FEBIMA

Vooruitgangstraat 56

B - 1210 Brussels

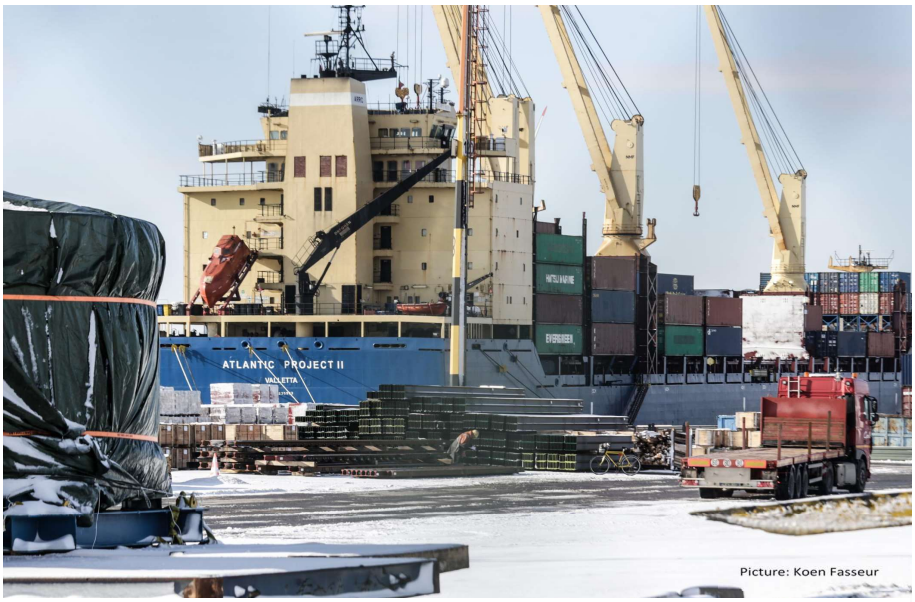
Belgium

Report 2021/000704

Report on the investigation

into a fatal accident

on board **mv ATLANTIC PROJECT II**



in the port of Antwerp

with the decease of one crew member

on February 8th 2021.

Federal Bureau for the Investigation of Maritime Accidents

Extract from European Directive 2009/18

(26) Since the aim of the technical safety investigation is the prevention of marine casualties and incidents, the conclusions and the safety recommendations should in no circumstances determine liability or apportion blame.

In view of the COVID-19 pandemic in 2020, and local rules and regulations to prevent the further spread of the virus, the investigators of the Federal Bureau for the Investigation of Maritime Accidents adhered to all legislation in vigour, which might have hampered certain investigative acts. Nevertheless, no efforts were spared to conduct the investigation, into the cause of the marine accident mentioned in this report, to the largest possible extent and conclusions were only drawn after very large consideration.

This page is intentionally left blank.

1 CONTENT

1 Content 3

2 List of illustrations 4

3 Glossary of abbreviations and acronyms 4

4 Marine Casualty Information 5

4.1 Resume 5

4.2 Classification of accident 6

4.3 Accident Details 6

5 Synopsys 7

5.1 Narrative 7

6 Factual information 18

6.1 Vessel's particulars 18

6.2 Tween-deck pontoon covers 19

7 Analysis 21

7.1 Incident Timeline 21

7.2 Barrier Failure Analyses Diagram (BFA) 24

7.3 Incident Tree Cut-up 25

8 Cause of the accident 33

9 Safety Issues 34

9.1 Safety Issue 1 34

9.3 Safety Issue 2 35

9.4 Safety Issue 3 37

10 Actions taken 38

2 LIST OF ILLUSTRATIONS

Figure 1 - Cargo below the tween-deck pontoons in cargo hold 3 PS..... 7
Figure 2 - Deck crane used for shifting pontoons..... 9
Figure 3 - Location of AB and OS.....10
Figure 4 - Pontoon N°5 lifted 11
Figure 5 - Manhole between PS and SB cargo hold.....12
Figure 6 - Detail of manhole.....12
Figure 7 – Lifted pontoon in the cargo hold 14
Figure 8 - Side lights inside the cargo hold space.....15
Figure 9 - View from the crane cabin 15
Figure 10 - Overview of the scene.....16
Figure 11 – Mv ATLANTIC PROJECT II 18
Figure 12 – Numbering of pontoons 19
Figure 13 - Open door in aft bulkhead 34
Figure 14 - Observation post on the weather deck 36
Figure 15 - View from the observation post in the cargo hold 36

3 GLOSSARY OF ABBREVIATIONS AND ACRONYMS

AB	Able Bodied Seaman
BFA	Barrier Failure Analysis
cbm	Cubic Metres
IMO	International Maritime Organization
kW	kiloWatt
Lbpp	Length Between Perpendiculars
LOA	Length Over All
LT	Local Time
m	Metre
mT	Metric Tons
N°	Number
OS	Ordinary Seaman
PS	Portside
SB	Starboard
SMS	Safety Management System
TEU	Twenty Foot Equivalent Unit
UTC	Universal Time Coordinated
v.	Version

4 MARINE CASUALTY INFORMATION

4.1 RESUME

Throughout this report all times are in Central European Wintertime which is UTC+1, unless specified.

On February 8th, 2021, mv ATLANTIC PROJECT II was moored at the Port of Antwerp. Stevedores were unloading the vessel.
When tween-deck cargo hold N°3 on PS was empty, the tween-deck pontoons had to be removed by the ship's crew, using ship's gear, to allow access to the cargo stowed below.
After the first pontoon was hoisted and moved using the ship's crane to its stacking position at the aft part of the cargo hold, a crew member was hit by the lifted pontoon.
The injured crew member did not survive the impact.

4.2 CLASSIFICATION OF ACCIDENT

According to Resolution A.849(20) of the IMO Assembly of November 27th, 1997, Code for the investigation of Marine Casualties and Incidents, a very serious marine casualty means a marine casualty involving the total loss of the ship or a death or severe damage to the environment, consequentially, the incident was classified as

VERY SERIOUS

4.3 ACCIDENT DETAILS

Time and date	February 8th, 2021, 07:55 hours LT
Location	Berth 468, Port of Antwerp, Belgium
Persons on board	21
Deceased persons	1

5 SYNOPSYS

5.1 NARRATIVE

On February 7th, 2021, the general cargo vessel mv ATLANTIC PROJECT II was on her way from Bilbao to Antwerp. The Captain and the Chief Officer held a pre-arrival meeting to discuss the planned cargo operations when moored at the port.
The vessel was scheduled to stay approximately one day in port. Some cargo operations were planned during that day and fuel had to be bunkered and provisions had to be taken in.

A part of the cargo to be unloaded was in cargo hold N°3, on top as well as below the tween-deck as seen in Figure 1.

The pre-arrival meeting had considered that the ship's crew had to remove the tween-deck pontoons of hold N°3 by using the ship's crane, as soon as the stevedores finished unloading the cargo on top of the tween-deck.

Figure 1 - Cargo below the tween-deck pontoons in cargo hold 3 PS

On February 7th, at 13:30 hours, the mv ATLANTIC PROJECT II was safely moored SB side alongside at berth 468 in the port of Antwerp.

At 14:00 hours, the same day, the bunker barge arrived alongside and subsequently fuel was bunkered. The bunker barge departed at 16:00 hours.

The planned cargo operations on February 7th had to be cancelled due to snowy weather and were rescheduled for the next day.

On February 8th, at 06:00 hours, the stevedores arrived and commenced unloading cargo hold N°3 PS, as scheduled.

The weather at that time was cloudy and it was still dark outside. Civil twilight[1] was calculated for 07:34 hours and sunrise for 08:09 hours.

Around 07:00 hours, the chief officer assigned four crew members to remove the tween-deck pontoons once the cargo in hold N°3 PS on top of the tween-deck was unloaded.
All four crew members were properly trained for the job and were involved in tween-deck pontoon operations before.

A job hazard analysis titled “Shifting of pontoon covers” and a risk assessment titled “Operation of lifting equipment” were performed by the chief officer and approved by the captain.

At 07:45 hours, the stevedores finished unloading the cargo stowed onto tween-deck N°3 PS and they moved on to cargo hold N°3 SB.

The tween-deck pontoon covers of hold N°3 PS could subsequently be removed.

At 07:45 hours, the bosun held a meeting with the other crew members assigned to the job and distributed the tasks.

The bosun was assigned to operate the crane. The deck crane shown in Figure 2, was used for this job. The crane lights were ignited, but the top light was not working.

[1] In the morning, civil twilight begins when the sun is 6 degrees below the horizon and ends at sunrise. On a clear day, there is sufficient light during civil twilight to perform most outdoor activities.

Figure 2 - Deck crane used for shifting pontoons.

One able bodied seaman, or AB, was assigned as signal man and was equipped with a portable two-way radio to communicate with the crane operator. He was the only person in the cargo hold provided with a portable two-way radio.
Same AB was also engaged in rigging the tween-deck pontoons in the cargo hold.

One ordinary seaman, OS, was assigned to assist the AB.

The AB and the OS were positioned in the forward part of the cargo hold, where they would rig the pontoons, as indicated in Figure 3.

Figure 3 - Location of AB and OS

A second OS was assigned to unrig the pontoons once they were laid down on top of other tween-deck pontoons in the aft of the cargo hold, against the bulkhead, as indicated in Figure 4.

Figure 4 - Pontoon N°5 lifted

Pontoon N°5 had to be put against the bulkhead in the aft of the cargo hold, as indicated by the green arrow.

This OS had to be stand-by in a safe position until the first pontoon was laid down on deck. The dedicated safe position for a crewmember during the manoeuvring of the pontoons inside the hold was inside or behind a manhole between PS and SB cargo hold, as shown in Figure 5 and Figure 6.

The manhole was the dedicated passage from PS hold to SB hold.

Figure 5 - Manhole between PS and SB cargo hold

Figure 6 - Detail of manhole

At 07:48 hours, the crew members started shifting the pontoons.

At that moment, the officer of the watch was at the gangway to welcome a class register inspector. The chief officer and the captain were inside the accommodation.

Pontoon N° 5 was the first pontoon that was to be moved.

After the pontoon was rigged by the OS and the signal man, they kept at a safe distance from the pontoon, in the forward part of the cargo hold.

From this safe position, the signal man gave hoisting orders to the crane operator through his portable two-way radio by using the command “vira”.
After having heard this command, the crane operator knew that all was clear and that everybody was out of harm’s way.

A hand signal indicating to hoist the hook was also given.

By hoisting the crane hook, the slings came under tension. The signal man saw that the cover was well slung and that the OS was in a safe position inside the manhole at the aft of the cargo hold. The signal man signalled the crane operator to hoist and move the pontoon by means of hand signals and the verbal command “vira” through his two way portable radio.

Once lifted, the pontoon was prone to becoming stuck between the bulkheads of the cargo hold if it turned. That being the case, the crane operator had to stop the lifting immediately.
The signal man and the OS each went to one side of the cargo hold to observe the bulkhead and the edges of the pontoon.
The side of the cargo hold shown in Figure 7 was observed by the signal man. The manhole was on the same side but was located behind the pontoon in this picture.

Figure 7 – Lifted pontoon in the cargo hold

The crane operator first lifted the pontoon approximately 1,5 m by only hoisting the crane hook. He used the side lights in the cargo hold as an indicator to hoist the pontoon approximately 1,5 m above deck.
To move the pontoon towards the aft part of the cargo hold, the boom of the crane was raised whilst the hook was lowered.

By doing so, the pontoon was kept more or less stable at the same height whilst moving to the aft.

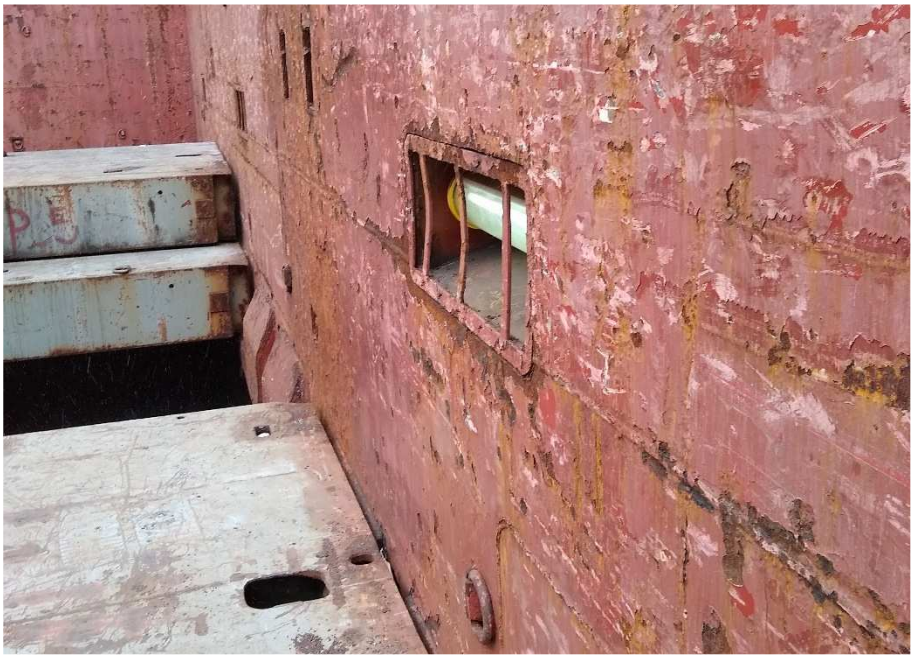


Figure 8 - Side lights inside the cargo hold space

The crane operator could not oversee the complete aft part of the cargo hold from his location in the crane cabin, as seen in Figure 9.

Figure 9 - View from the crane cabin

The lifted pontoon did not make any uncontrolled movement. The pontoon was not swinging or turning.

Reportedly, nothing unusual was heard or seen until the signal man saw that the OS who was in the aft of the cargo hold space was fallen on deck, in front of the door in the aft bulkhead, as indicated in Figure 10.

Figure 10 - Overview of the scene

1: The manhole, the safe location where the OS in the aft was last seen by the signal man
2: The door in the aft bulkhead where the OS was hit by the pontoon cover
3: Location of the signal man, observing the bulkhead and the edge of the pontoon
4: Location of the OS that assisted the signal man, observing the bulkhead and the edge of the pontoon
5: The crane operator was in the crane cabin
6: The pontoon that was lifted approximately 1,5 m above deck

The signal man shouted through the portable two-way radio to stop the operation and informed the crane operator.

At 07:55 hours, the captain, at that time inside the accommodation, also had a portable two-way radio and heard the call of the signal man.

The crane operator hoisted the crane hook and positioned the pontoon onto the deck, away from the victim.

Two of the ship's officers grabbed the first aid kit and proceeded to the victim.

At 07:59 hours the vessel's agent was called and asked to urgently send medical assistance to the ship. Meanwhile, the crew was giving first aid to the victim, but no sign of life was detected.

The captain reported to the agent that the victim was not giving any reaction anymore.

At 08:07 hours, medical assistance, including a doctor, arrived.

At 08:45 hours, the doctor confirmed that the victim had deceased due to his injuries.

6 FACTUAL INFORMATION

6.1 VESSEL'S PARTICULARS

Figure 11 – Mv ATLANTIC PROJECT II

Type	General cargo
Flag	Malta
Port of registry	Valletta
Call Sign	9HA3795
IMO N°	9235983
Shipyard	Xiamen shipyard, China
Year Built	2001
Owner	Atlantic project II limited
LOA	192,90 m
LBPP	182,00 m
Breadth	27,80 m
Deadweight	30312 mT, summer draught
Gross tonnage	23132
Net tonnage	9375
Main Engine	MAN B&W 7S60MC-C
Continuous service output	14206,5 kW
Capacity containers	1829 TEU
Capacity grain	34600 cbm

6.2 TWEEN-DECK PONTOON COVERS

Tween-deck pontoon covers were used to divide the depth of a cargo hold into two fixed parts. This allowed for the creation of extra cargo capacity for general cargo that could not be stacked on top of each other.

The tween-deck pontoon covers could also be removed from the cargo hold, if for example the whole cargo hold needed to be filled with grain, in which case the pontoons were to be stacked in a rack on the weather deck.

The tween-deck pontoon covers on board mv ATLANTIC PROJECT II were of Mac Gregor design.

In cargo hold N° 3 PS, eight pontoons of approximately 10,2 m long, 3,2 m wide and 0.64 m high, formed a tween-deck covering the entire cargo hold.
The weight of one such pontoon was 8 tons.

The pontoons were not interchangeable. Each pontoon corresponded with a dedicated position, but the design of the pontoons was such that it was possible to lift them in non-sequential order.

According to the instructions of Mac Gregor, the pontoons could be stacked over all adjacent panels.
Instructions by Mac Gregor to stack the pontoons eight pieces high in the aft of the cargo hold were also described.

In Figure 12, pontoon N°5 is seen to be lifted and placed on top of pontoons N°6 and N°7.

Figure 12 – Numbering of pontoons

Originally, the pontoons were designed with pads at the edges to prevent paint to be scratched off the bulkheads during lifting.
The design of the pads was not practical for frequent use, and they became obsolete very fast after the commissioning of the vessel.
The pads served as a protection of the edges of the pontoon, and they did not prevent the covers from becoming stuck between the bulkheads of the cargo hold if it turned.

It was very common on board of mv ATLANTIC PROJECT II to shift the pontoon covers, whenever cargo needed to be loaded or unloaded below the tween-deck.
When a pontoon was shifted and stacked in the same cargo hold, by an experienced and trained crew, it only took approximately one minute to move and place a pontoon in the stacking position after it had been rigged.

7 ANALYSIS

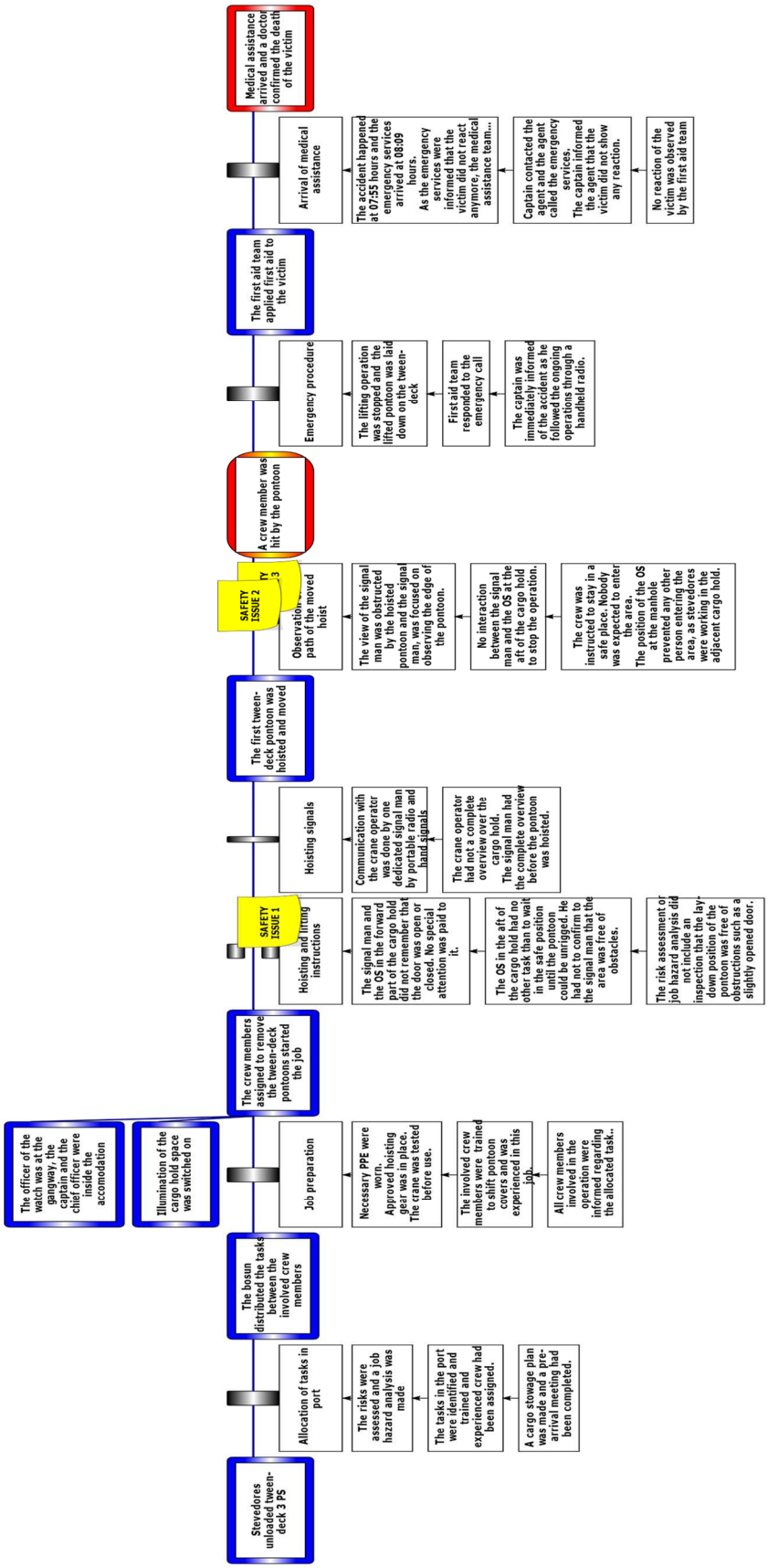
7.1 INCIDENT TIMELINE

Actor	Date and Time	Name
Third officer	25-aug-2020	Participant in training about crane operations including the shifting of tween deck pontoons.
Bosun	25-nov-2020	Trainer in training about crane operations including the shifting of tween deck pontoons.
Signal man	25-nov-2020	Participant in training about crane operations including the shifting of tween deck pontoons.
OS	25-nov-2020	Participant in training about crane operations including the shifting of tween deck pontoons.
Victim	25-nov-2020	Participant in training about crane operations including the shifting of tween deck pontoons.
Chief officer	25-nov-2020	Participant in training about crane operations including the shifting of tween deck pontoons.
Master	06-feb-2021	Master and Chief officer planned all tasks in the port of Antwerp.
Master	07-feb-2021	Vessel arrived in port at dedicated berth 466 and was moored at 13:30 hours.
Third party	07-feb-2021	Stevedores did not commence unloading due to bad weather.
Chief officer	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
Bosun	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
Signal man	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
Third officer	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
OS	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
Victim	07-feb-2021	All crew had a proper rest due to weather circumstances in the port.
Third party	8/02/2021 6:00:00	Stevedores arrived on board and commenced unloading cargo tween deck N°3 PS with shore crane.
Chief officer	8/02/2021 7:00:00	Chief officer assigned crew to stack tween-deck covers once stevedores finished unloading N°3 PS tween deck cargo.
Bosun	08-feb-2021	Bosun distributed the duties and the scheme for cover movements was agreed between the Bosun, both OS and the signal man
Signal man	08-feb-2021	Participated in the meeting before commencing the lifting job.
OS	08-feb-2021	Participated in the meeting before commencing the lifting job.
Victim	08-feb-2021	Participated in the meeting before commencing the lifting job.
Bosun	8/02/2021 7:45:00	Bosun to operate the crane to stack tween deck covers.
Signal man	8/02/2021 7:45:00	Inside cargo hold N°3 for securing the covers and communicating with Bosun

OS	8/02/2021 7:45:00	To assist signal man in cargo hold
Victim	8/02/2021 7:45:00	Stand-by in a safe place in the aft of the cargo hold, to unsecure the pontoons from the crane hook once stacked in place.
Third officer	8/02/2021 7:49:00	Third officer was at the gangway to meet the class register inspector.
Chief officer	8/02/2021 7:49:00	Chief officer was in the cargo office, busy with the cargo program.
Master	8/02/2021 7:49:00	Master was in the dining room finishing breakfast.
Victim	08-feb-2021	Was last seen in the safe place before the lifting of the pontoon.
Signal man	08-feb-2021	The signal man attached the slings to the crane hook.
OS	08-feb-2021	The OS assisted the signal man with the slings.
Signal man	08-feb-2021	When the slings were attached, the signal man commanded the Bosun by handheld to start lifting the pontoon, using the word "Vira", meaning that everybody is in a safe position and lifting can start.
Bosun	08-feb-2021	Bosun starts to operate the hook to put tension on the slings. The signal man again confirmed by the word "Vira" that lifting could continue.
Signal man	08-feb-2021	Signal man moved to forward right side of the cargo space to observe the position of the pontoon and the bulkhead of the vessel.
OS	08-feb-2021	OS moved to forward left side of the cargo space to observe the position of the pontoon and the bulkhead of the vessel.
Bosun	08-feb-2021	When the cover was lifted, above the tween deck, the bosun started booming up the crane to move the over to the back. Whilst booming up, he lowered the hook little by little to keep the panel approximately 1,5 metres above the tween-deck. The aft of the cargo hold was not visible for the crane operator.
Signal man	08-feb-2021	The signal man was on the right side of the cargo hold, watching the pontoon side and the bulkhead
OS	08-feb-2021	The OS was on the left side of the cargo hold, watching the cover side and the bulkhead.
Victim	08-feb-2021	The victim moved towards a door at the aft of the cargo space.
Victim	08-feb-2021	Nobody noticed the movement of the victim.
Master	08-feb-2021 07:55	Heard the signal man shouting in the radio to stop the crane.
OS	08-feb-2021 07:55	Saw that the victim was fallen on the deck.
Signal man	08-feb-2021 07:55	The signal man commanded the crane operator to stop after he saw the victim lying on the tween-deck.
Bosun	08-feb-2021 07:55	The crane operator laid down the pontoon, away from the place of the incident and switched off the crane.
Master	08-feb-2021 07:59	Called the agent to request an ambulance.
Third officer	08-feb-2021 07:59	The third officer and the second officer took a stretcher and a first aid kit and went to the cargo hold.

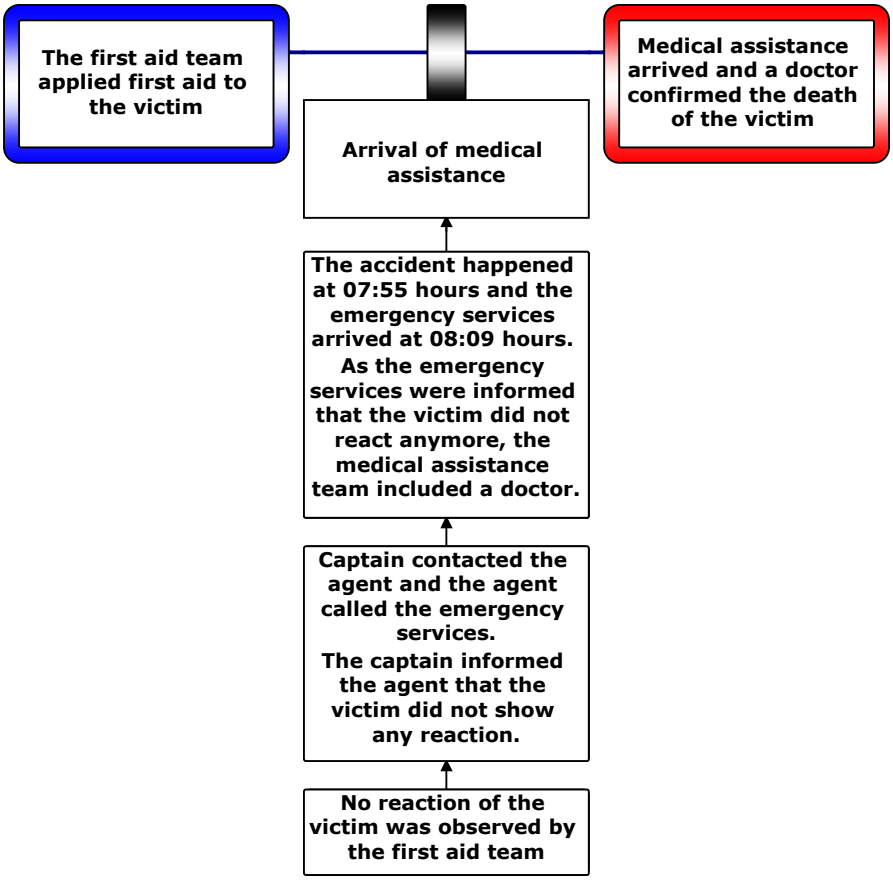
Master	08-feb-2021 07:59	Master informed the agent that the victim did not show any sign of life.
Third party	08-feb-2021 08:07	The ambulance arrived.
Third party	08-feb-2021 08:09	The police arrived.
Third party	08-feb-2021 08:45	A doctor confirmed that the victim passed away on the place of the accident as a result of his injuries.

7.2 BARRIER FAILURE ANALYSES DIAGRAM (BFA)



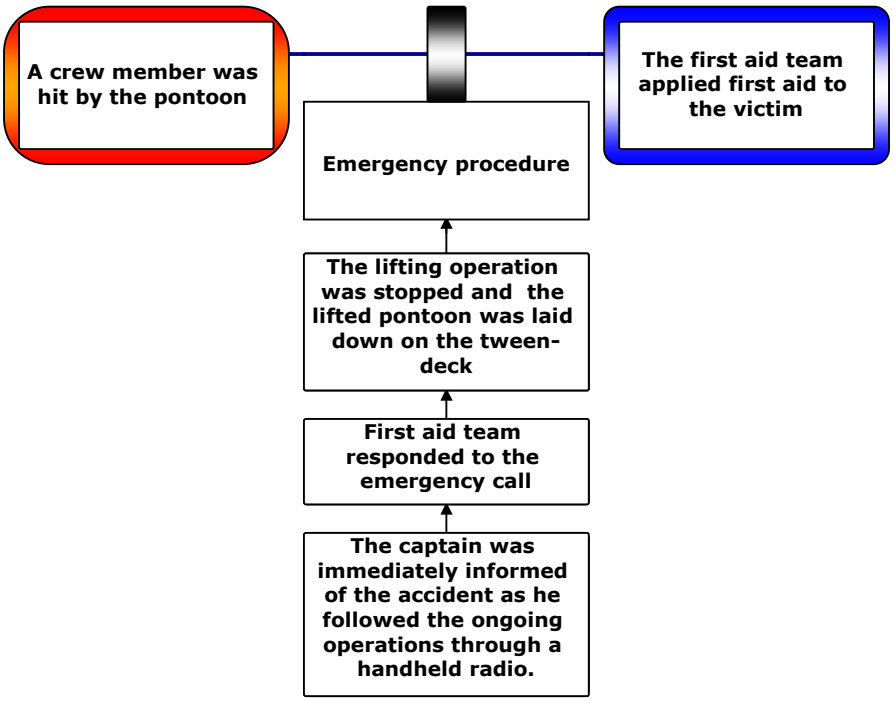
7.3 INCIDENT TREE CUT-UP

Incident Diagram: BFA Diagram



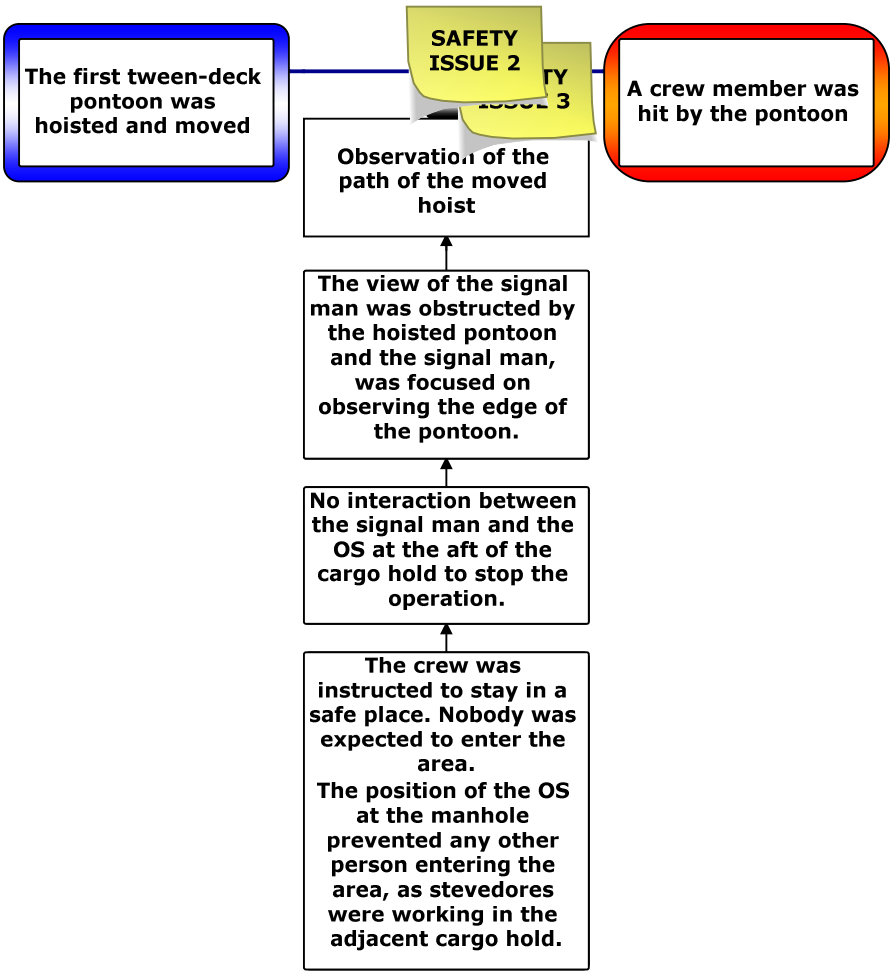
The ambulance arrived and a doctor confirmed the death of the victim

Incident Barrier	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
Effective Medical assistance called	BFA Primary Causes	Emergency response procedure	The accident happened at 07:55 hours and the emergency services arrived at 08:09 hours. As the emergency services were informed that the victim did not react anymore, the medical assistance team included a doctor.
	BFA Secondary Causes	Emergency notification contact list	Captain contacted the agent, and the agent called the emergency services. The captain informed the agent that the victim did not show any reaction.
	BFA Tertiary Causes	Medical assessment	No reaction of the victim was observed by the first aid team.



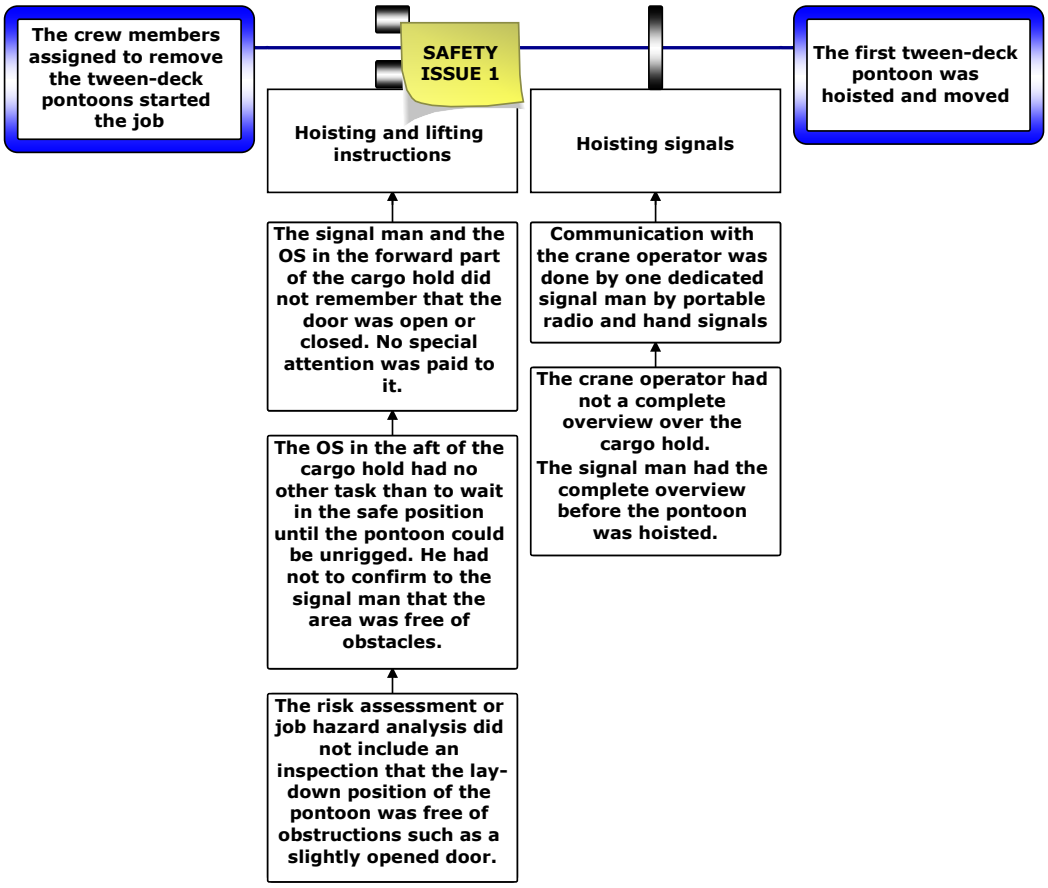
■ *The first aid team applied first aid to the victim*

Incident Barrier	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
Effective	BFA Primary Causes	Safe access	The lifting operation was stopped, and the lifted pontoon was laid down on the tween-deck.
Emergency procedure	BFA Secondary Causes	Emergency response plan	First aid team responded to the emergency call.
	BFA Tertiary Causes	Communication on board	Captain was immediately informed of the accident as he followed the ongoing operations through a handheld radio.



■ *A crew member was hit by the pontoon*

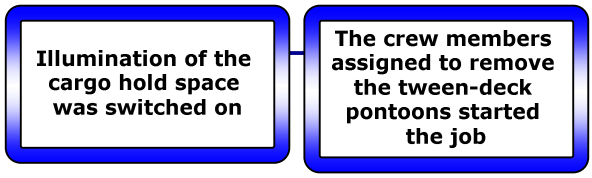
Incident Barrier **Failed** Observation of path of moving cargo	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
	BFA Primary Causes	Loss of overview	The view of the signal man was obstructed by the hoisted pontoon and the signal man, was focused on observing the edge of the pontoon.
	BFA Secondary Causes	Contingency planning	No interaction between the signal man and the OS at the aft of the cargo hold to stop the operation.
	BFA Tertiary Causes	Operational instructions	The crew was instructed to stay in a safe place. Nobody was expected to enter the area. The position of the OS at the manhole prevented any other person entering the area, as stevedores were working in the adjacent cargo hold.



- *The first tween-deck pontoon was hoisted and moved*

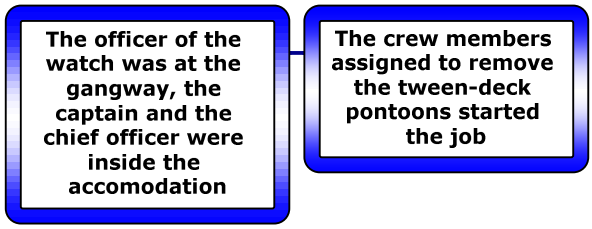
Incident Barrier	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
Effective	BFA Primary Causes	Inspection of lay-down area.	The signal man and the OS in the forward part of the cargo hold did not remember that the door was open or closed. No special attention was paid to it.
Hoisting operation	BFA Secondary Causes	Operational instructions	The OS in the aft of the cargo hold had no other task than to wait in the safe position until the pontoon could be unrigged.

Incident Barrier **Unreliable** Hoisting signals	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
	BFA Primary Causes	The code of safe working practices	Communication with the crane operator was done by one dedicated signal man by portable radio and hand signal.
	BFA Secondary Causes	Lifting equipment operations procedure	The crane operator had not a complete overview over the cargo hold The signal man had the complete overview before the pontoon was hoisted.



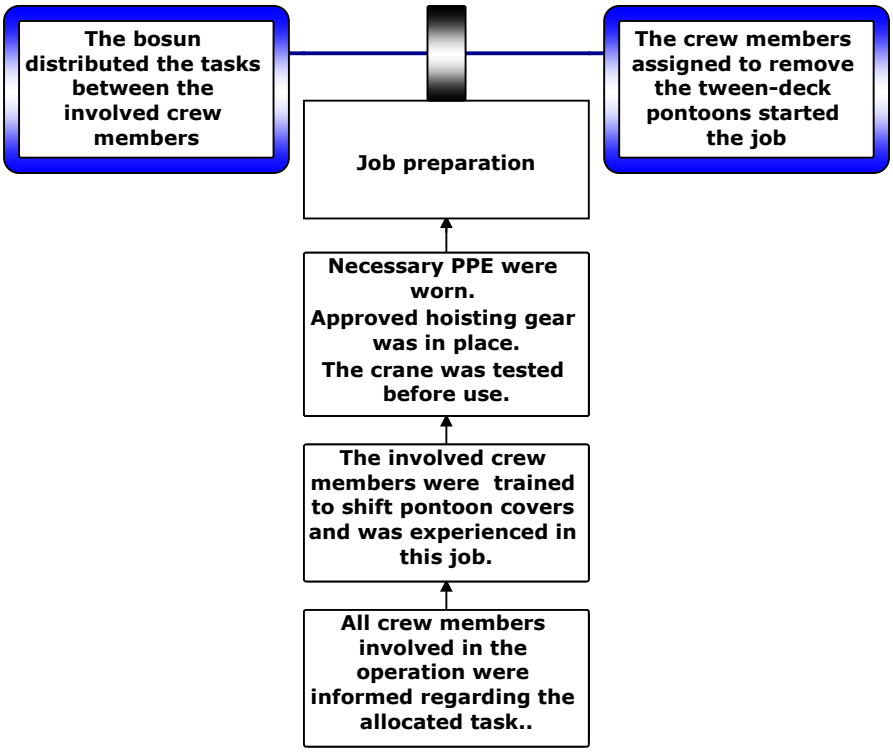
- *The crew members assigned to remove the tween-deck pontoons started the job*

The top light of the crane was not working.
It was civil twilight when the shifting of the pontoon covers commenced.
The signal man did see the OS in the aft of the cargo hold before commencing the hoisting operation and he did see the OS when he was fallen down on deck.



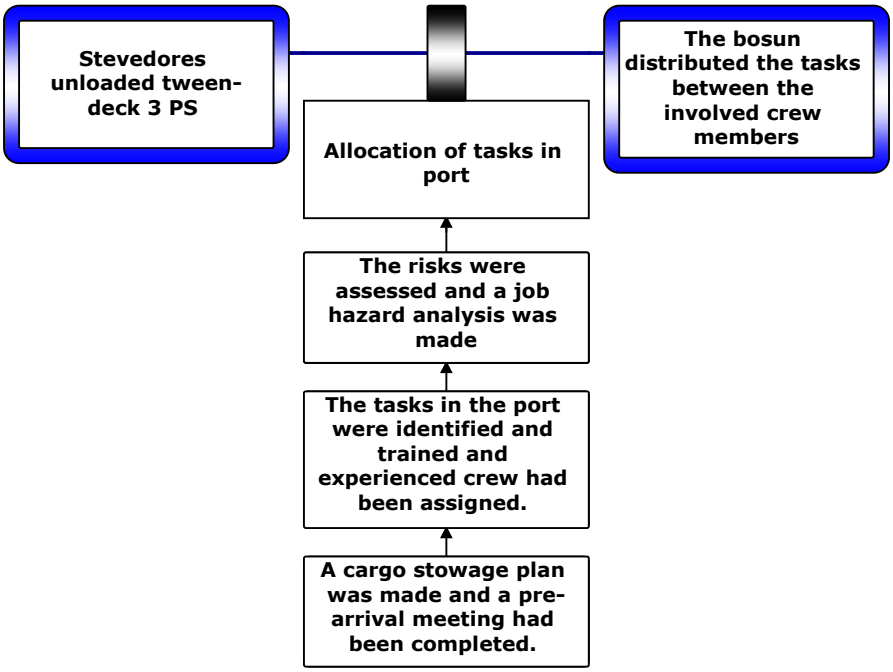
- *The crew members assigned to remove tween-deck pontoons started the job*

The duty officer was not involved in the shifting of the pontoon covers.



- *The crew members assigned to remove tween-deck pontoons started the job*

Incident Barrier	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
Effective	BFA Primary Causes	Safety management system	Necessary PPE were worn. Approved hoisting gear was in place. The crane was tested before use.
Job preparation	BFA Secondary Causes	Training records and employment contracts	The involved crew members were trained to shift pontoon covers and was experienced in this job.
	BFA Tertiary Causes	Toolbox meeting	All crew members involved in the operation were informed regarding the allocated task.



■ *The bosun distributed the tasks between the involved crew members*

Incident Barrier	*Performance*	*Barrier Challenge*	*Remarks regarding performance*
Effective	BFA Primary Causes	Risk assessment	The risks were assessed, and a job hazard analysis was made.
Allocation of tasks in port	BFA Secondary Causes	Resources on board	The tasks in the port were identified and trained and experienced crew had been appointed.
	BFA Tertiary Causes	Pre-arrival procedure	A cargo stowage plan was made, and a pre-arrival meeting had been completed.

8 CAUSE OF THE ACCIDENT

The accident happened because the overview over the path of the hoisted pontoon was lost from the moment the pontoon was lifted from its initial position.
Since there was no overview over the path of the hoisted pontoon, it was not observed that a crew member had entered the danger zone between the bulkhead and the hoisted pontoon.

A trained and informed crew member involved in the hoisting operation had moved into the zone where the lifting operation took place without previously having stopped the operation, a clear indication that the contingency plan was not fully implemented and thus contributing to the accident.

No control measures were in place to verify if the stacking position was free of obstructions, such as cargo debris, before commencing the hoisting operation
Absence of such control measures could have led to someone entering the danger zone to rapidly remove any obstructions.
Therefore, the absence of control measures therefore is to be considered as a contributing factor to the accident.

9 SAFETY ISSUES

9.1 SAFETY ISSUE 1

The location to lay down the last had not been verified.

It could not be confirmed that the door in the aft bulkhead was properly closed. An open door could be damaged by the pontoon when it was laid down against the bulkhead.

As indicated in Figure 13, a wide-open door was visible from the other side of the cargo hold. The difference between a slightly opened door or a closed door could not be observed from this distance.

When the pontoon had to be laid down against the bulkhead, even a slightly opened door could be damaged by the pontoon.

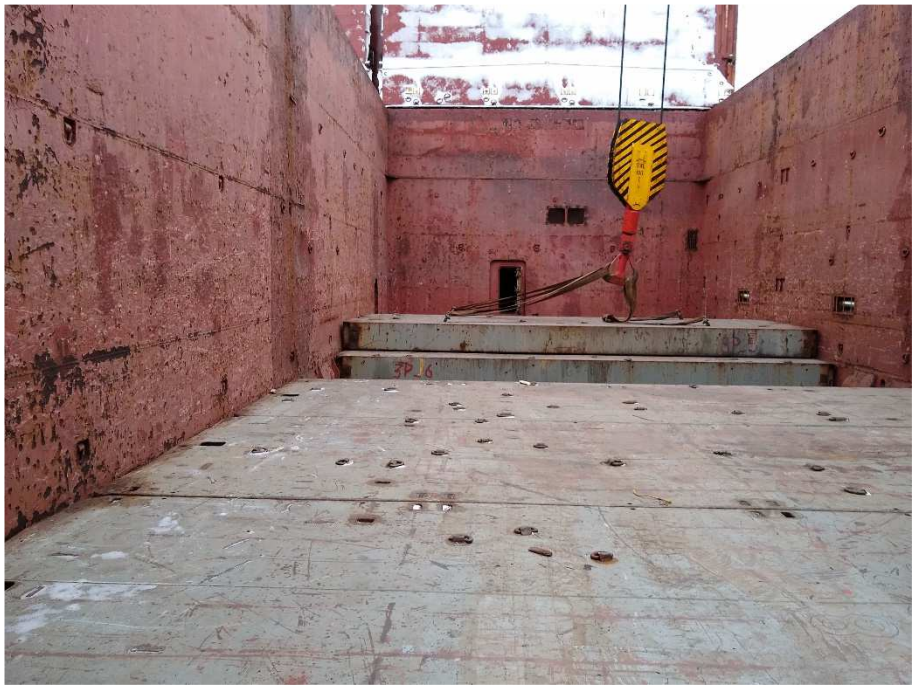


Figure 13 - Open door in aft bulkhead

9.3 SAFETY ISSUE 2

The vessel's safety management system, SMS, contained instructions regarding lifting equipment operations:

Personnel operating lifting equipment shall have no other duties at the time of operation and must have a clear view of the operation. Where this is not possible a trained signal man is to be used to give directional instructions to the operator. The signals used are to comply with these detailed in the Code of safe Working Practices.

The Code of Safe Working Practices for Merchant Seafarers, Amendment 5, Oct 2020, version 2, chapter 19.9.11.5 stated that:

The signal man should have a clear view of the path of travel of the load where the operator of the lifting equipment cannot see it.

The view of the signal man was obstructed by the lifted pontoon, as indicated in

Figure 7.

On the weather deck, observation posts were installed to observe cargo operations in the cargo hold, as shown in Figure 14.

From this observation post, a complete overview of the path of the hoisted pontoon could be kept, as shown in Figure 15.

Figure 14 - Observation post on the weather deck

Figure 15 - View from the observation post in the cargo hold

The blue circle indicates where the OS was hit by the pontoon.

9.4 SAFETY ISSUE 3

The contingency plan did not work

The job hazard analysis mentioned that a contingency plan should be considered. Appropriate assistance had to be requested and all occurrences had to be reported.

The OS located in the aft of the cargo hold did not report that he left his position. He did not stop the ongoing operation to create a safe environment before leaving his safe position. This indicated that the contingency plan, as mentioned in the job hazard analysis, did not work.

10 ACTIONS TAKEN

On February 18th, 2021, the company issued Fleet Marine Safety Circular N° 01/2021 with subject "*Improper lifting operation of crane results in fatality*".
The circular informed the fleet about the fatal accident and announced actions to be implemented.

Corrective actions:

- Corrective action 1:

All vessels must mark observation areas, or signal areas, on deck. The dedicated areas should be clearly marked and highlighted. Crew must be instructed about the use of signal man positions.

- Corrective action 2:

The company will issue new and explicit instructions for the organization of lifting operations and specific procedures for stacking pontoons in the hold.

- Corrective action 3:

All Masters must ensure that deck crew always wear a high visibility vest on top of jackets or coveralls.

- Corrective action 4:

All vessels must carry out a crew training for lifting operations with special attention to:

- Mandatory supervision of lifting operations by a Senior Officer; and
- The verification of the safe position of the team by the signal man before giving the instruction to lift.

- Corrective action 5:

The company will prepare a specific risks assessment for tween-deck pontoon stacking in the hold.

Preventive actions:

- Preventive action 1:

All deck personnel must obtain an official certificate for crane operator. Slingmen should be trained properly to set up the crane for specific loads and circumstances.

- Preventive action 2:

Awareness posters and instructions with graphic illustrations of manual handling techniques will be posted at important locations onboard.

- Preventive action 3:

The company will issue new risks assessment procedures, in correlation to the existing software tools that are installed onboard.

- Preventive action 4:

All Masters, Chief Officers and Chief Engineers must pass an internal examination for the practical implementation of risks assessments.

Federal Bureau for the Investigation of Maritime Accidents

Vooruitgangstraat 56 – B1210 Brussels – Belgium

Tel.: +32 2 277.43.43 – E-mail: secretariat@febima.fgov.be