



DANISH MARITIME AUTHORITY



**MARINE ACCIDENT REPORT
DIVISION FOR INVESTIGATION OF MARITIME ACCIDENTS**

**KNUD LAURITZEN
Accident to seafarer
4 February 2009**

Division for Investigation of Maritime Accidents. Danish Maritime Authority,
Vermundsgade 38 C, DK 2100 Copenhagen
Phone: +45 39 17 44 00, Fax: +45 39 17 44 16 CVR-nr.: 29 83 16 10
E-Mail: oke@dma.dk - www.sofartsstyrelsen.dk

The casualty report has been issued on 24 April 2009

Case: 200903010

The picture on the front page shows the chain block and the broken sling. (By courtesy of J. Lauritzen.)

The casualty report is available on our homepage: www.dma.dk.

The Division for Investigation of Maritime Accidents

The Division for Investigation of Maritime Accidents is responsible for investigating accidents and serious occupational accidents on Danish merchant and fishing vessels. The Division also investigates accidents at sea on foreign ships in Danish waters.

Purpose

The purpose of the investigation is to clarify the actual sequence of events leading to the accident. With this information in hand, others can take measures to prevent similar accidents in the future.

The aim of the investigations is not to establish legal or economic liability.

The Division's work is separated from other functions and activities of the Danish Maritime Authority.

Reporting obligation

When a Danish merchant or fishing vessel has been involved in a serious accident at sea, the Division for Investigation of Maritime Accidents must be informed immediately.

Phone: +45 39 17 44 00
Fax: +45 39 17 44 16
E-mail: oke@dma.dk

Cell-phone: +45 2334 2301 (24 hours a day).

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1 Summary

ALL TIMES ARE IN LOCAL TIMES (GMT – 7)

Knud Lauritzen arrived at Port Hueneme in the morning on 1 February to load empty refrigerating containers on the hatch covers. In the afternoon on 3 February it was observed that the hoisting function on crane no 5 did not work.

After finishing loading the ship prepared for sea. To secure the jib on crane no 5 it was necessary to lower the jib. When lowering the jib the block and hook of the crane would land on the deck with possible damage to cylinders and hydraulic hoses operating the opening and closing of the hatches.

To prevent any possible damage an arrangement was made to secure block and hook in a position above the deck. After having fastened the block and hook, they were to be pulled forward and secured on the deck. During the process of carrying out this procedure a sling in the arrangement broke, and the block and hook fell to the deck injuring the chief officer.

The chief officer suffered severe injury. He was hospitalized and shortly after transferred to his home in Denmark for further treatment.

2 Conclusion

The causes that led to the accident to the seafarer were the following:

- Due to the defect on crane no 5 a situation in which the crew was inexperienced arose (7.1).
- The solution to secure crane no 5 was thus an operation not tested on prior occasions (7.2).
- The method for solving the problem concerning securing crane no 5 was not thoroughly analyzed for potential element of risks (7.3).
- There was sufficient slack on the runner after lowering the jib to its holder to enable the block and cargo hook to fall to the deck. (7.3).
- The injured person was forced to position himself in a potentially dangerous position due to the arrangement for landing the block and hook on deck. (7.2).
- A sling that was a part of the arrangement was cut in two pieces as it was led over a sharp edge (7.3).

3 Preventive measures

An extraordinary meeting in the Safety Committee was held on board on 8 February 2009 at 1015 hrs. The participants were the master, chief engineer and the bosun.

The accident was thoroughly discussed. The conclusion of the Safety Committee was that one of the slings used in the arrangement was cut in two pieces on the sharp edge inside the corner fastening point of the container causing the block and hook to fall on the deck.

To avoid accidents like this in the future, all fastening in container corners or similar positions must be done using shackles, wires or chains and in a position direct at the point of making fast. It must be avoided that ropes, slings and wires are passing over edges or around corners where chafing is possible.

Furthermore it was recommended always to avoid going neither near nor standing below hanging items.

4 Recommendations

To the shipping company

The shipping Company is urged to promote a general discussion about safety management on board their ships not only focusing on procedures to make standard operations safe, but also enhancing Safety Culture on board in order to make crewmembers think pro-actively and identify hazards before they turn into an actual risk.

5 The investigation

The Investigation Division has interviewed the chief officer and received statement of facts from the master of the ship and statement from the chief engineer as well as the minutes from a meeting held in the Safety Committee on 8 February 2009.

6 Factual Information

6.1 Accident data

Type of accident (the incident in details)	Accident to seafarer
Time and date of the accident	4 February 2009 at 0155
Position of the accident	Port Hueneme
Area of accident	Foreign port
Injured person	The chief officer
IMO Casualty Class	Very Serious

6.2 Navigation Data

Stage of navigation	In harbour
Port of arrival	Port Hueneme
Date and time of arrival	1 February 2009 at 0600
Date and time of expected departure	4 February 2009 at 0300

6.3 Ship data

Name	Knud Lauritzen
Home port	Frederikshavn
Call sign	OOUF2
IMO No	8903167
Flag State	Denmark
Construction year	1990
Type of ship	Refrigerated Cargo Ship
Tonnage	14,406 BT
Classification Society	Bureau Veritas

Length	165.00 m
Engine power	12,400 kW
Hull construction	Steel – Double bottom



6.4 Weather data

Wind – direction and speed	Direction not known – Light breeze
Sea	No sea
Visibility	Good visibility
Light/dark	Dark

6.5 The Crew

Number of crewmembers	17
Number of crewmembers certified to act as bridge watch	4
Watch on the bridge	3 shift
Deck watch in port	2-shift
Occupation on board the ship at the time of the accident (crewmembers relevant to the accident)	Age, Certificate of Competency, other certificates, training, sailing time.
Chief officer	Age 32 years. Holder of Certificate of Competency as Mate, 1 st Class, STCW II/2. He has been going to sea since 1995. He has experience as watch keeping officer since 2004 and as chief officer since 18 November 2008 where he signed on Knud Lauritzen.

6.6 Narratives

Knud Lauritzen is a Refrigerated Cargo Ship in regular service between Port Hueneme, California, and Ecuador. On the 1 February 2009 the ship arrived at Port Hueneme to load empty refrigerating containers on the hatch covers. The holds were empty. After finishing loading the ship was to depart shortly after midnight on 4 February 2009.

6.7 The Crew / Harbour watch

The total number of crew was 17. Amongst the crew was three navigation officers, one general purpose rating, three able bodied seamen and an apprentice. At sea the three navigation officers work a 3-shift watch. In port the watch on deck is shared between the 2nd officer and the 1st officer. The shift turns every 6 hours. There is also a ships assistant on deck watch. While in port the chief officer generally supervises the loading and discharging operations as well as calculating the stability and taking care of ballasting. He is also responsible for the contact to stevedores. The normal working hours for the chief officer is between 0600 and 1700. Furthermore he is on call outside his normal working hours.

On 3 February the chief officer began his work at 0600 and went off duty at 1800. After having had his dinner he went to sleep until 0100.

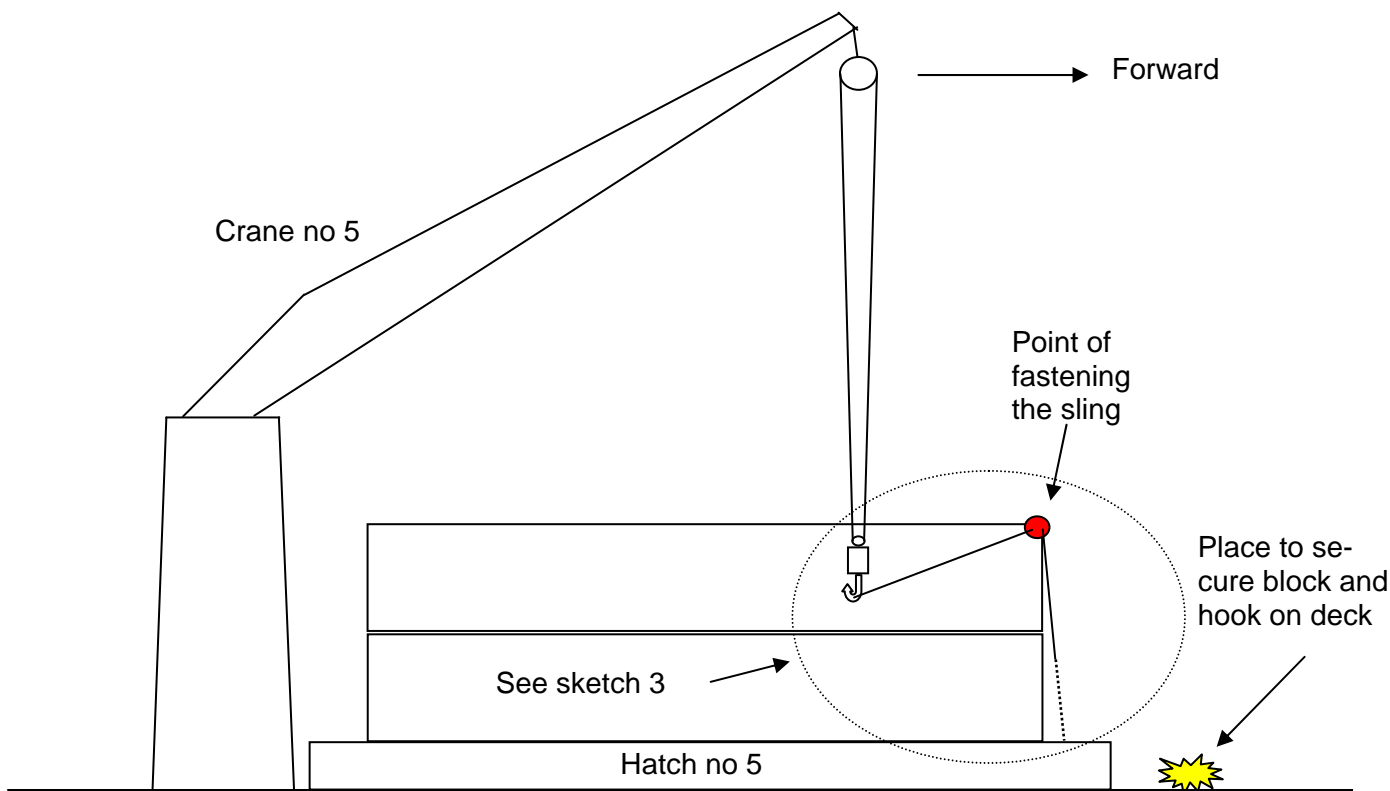
6.8 The malfunction of the crane no 5

In the afternoon on 3 February while loading empty refrigerating container it was observed, that the hoisting function on crane no 5 did not work. If the handle to operate hoisting and lowering was placed away from "neutral" the crane block and hook was lowered by the weight of the block and hook alone. In total the weight of block and hook is 460 kg. The ships engineers started fault detection on the crane, and after an hour it was found that the fault either was in the hoisting motor or in the hoisting gear. The malfunction could not be repaired here and now, so the jib was swung to port in order to let the other cranes finish the loading of containers.

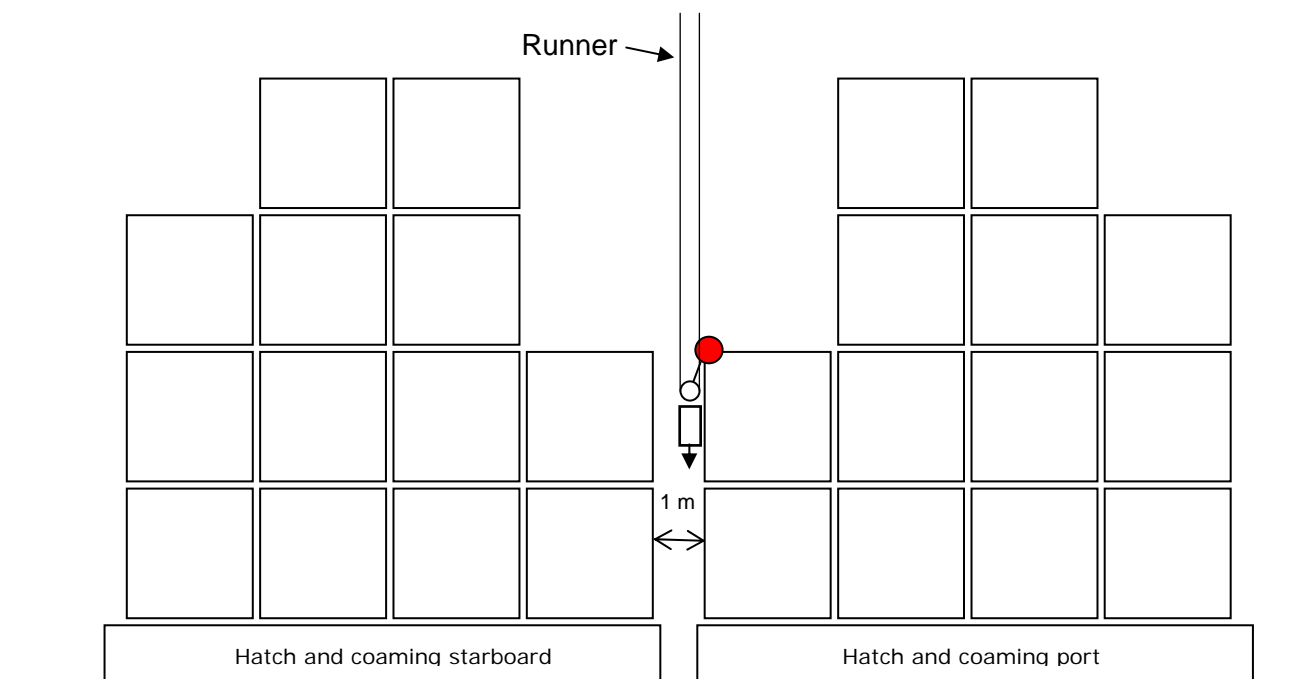
6.9 The arrangement to secure crane no 5 for sea

In order to secure the cranes for sea the block and hook was hoisted to just beneath the jib which are then lowered to a horizontal level and secured in a holder. The hook is then by help of a strap fastened to the foundation of the crane in front and the runner is tightened.

After crane no 5 stopped to work properly, the block and hook was hanging approximately 20 metre below the jib end. To avoid the block and hook from damaging hydraulic cylinders and hoses when landing on the deck between the hatches due to lowering the jib it was planned to fasten the block and hook on the side of the inner row of the containers on the port hatch no 5. The upper container of this row was in tier 2. The block and hook should then be hanging in a suitable distance above the deck enabling the block and hook to be pulled forward to be secured on the deck in front of hatch no 5. This arrangement was discussed between the master, chief engineer and chief officer.



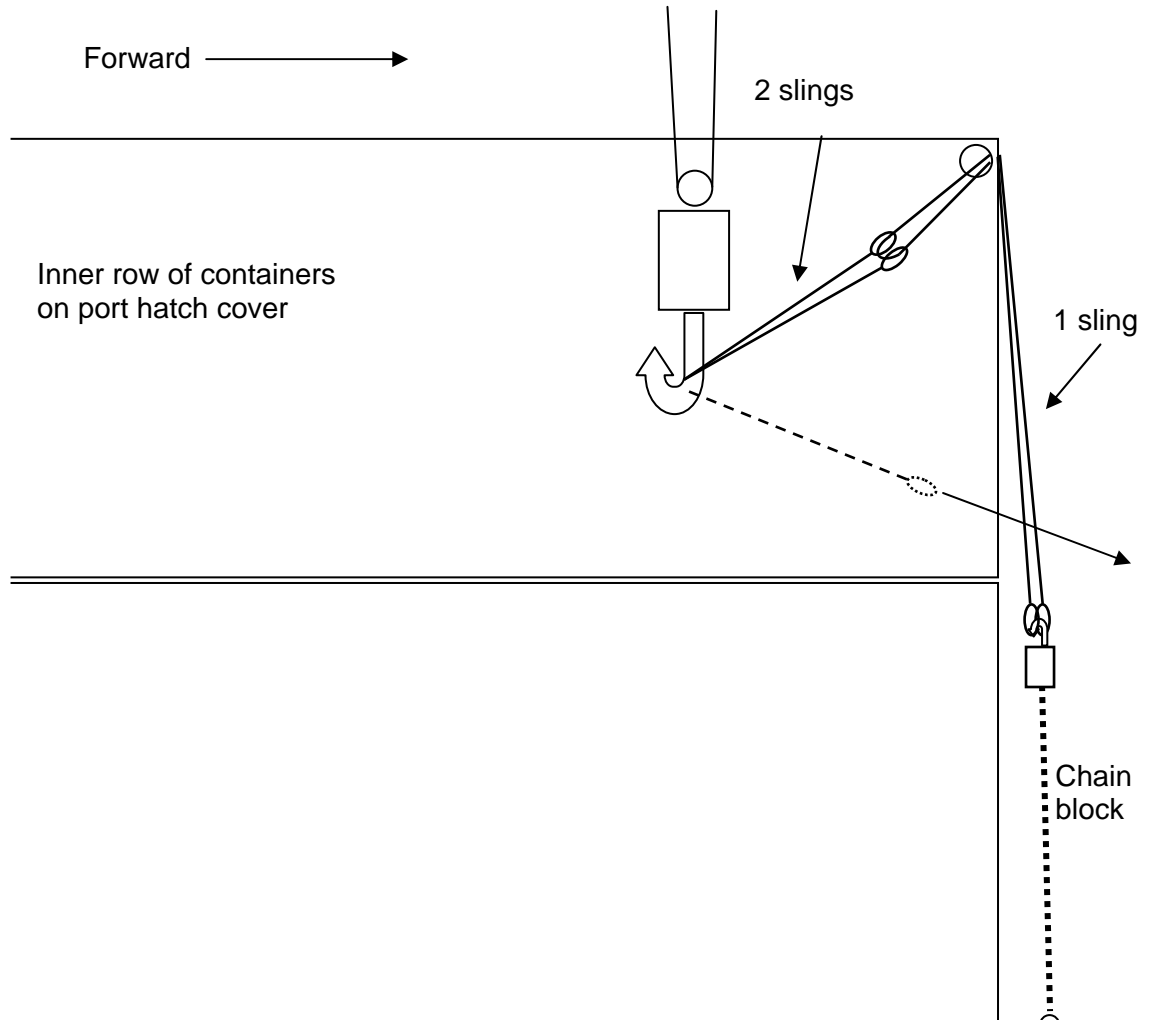
Sketch 1 showing crane no 5 and the inner rows of containers on port hatch no 5.



Sketch 2 showing the bay of containers on hatches no 5 seen towards aft

It was agreed to fasten two slings on the cargo hook. A chain block was fastened in the hatch cover just in front of the containers. The chain block was to be used to tighten the slings when lowering the jib. To connect the two slings on the hook with the chain

block, a third sling was used. One of the eyes of this sling was to be placed on the chain block, and then the other eye was to be taken through the container corner used for fastening containers on top. After been taking through the eyes of the two slings on the cargo hook it was finally taken back through the same container corner and placed on the chain block. The plan was to hang the block and hook in the slings when lowering the jib.



Sketch 3 showing the arrangement

There were considerations about the strength of this arrangement. The slings used had a SWL of 1,000 kg and a safety factor of 8. The chain block had a SWL of 1,000 kg. It was considered that this was more than sufficient to handle the total weight of the block and hook which were 460 kg.

After the accident, the broken sling was sent to an impartial company with regards to the tolerance values of the sling. No qualified reply was received in a reasonable time.

6.10 The accident

On 4 February at 0142 the loading finished and the crew started securing for sea. The chief officer was called at 0100 to personally attend the rigging of the arrangement of securing crane no 5. He felt fresh and rested. It was dark but the deck was well illuminated by deck light. During the work on deck the chief officer was wearing helmet, safety shoes, gloves and boiler suit.

To lower the jib, the chief engineer entered the crane cabinet and the chief officer positioned himself in front of the containers on hatch no 5. The contact between the chief engineer and the chief officer was by VHF.

The jib was lowered until the crane hook and block was hanging in the slings and chain block. When the chief officer observed, that there was a slack on the runner he ordered the chief engineer by VHF to stop lowering the jib. During the lowering of the jib the chief officer was standing in front of the containers.

The block and crane hook was now hanging in the slings in a height of approximately 1½ to 2 metres above the deck. The chief officers now moved into the narrow gap between the two rows of containers to fasten the sling to be used to pull the block and cargo hook forward when lowering the jib to its holder. The gap between the containers was approximately 1 metre. After approximately one minute the chief engineer heard a bang and then the chief officer crying for help on the VHF. Prior to the accident the chief officers had heard nothing unusual.



The broken sling

J. Lauritzen



Site of the accident

J. Lauritzen

The chief engineer immediately rushed to the site of the accident and found the chief officer deadlocked between the deck and the starboard containers. The cargo hook and block was lying on top of the chief officers' right leg.

The chief engineer called for help on the VHF, but as he received no response, he ran to the ship's office where he found the master. Immediately the master hurried to the site of the accident.

He ordered the chief engineer to hurry to the crane cabinet and hoist the jib in order to disengage the chief officer. The chief engineer hoisted the jib and simultaneously moved it slightly towards port to make the block and hook move upwards alongside the port containers.

The master examined the chief officer and found that he was not heavily bleeding. But as the right arm and right leg was total out of position the master decided not to move the chief officer until help from ashore arrived.

Via the ship's agent an ambulance was called and at 0210 it arrived. At 0240 the ambulance left taking the chief officer to hospital.

6.11 Consequences

The doctor who arrived with the ambulance informed the master, that the chief officer had broken his right thigh bone, his right underarm and had suffered damage to his right hand.

A succeeding medical assessment of the chief officer indicates that he probably will not suffer permanent damage due to the accident.

7 Analysis

7.1 Crane no 5.

Before finishing loading crane no 5 had a malfunction as it was unable to hoist. This occurred approximately 8 hours before planned departure. The engineers began fault detection and it was found, that the fault was either in the hoisting motor or in the hoisting gear. It was apparently not possible to repair the crane before departure.

As this situation never had happened before or similar situations had been experienced by any of the crew it called for a new, untested and uncommon procedure for securing the crane before departure.

The Division for Investigation of Maritime Accident notices that the malfunction of crane no 5 was a contributing factor to the accident.

7.2 The arrangement to secure crane no 5.

Due to potential damage to hydraulic equipment operating the hatch covers it was decided to avoid lowering the block and crane hook unto the deck between the two inner rows of containers on hatch no 5. To solve this problem it was decided to hang the block and cargo hook in slings above the deck in order to be able to pull the block and hook forward to secure it on the deck in front of hold no 5.

Consideration was given to the strength of the planned arrangement and provisions were made to ensure that the elements in the arrangement possessed sufficient Safe Working Load.

The arrangement called for the chief officer to get very close to the block and hook hanging in the narrow gap between two rows of containers. In the narrow gap there was an imminent danger of getting deadlocked between the containers and the block and hook.

The Division for Investigation of Maritime Accident notices, that a new, untested and uncommon procedure led to elements of potential danger.



The sling passing over sharp edges J. Lauritzen

7.3 Risk assessment

The arrangement did not undergo a thorough analysis regarding potentially elements of risk besides the strength of the slings and chain block.

Thus it was not recognized, that the poly propylene sling was resting on a sharp edge in the container corner used for lifting the container and thus in danger of chafing.

Neither it was not recognized that too much slack on the runner would result in the block and hook falling down to the deck in case of the slings or the chain block used in the arrangement should break.

The Division for Investigation of Maritime Accident notices, that the arrangement did not undergo a thorough risk assessment.