



Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation
Federal Higher Authority subordinated to the Ministry of Transport,
Building and Urban Development

Summary Investigation Report 13/12

Very Serious Marine Casualty

**Death of a member of the crew of CMV
E.R. STRALSUND on 19 January 2012
en route from Algeciras, Spain, to
Tema, Ghana**

Summary Investigation Report 179/12

Serious Marine Casualty

**Injury to a member of the crew of MV
RED CAT on 1 May 2012 in the
port of Bremen**

6 September 2013

The investigation was conducted in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law - SUG) of 16 June 2002, amended most recently by Article 1 G of 22 November 2011, BGBl. [Federal Law Gazette] I, p. 2279, as amended.

According to said act, the sole objective of this investigation is to prevent future accidents and malfunctions. This investigation does not serve to ascertain fault, liability or claims.

This report should not be used in court proceedings or proceedings of the Maritime Board. Reference is made to the aforementioned version of Article 34(4) SUG.

The German text shall prevail in the interpretation of this investigation report.

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1 Summary of the marine casualty involving the E.R. STRALSUND

At between approximately 0850 and 0928 ship time¹ on 19 January 2012, a fatal work accident happened in the engine room en route from the port of Algeciras, Spain, to Tema, Ghana, off the coast of Morocco. A batch of steel plates stored upright tipped athwartship while being handled and trapped the victim between the plates and a pipe. The victim, who was unable to extricate himself from this position unaided, was found unconscious. There are no eyewitnesses to the incident. Immediately initiated attempts at resuscitation were unsuccessful.

¹ All times shown in this report, Ref.: 13/12, are ship time = UTC + 1

2 SHIP PARTICULARS: CMV E.R. STRALSUND

2.1 Photo

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Figure 1: Photo of the E.R. STRALSUND

2.2 Particulars

Name of vessel:	E.R. STRALSUND, ex Maersk Napier, ex Indamex Tuticorin, ex Maersk Mendoza
Type of vessel:	Container ship
Nationality/Flag:	Germany
Port of registry:	Hamburg
IMO number:	9194866
Call sign:	DPTL
Owner:	E.R. Schifffahrt GmbH & Cie. KG
Year built:	1999
Shipyard/Yard number:	Volkswerft Stralsund/VW 424
Classification society:	Germanischer Lloyd
Length overall:	207.40 m
Breadth overall:	29.80 m
Gross tonnage:	25,630
Deadweight:	33,694 t
Draught (max.):	11.40 m
Engine rating:	19,810 kW
Main engine:	MAN B&W 7L 70 MC
(Service) Speed:	21.6 kts
Hull material:	Steel

2.3 Voyage particulars

Port of departure:	Algeciras, Spain
Port of call:	Tema, Ghana
Type of voyage:	Merchant shipping, international
Cargo information:	27,557 t, containers
Manning:	19
Draught at time of accident:	11.05 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	None

2.4 Marine casualty or incident information

Type of marine casualty/incident:	VSMC, fatal work accident
Date, time:	19/01/2012, approx. 0850 to 0928
Location:	Atlantic Ocean, coast of Morocco
Latitude/Longitude:	ϕ 31° 11.7'N λ 010° 43.8'E
Ship operation and voyage segment:	Open sea
Place on board:	Engine room
Human factors:	Yes, human error

Consequences (for people, ship, cargo, environment, and other): Death of a crew member

Excerpt from Nautical Chart BA 3133

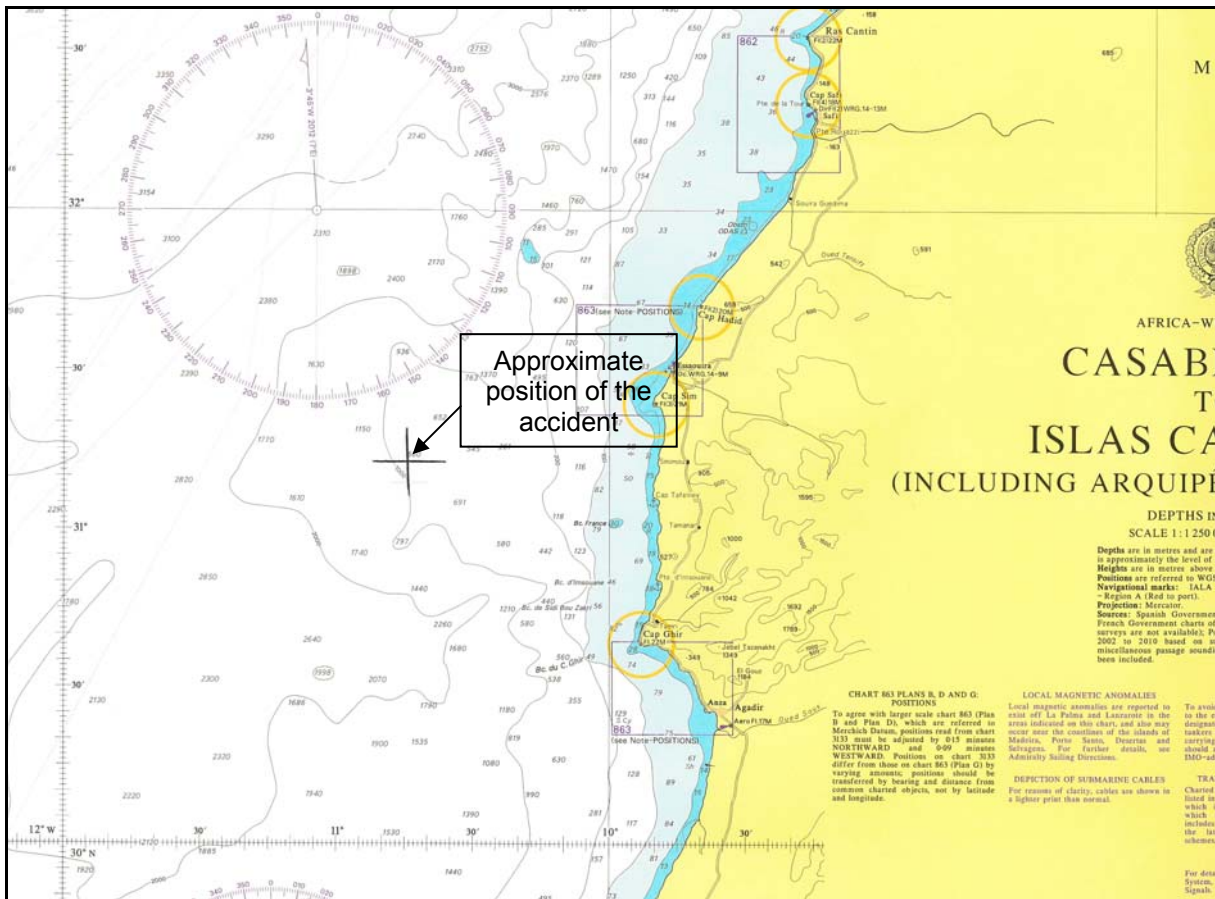


Figure 2: Nautical chart

2.5 Shore authority involvement and emergency response

Agencies involved:	MRCC Madrid, MEDICO Cuxhaven
Resources used:	Medical advice by radio
Action taken:	First aid at the scene, mechanical ventilation, resuscitation attempt
Results achieved:	Casualty died on board

3 COURSE OF THE ACCIDENT AND INVESTIGATION

3.1 Course of the accident

The E.R. STRALSUND was en route from Algeciras to Tema, Ghana, on 19 January 2012.

A routine repair was carried on the ventilation fan of the control room's air conditioning unit. The ventilation fan's casing had to be cut open and subsequently closed with a new galvanised thin steel sheet. As a fitter, the casualty was assigned to carry out this work together with an electrician. At about 0900, the casualty went to the steel sheets and plates stored in the engine room on his own initiative, apparently to obtain a new sheet. At 0930, the casualty was found unconscious and unresponsive in the engine room trapped between steel plates and a pipe by the second engineer. He was unable to extricate himself from this position unaided. A galvanised steel sheet was laying on the floor next to the casualty. There were no eyewitnesses to the incident.

Laying at an angle on the casualty, the steel plates weighed about 700 kg and could only be pushed back to their original, upright position with the help of several crew members.



Figure 3: Location of the casualty

Immediately initiated cardiopulmonary resuscitation (CPR) was unsuccessful. The master was at the scene of the accident by about 0945 and gave an order to continue applying CPR. MEDICO Cuxhaven also recommended this on being consulted by phone.

Since consultation with MRCC Madrid revealed that evacuation by helicopter would not be possible, the heading was set for Agadir at about 1000 and an order was given to proceed at best speed. Since CPR was unsuccessful, the recorded time of death was 1100 and CPR was discontinued at 1105 following another conversation with MEDICO. The deceased was then taken to the hospital.

The anchor was let go off Agadir at about 1430. Three Moroccan police officers, the German consul, and a local agent boarded at 1725 for the investigation.

The deceased was evacuated and all the local visitors left the ship at 2115.

At about 2140, the anchor was weighed and the voyage continued to the port of destination without further incident.

3.2 Investigation

The Federal Bureau of Maritime Casualty Investigation was informed about the fatal accident in the engine room and ensuing events promptly on the day of the accident. All parties cooperated with the BSU transparently and in the spirit of trust. The VDR and ECDIS recordings were available to the BSU for the investigation.

An investigation was carried out on board the E.R. STRALSUND in the port of Algeciras on 13 February 2012. The following photos were taken during this investigation.



Figure 4: Ventilation fan with closed steel sheet

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The air conditioning unit in the control room was closed with a thin galvanised steel sheet when the survey was carried out. These thin steel sheets were stored upright together with thick steel plates lashed to two steel supports opposite the piping for the main engine's fuel oil mode in the engine room.

Storage position of the steel plates in the engine room:

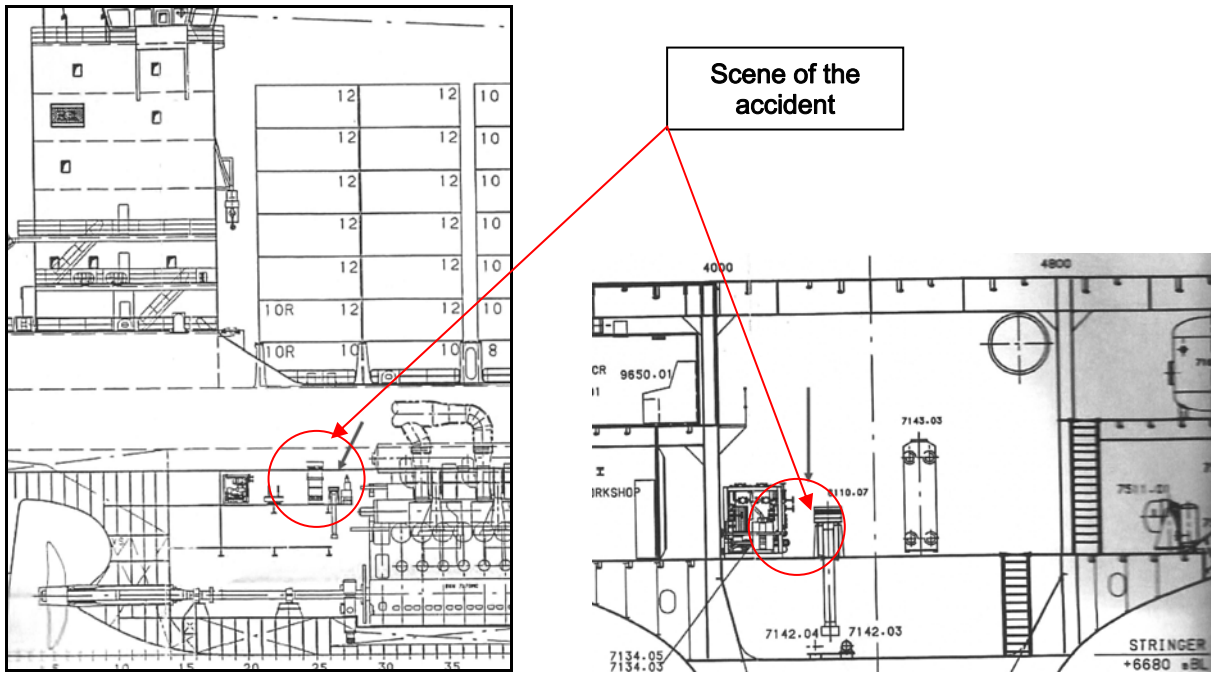


Figure 5: Storage, view from above



Figure 6: Storage, view towards the bow

At the time of the survey, the plates were secured by an additional wire and chain block, as well as a bolted angle.

The roughly 2.50-metre long bolted steel angle (securing angle), which was not there on the day of the accident, is visible in Figure 6. The steel plates were stored upright and secured only by a chain block and wire sling.

3.2.1 Witness statements

A detailed accident report, which was signed by every witness, was prepared by the master two days after the accident.

On the morning of the accident, the later deceased had worked in the engine control room (ECR) together with an electrician. One of the air conditioning system's units was making odd noises and instructions for it to be disassembled and serviced were given by the second engineer. The discussed work schedule consisted of opening the casing by means of an angle grinder, inspecting the ventilation fan and repairing if necessary, and closing the casing again using a thin galvanised steel sheet after the repair. As the work was progressing, the casualty reportedly left the ECR, supposedly to get a drill. In fact, he left the ECR to collect an appropriate steel sheet to close the opening from the batch of vertically stored plates. During his tour of the engine room, the second engineer discovered the lifeless fitter trapped under steel plates. A thin steel sheet lay on the floor about two metres in front of him and the chain block used for securing the steel plates was unfastened. It appears that he was not trapped until after he had taken the thin steel sheet from the upright batch of steel plates.

The casualty was described as a very reliable and affable seaman, who was normally on time or even a few minutes early.

The ship was only rolling gently at the time of the accident.

3.2.2 Weather report

The official weather report on the wind and sea conditions for the period 0750 to 0830 in the sea area off the coast requested from the Maritime Division of Germany's National Meteorological Service (DWD) contains the following summary:

The scene of the accident was on the southern flank of a comprehensive and practically stationary high pressure area concentrated west of Portugal and over central Spain. A force 4 to 5 Bft easterly wind prevailed, which slowly dropped to 3 Bft and at the same time turned slightly right. There were no gusts of force 6 Bft or above.

For the sea state, it was determined that the wind sea's significant wave height dropped from 0.5-1.0 m to less than 0.5 m. The significant swell waves from the north (periods of 10 s) reached heights of about 2.5 m. Here, the occurrence of solitary wave heights of 3.0-3.5 m is likely.

4 ANALYSIS

In the course of the investigation, there was no indication of the involvement of another person.

It appears that the casualty wanted to obtain a thin steel sheet alone and without being instructed to close a ventilation fan. This steel sheet was stored upright in the engine room together with other thick steel plates and secured only by a chain block and steel wire. A steel angle intended as a means of securing by using bolts on the rack was not in position as a securing device. The casualty apparently released the chain block and wire sling and pulled the thin steel sheet out of the batch of steel. It is likely that the upright thick steel plates tilted due to the rolling motion of the ship and trapped the casualty against a pipe.

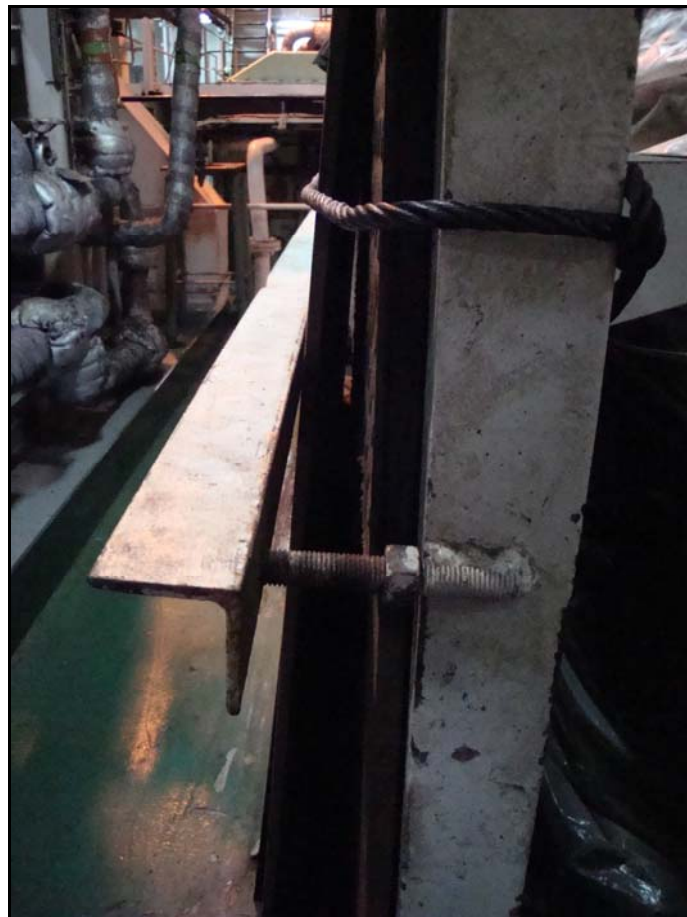


Figure 7: Securing device with bolted steel angle

This means of storage was originally intended for only a limited, small number of steel plates. The length of the bolt used to secure the steel angle has already reached its limit, meaning no more plates can be stored.

5 Action taken by the owner after the accident

The entire fleet belonging to the owner was informed about the accident and its causes by means of the following safety bulletin. An existing risk assessment for the safe handling of metal plates has been revised and made available to all ships. The ships were instructed to check the metal plates for safe and proper storage and modify if necessary. All quality managers were instructed to check the metal plates for proper storage during internal audits on board.



E.R. SCHIFFAHT

Safety & Quality

- Bulletin -

Bulletin No. 2012 - 001
08 March 2012

Fatal accident caused by tilting pile of steel plates

Fitter squeezed in between steel plates and a pipe of the main engine fuel station.

The Fitter was assigned to assist the Electrician in repairing the malfunctioning stand-alone air condition unit in the engine control room on the 2nd deck while the ship was underway. When the Electrician attempted to repair the stand-alone air condition unit in the engine control room, assistance was requested for necessary metal works.

The Chief Engineer instructed the 2nd Engineer to arrange such assistance by advising the Electrician to call the Fitter off his current job, to which he had been assigned by the Second Engineer during the morning briefing.

The Fitter and the Electrician – in the meantime working alone in the Engine control room – continued the repair work at the air condition unit. In order to close a cut-out in the air condition unit housing, holes were drilled to mount a steel sheet with rivets. The Fitter left the engine control room to the engine room but did not address what exactly he intended to do.

About 45 minutes later, when passing from starboard side to portside on the platform deck (dotted blue line), the Second Engineer discovered the body of the Fitter trapped in an upright position between a stack of steel plates/sheets, which had tilted from its original position towards the portside, and a pipe of the main engine fuel station.

The steel plates reached as high as the Fitter's collar-bone while the head had tilted forward and rested on the foremost plate. There were no vital signs noted when the body was found. An intact wire and chain block, used as lashing devices to secure the stack of steel at constructional corner posts, were found lying on the deck close to the accident site. The Second Engineer informed the Officer on the bridge and the Fitter was freed from

the steel sheets after help had arrived at the scene. Resuscitation measures were initiated and the German Telemedical Centre was contacted for support. Unfortunately, all resuscitation efforts remained without success.



FINDINGS:

The method of storage and securing the stack of steel sheets was not appropriate: When trying to remove a single steel sheet, all securing arrangements had to be released, leaving the whole stack unsecured, potentially unsafe and not protected against ship movements.

Fitting a securing bar would – to a certain extent – have provided a more practical securing solution as it would have made it possible to remove single sheets without the need to dismantle the entire securing arrangement. However, had the securing bar not been in use anymore for a prolonged time.

The securing equipment (wire and chain block) was not suitable as protections had neither been placed at the edges of the stored steel sheets nor at the constructional posts to which the steel wire was fastened. Without any protection, the steel wire suffers from bending and consequentially weakens.

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The steel sheets were not stored on an anti-skid surface (e.g. flat timber bars) to minimize their movements.



The Fitters' Superiors were occupied with other tasks and apparently delegated the planning and execution of the repair job to the Rating himself. A detailed plan of the work scope or work sequence had not been given as the job appeared to be a routine task and the hazard of the unlashed steel sheets, being stored in parallel to the ship's longitudinal axis, had been misjudged by the Fitter. The intended removal of the galvanized steel sheet was neither addressed to any crew member by the Fitter nor had any colleague been asked for help while an inappropriate method of securing the stack of steel sheets was in place for already a long time and had never been identified and considered as a danger by the Safety Wardens or any other crew member.

REASON:

Cause of the accident was the inappropriate storage arrangement of the stack of steel sheets as it did not allow that a single sheet could be removed without undoing the complete securing arrangement and that the other steel plates are protected from uncontrolled and unexpected movements. External conditions such as the vessel's movements have caused the remaining stack of sheets to tilt.

LESSON TO LEARN:

For delegated tasks it has to be ensured that the job scope, the job sequence and details are properly planned and clearly communicated by the Superiors to the involved persons and that the correct execution is effectively supervised and verified.

Storage places of steel sheets are to be reviewed and, if necessary, to be replaced by safe storage racks in order to ensure that a single steel sheet can be safely removed while the remaining stack of sheets remains secured.

6 Summary of the marine casualty involving the RED CAT

At about 0900 local time² on 1 May 2012, a work accident in which a crew member suffered injuries to his chest and one leg occurred on board the MV RED CAT in the port of Bremen.

During securing operations on steel plates stored in an upright position, they tipped over and partially buried a crew member.

² All times shown below are Central European Summer Time = UTC + 2

7 SHIP PARTICULARS: MV RED CAT

7.1 Photo



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Figure 8: Photo of the RED CAT

7.2 Particulars

Name of vessel:	RED CAT, ex Safiya
Type of vessel:	Cargo ship
Nationality/Flag:	Panama
Port of registry:	Panama
IMO number:	8814342
Call sign:	3FOA5
Owner:	Nepunus SA, Switzerland
Year built:	1990
Shipyard/Yard number:	Jurong Ltd. Singapore/Mo. 035
Classification society:	LR
Length overall:	115.82 m
Breadth overall:	15.80 m
Gross tonnage:	4,371
Deadweight:	5,955 t
Draught (max.):	6.08 m
Engine rating:	3,523 kW
Main engine:	Yanmar 2 x 8Z280-ET
(Service) Speed:	13.0 kts
Hull material:	Steel

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7.3 Voyage particulars

Port of departure:	Freetown
Port of call:	Bremen
Type of voyage:	Merchant shipping, international
Cargo information:	General cargo
Manning:	14
Draught at time of accident:	5.40 m
Pilot on board:	No
Canal helmsman:	No
Number of passengers:	None

7.4 Marine casualty or incident information

Type of marine casualty/incident:	LMC, work accident with injuries
Date, time:	01/05/2012, approx. 0900
Location:	Bremen, Harbour Basin A, Dolphin 3
Latitude/Longitude:	ϕ 53° 07.1'N λ '008° 43.9'E
Ship operation and voyage segment:	In port
Place on board:	Poop deck
Human factors:	Yes, human error

Consequences (for people, ship, cargo, environment, and other): Injury to crew member

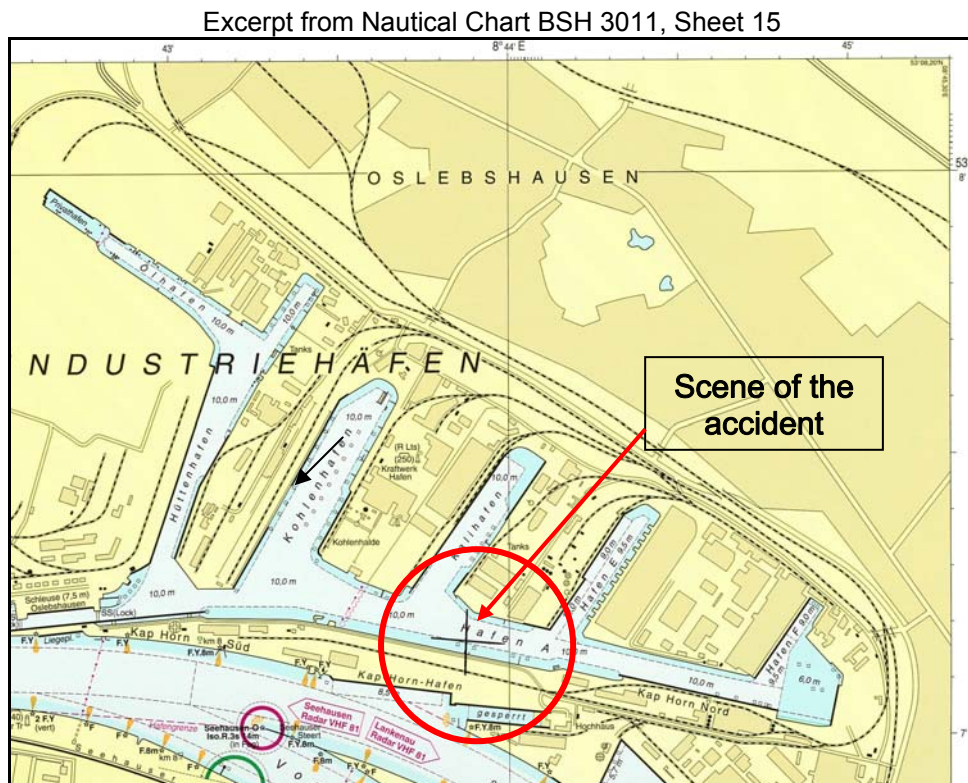


Figure 9: Nautical chart

7.5 Shore authority involvement and emergency response

Agencies involved:	WSP, ambulance, fire brigade
Resources used:	Ambulance, fire engine, fire brigade crane
Action taken:	First aid at the scene, evacuation by stretcher
Results achieved:	Casualty taken to a hospital. No complications

8 COURSE OF THE ACCIDENT AND INVESTIGATION

8.1 Course of the accident

The RED CAT was moored according to instructions on 1 May 2012 in Harbour Basin A, Dolphin 3, Bremen. Together with a second crew member, a 55-year-old seaman wanted to replace a torn tarpaulin on the poop deck at the rear edge of the superstructure, which was covering steel plates stored there upright. In the process, the steel plates partially tipped over and buried the casualty, causing him to suffer contusions in the chest area and an open fracture on his right leg.

8.2 Investigation

The Federal Bureau of Maritime Casualty Investigation was informed by the waterway police one day after the accident. It was also made aware by the flag State, Panama, which did not wish to carry out its own investigation.



Figure 10: Aft section of the RED CAT

The scene of the accident was on the main deck at the rear edge of the superstructure where approximately 20 1.4 m x 1.2 m steel plates with a thickness of 5-10 mm were stored upright. These plates probably weighed some 1,000 kg. The plates were resting vertically on the superstructure of the ship and secured by only one lashing strap.



Figure 11: Steel plates on the superstructure

The casualty was employed as an able bodied seaman and was to replace the torn blue tarpaulin together with another crew member. After the single lashing strap used to secure them was released, a number of steel plates became unsteady, tipped forward one after the other, and partially buried the casualty. Only with the assistance of other crew members was it possible to remove the plates. First aid was administered until the arrival of the emergency physician. The casualty was taken to hospital to receive further treatment for the contusions suffered in the chest area and fractured leg.

9 ANALYSIS

Inquiries as to why the steel plates were stored at the rear edge of the superstructure were not made during the investigation. However, it can be assumed that it concerned steel plates used for repairs on board. The special mounting rings welded to the superstructure indicate that storage of the steel plates is permanent rather than temporary:



Figure 12: Ring for lashing strap

The above photo shows that the plates are almost vertical. The rearward inclination of the plates becomes even more extreme when the ship is trimmed by the stern with a large aft draught. It can be anticipated that the plates will tilt again when they are released.

Securing with only one lashing strap also raises doubt as to whether the steel plates will remain in their upright position in heavy swell.

10 Conclusions from the two accidents

The two accidents are summarised in this investigation report because in both cases the triggering event was the improper, vertical storage and securing of steel plates. Both accidents could have been prevented by other and/or additional securing measures.

To use steel wire, a textile lashing strap or rope to secure plates in a vertical position so as to prevent them tilting can only be regarded as temporary, not permanent. Utmost care must be taken when releasing such a securing device. If single steel plates are required, then the entire batch of plates always has to be released and it is impossible to prevent them from tipping.

One measure to prevent tipping would be the assembly of additional, permanently welded vertical supports or to store everything in a rack with at least two supports on each side. If the plates are additionally secured on the floor against slipping, e.g. using wooden underlays, then the risk of accidents due to vertically stored steel plates would be minimised significantly.

11 SOURCES

- Enquiries by the waterway police (WSP)
- Written statements
 - Ship's command
 - Owner
 - Classification society
- Witness accounts
- Reports and technical paper
- Nautical charts and ship particulars, Federal Maritime and Hydrographic Agency (BSH)
- Official weather report by Germany's National Meteorological Service (DWD)
- Radar recordings, ship safety services/vessel traffic services (VTS)
- Documentation, Ship Safety Division (BG Verkehr)
 - Accident Prevention Regulations for Shipping Enterprises (UVV-See)
 - Guidelines and codes of practice
 - Ship files