good example. During ship visits, they have to use the correct protective gear, call the ship's crew to account when the correct safety attitude is not demonstrated and they have to encourage discussions regarding safety.

# APPENDIX A

## SHIP DETAILS CLIPPER CHAMPION

| | |
|---|---|
| Call sign: | C60H9 |
| IMO number: | 9169861 |
| Flag state: | Bahamas |
| Home port: | Nassau |
| Ship type: | General cargo with container capacity |
| ISM manager: | Clipper Fleet Management A/S |
| Classification society: | Lloyd's Register |
| Year of construction: | 1998 |
| Shipyard: | Hudong Zhonghua Shipbuilding Group Ltd., Shanghai, China |
| Length overall (LOA): | 100.5 m |
| Length between perpendiculars (Lpp): | 95.0 m |
| Beam: | 20.4 m |
| Actual draught: | 8.0 m (fore), 8.40 m (aft) |
| Gross Tonnage: | 6714 |
| Engines: | Wartsila 8L46B |
| Propulsion: | 1 screw - variable speed, 1 bow screw |
| Maximum propulsive power: | 7,900 kW |
| Container capacity: | 650 TEU |
| Maximum speed: | 16.5 knots |
| Ship's certificates: | All valid |

# APPENDIX B

## RESPONSES AFTER INSPECTION

A preview version of this report was submitted to the parties involved in accordance with the Rijkswet Onderzoeksraad voor veiligheid (Dutch Safety Board Act). These parties were asked to check the report for errors and lack of clarity. The preview version of this report was submitted to the following parties:

- Ship Owner Projectships LTD
- Captain Clipper Champion
- Sailor's next of kin

The received reactions were (if of relevance) implemented in the report. These are not announced separately.

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