



# SAFETY INVESTIGATION REPORT

202205/029

REPORT NO.: 08/2023

May 2023

The Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 prescribe that the sole objective of marine safety investigations carried out in accordance with the regulations, including analysis, conclusions, and recommendations, which either result from them or are part of the process thereof, shall be the prevention of future marine accidents and incidents through the ascertainment of causes, contributing factors and circumstances.

Moreover, it is not the purpose of marine safety investigations carried out in accordance with these regulations to apportion blame or determine civil and criminal liabilities.

### NOTE

This report is not written with litigation in mind and pursuant to Regulation 13(7) of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011, shall be inadmissible in any judicial proceedings whose purpose or one of whose purposes is to attribute or apportion liability or blame, unless, under prescribed conditions, a Court determines otherwise.

The report may therefore be misleading if used for purposes other than the promulgation of safety lessons.

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## **MV OPALINE** **Injury to a crew member,** **during cleaning of cargo spaces** **in the port of Rotterdam, the Netherlands** **26 May 2022**

### SUMMARY

In the afternoon of 26 May 2022, while the vessel was at Rotterdam, deck crew members were assigned various maintenance tasks around the vessel.

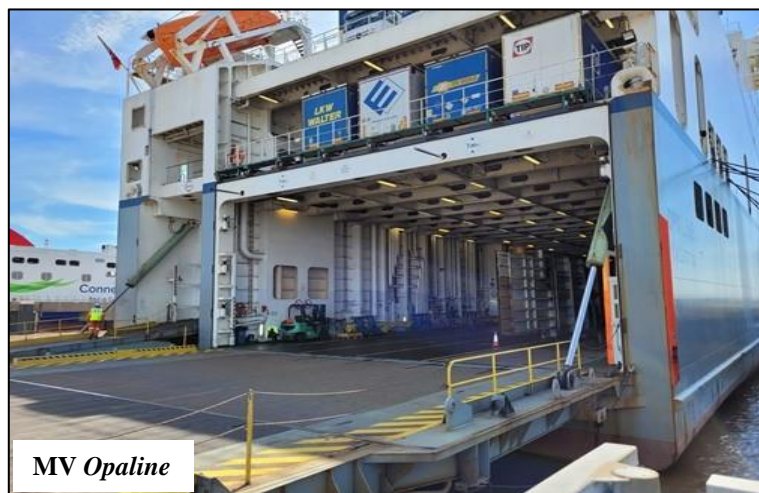
One crew member was cleaning the bulkhead near the stern ramp with pressurised water. He stood inside a basket, secured to the vessel's forklift truck, and raised to a height.

On completing the job, the crew member leaned over to one side to signal to the other crew

member on the deck but fell in the process.

The safety investigation concluded that the centre of gravity of the crew member shifted outboard, causing the basket to break the securing rope and topple over, resulting in the crew member's fall.

The MSIU has issued one recommendation to the flag State Administration to highlight the dangers of forklift truck operations.



MV Opaline

## FACTUAL INFORMATION

### The vessel

*Opaline* was a Maltese-registered roll-on roll-off (ro-ro) vessel of 33,960 gt. The vessel was built in 2010 by Flensburger Schiffbau Gesellschaft GmbH & Co KG, Germany, and owned by Shiplux III S.A. *Opaline* had been transferred to a new management company, Anglo-Eastern Ship Management (NL) B.V, Netherlands (Company) on 13 January 2022. Lloyd's Register of Shipping (LR) acted as the classification society, while Det Norske Veritas (DNV) was the recognized organization in terms of the International Safety Management Code, for the vessel.

The vessel had a length overall of 195.40 m, a moulded breadth of 30.00 m, and the moulded depth to upper deck was 18.15 m. A summer draft of 7.42 m, corresponded to a summer deadweight of 1,343 mt. A total of 3,895 m<sup>3</sup> of lanes, the arrangement of the cargo space in the vehicle decks, enabled the carriage of wheeled freight.

*Opaline* was powered by a 12-cylinder, four-stroke, single-acting, medium-speed, MaK12VM43C marine diesel engine, producing 10,800 kW at 500 rpm. This drove a single controllable pitch propeller, enabling the vessel to reach an estimated speed of 19 knots.

### *Opaline's* voyage schedules

*Opaline* had been taken over by the new management Company at Rotterdam, the Netherlands. From then on, the vessel had been engaged in trade between various North European ports. As of week no. 18 of 2022, a new deployment for the Company's fleet was announced, which assigned *Opaline* to sail between Purfleet, UK, and Rotterdam, the Netherlands. With this new schedule, the vessel was in port daily, between 0800 and 1800 in Purfleet and from 0800 to 1900 in Rotterdam, with a layover of two days in port, during weekends.

### Crew

*Opaline's* Minimum Safe Manning Certificate stipulated a crew of 14. Around the time of the occurrence, there were 21 crew members on board, hailing from Ukraine, Romania, and the Philippines.

The chief officer was 40 years old and had started his seafaring career in 2005. He had joined the Company in April 2022, when he embarked on *Opaline* at the port of Rotterdam. He had obtained his STCW<sup>1</sup> II/2 chief mate certificate of competency in 2015. The chief officer had about 10 years of experience on board *Opaline*, under a different management Company. In port, the chief officer was not assigned any watchkeeping duties.

The bosun was 55 years old. He had 34 years of seafaring experience, 12 of which were served in the rank of a bosun in the Company. He was in possession of an STCW II/4 (Rating forming part of a Navigational Watch) qualifications. The bosun had embarked on *Opaline* on 20 April 2022, at Rotterdam. On 11 May 2022, he attended a one-day refresher training course on operating skills of forklift truck RX70-35, while the vessel was at Purfleet. He was not assigned any watches in port and at sea.

The injured able seafarer – deck (AB) had started his career at sea in 2000. He had obtained his STCW II/4 qualifications in 2013. He had spent nine years in this rank, four of which were served in the Company. The AB had joined the vessel at Rotterdam, on 26 April 2022.

### Environment

The vessel's records indicated that on the day of the occurrence, the weather was clear with a calm sea state. A moderate breeze was

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<sup>1</sup> IMO. (2020). *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978* (Consolidated ed.). London: Author.

blowing from the southwest. The air and sea temperatures were recorded as 14 °C and 13 °C, respectively.

### **Narrative<sup>2</sup>**

The vessel was moored alongside the port of Rotterdam, at 0900 of 26 May 2022<sup>3</sup>. Shortly after, the vessel's stern ramp was lowered, although cargo operations were not commenced.

The bosun sought guidance from the chief officer on the jobs to be delegated to the crew members while awaiting the commencement of cargo operations<sup>4</sup>. It was agreed that various maintenance tasks on board had to be carried out. During the toolbox talk meeting, some crew members were assigned de-rusting and painting in the forward area. Cleaning in the accommodation area, maintenance of some lashing tensioners and the washing of the stern ramp were also planned for that day and discussed. The bosun was delegated the supervision of the crew members and to assist in the maintenance of the lashing tensioners.

At noon, the watchman at the stern ramp was relieved of his duties and the AB started his six-hour watch. During lunch time, the chief officer and the bosun agreed that it was time to wash the stern ramp; a task which could be assigned to the bosun and the watchman AB, after 1300. At around 1300, the chief officer discussed the risk assessment for the use of the high-pressure washer machine with the watchman AB, following which, the cleaning of the stern ramp was initiated.

Sometime around 1500, the AB completed the washing of the stern ramp. The bosun

was notified of the task completion and they agreed on washing the starboard bulkhead, adjacent to the stern ramp<sup>5</sup>.

At about 1545, the bosun brought the forklift truck (FLT) to the location, fitted with a steel basket on its forks. The AB climbed inside the basket, which was tied to the FLT with a polypropylene rope<sup>6</sup> (**Figure 1**). At approximately 1550, the bosun lifted the AB, who was standing in the centre of the basket, to a height of approximately 4.5 m from the deck.



**Figure 1: A simulation of how the basket was tied to the FLT. In this photograph, the rope had already parted**

The AB started washing the upper part of the bulkhead with the high-pressure washer machine, slowly moving down the bulkhead. During the process, the bosun was gradually lowering the AB, who was cleaning from top

<sup>2</sup> Unless otherwise specified, all times mentioned in this safety investigation report are in local time (UTC + 2).

<sup>3</sup> The Netherlands was celebrating a national holiday on that day: Ascension Day.

<sup>4</sup> The crew members had not been notified on the estimated commencement time of cargo operations.

<sup>5</sup> During the safety investigation, two versions of events were presented to the MSIU:

1. After washing the stern ramp, the watchman AB suggested to the bosun to wash the starboard bulkhead adjacent to the stern ramp, using a forklift truck to assist in accessing higher locations;
2. Following the afternoon coffee break, the bosun came on the main deck, brought the forklift truck and basket in position, and requested the watchman AB to start washing the bulkhead with the high-pressure washer machine.

<sup>6</sup> The rope used to tie the basket to the forklift had been used as a heaving line in the past.

to bottom. After a while, the bosun left the FLT and started washing the bulkhead from the main deck, using a liquid detergent. The bosun was positioned between the FLT and the stern ramp and he still had a visual on the AB.

At 1600, the AB completed the intended section. Due to the loud noise of the high-pressure washer machine, he moved to the right side of the basket, in the direction of the bosun, and requested that he is lowered down.

As soon as he shifted his position, the rope securing the basket to the FLT broke, and the basket toppled over with the AB. The AB and the basket fell from a height of about 3.5 m (**Figure 2**) to the deck, just missing the bosun.



**Figure 2: Simulation of the FLT set-up, indicating the height of the basket from the main deck**

### **Personal Protective Equipment (PPE)**

At the time of the accident, the AB was wearing a safety helmet, overalls, gloves, and safety boots. *Opaline* was provided with four sets of safety harnesses. However, they were not used during the cleaning task.

### **Injuries sustained by the AB**

Crew members were immediately alerted by the bosun about the accident on the main deck. The chief officer and several other crew members went to the AB's assistance and called an ambulance. By 1630, an

ambulance arrived on site. Medical assistance was provided and then he was transferred to a local hospital.

At the hospital, the AB was diagnosed with multiple facial fractures, a collarbone fracture, and contusion of the right ankle. He required several days of treatment, followed by several days in a rehabilitation facility. He was eventually repatriated on 21 July to continue his medical treatment closer to home.

### **Similar past occurrence – *Ysaline*<sup>7</sup>**

*Ysaline* was a 50,443 gt, Maltese-registered ro-ro vessel, managed by the same Company.

In September 2020, whilst the crew members were preparing to operate a hoistable car deck, a FLT with a wooden box was used to facilitate the transfer of movable stanchions from the lower deck to the hoistable deck. For this purpose, a crew member stood inside the wooden box, handing over the stanchions to other crew members who were positioned on the hoistable deck. At one point, the crew member standing inside the wooden box, turned around, lost his balance, and fell to the deck, injuring his knee.

Following this accident, the Company issued a circular to all vessels in its fleet and prohibited crew members from riding on the FLT.

### **Literature on FLT hazards**

The Code of Safe Working Practices for Merchant Seafarers<sup>8</sup> highlights that: *Personnel other than the driver should not be carried on a truck unless it is constructed or*

<sup>7</sup> [MSIU Report no. 20/2021](#).

<sup>8</sup> MCA (2015). *Code of Safe Practices for Merchant Seafarers*. (Amendment 6, October 2021): Author. Technical Notice SLS.33 of the Maltese flag State Administration recommends this publication to be on board all Maltese-registered vessels.

*adapted for the purpose. Riding on the forks of a fork-lift truck is particularly dangerous.*

In its forklift safety publication<sup>9</sup>, SafeWork South Australia, indicated that personnel should be lifted neither on forks, nor on pallets. It highlighted that work cages should instead be used to lift personnel to execute short-term tasks. Furthermore, it indicated that these cages should be securely attached to the FLT.

Several industry guidelines highlighted the hazards attributed to FLTs, which are unique to these trucks, and a concern when not operated as designed. Several common hazards include FLT rollover, falling loads, personnel falling from forks, crushing injuries, blocked sights, *etc.*

### **Vessel's Safety Management System**

The vessel was still in the process of acquiring the full-term Safety Management Certificate; *Opaline* had been taken over by the Company in January 2022 and as part of the process, an internal audit was carried out during the month of April of the same year. The audit revealed multiple observations on the working environment and compliance with standards.

One observation highlighted that relevant crew members were not provided with FLT and cherry picker familiarisations and required the master to complete these familiarisations by 21 July 2022. This observation also pointed out that seafarers operating a FLT did not have appropriate safety training specific to the type of FLT being operated. Subsequently, the bosun was provided with a one-day refresher training, and passed an operating skills test, taken on the same day.

## **ANALYSIS**

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<sup>9</sup> SafeWork South Australia (2010). *Forklift Safety – reducing the risks*. State of Queensland.

### **Aim**

The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, and to prevent further marine casualties or incidents from occurring in the future.

### **Immediate cause of the accident**

Having completed the washing of the section of the bulkhead that was within his reach, it was necessary for the AB to be lowered down to continue with the washing of the lower part of the bulkhead. Due to the loud noise generated by the high-pressure washer machine, he leaned over, towards the right side of the basket, calling out to the bosun, who was a few metres away towards the stern of the vessel.

While doing so, the AB's centre of gravity shifted outboard of the basket, resulting in an unbalancing force acting on the basket, and which caused an additional strain on the rope securing the basket to the FLT. Consequently, the securing rope parted, the (unsecured) basket toppled over, and the AB fell from a height, sustaining serious injuries.

### **Damaged rope**

The safety investigation requested the Company for the entire damaged rope, to carry out destructive and non-destructive testing. However, the MSIU was informed that the rope was no longer available on board.

### **Unplanned task**

The AB had completed the washing of the ramp by 1500 and there were no other planned tasks for him for that day, except to continue his watchkeeping duties at the stern ramp. Several hours<sup>10</sup> remained for the

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<sup>10</sup> According to a copy of the Table of Shipboard Working Arrangements, the AB's duty would have ended at 1800, while the crew members with non-watchkeeping duties would continue working until around 2100.

working day to be completed and cargo operations had not yet started.

Although presented with two versions of events, the safety investigation considered it irrelevant to analyse whose initiative it was to clean the starboard side bulkhead near the stern ramp. However, the safety investigation took into consideration that the high-pressure washer machine was available on site, the FLT was stored just across the starboard bulkhead near the ramp, and that the AB whose (only) duty was to stand by as watchman, was readily available to clean the dirty hydraulic oil marks on the starboard bulkhead.

The safety investigation believes that this made it easier for the crew members to go ahead with the plan. However, the chief officer had not been notified of the additional task being undertaken by the bosun and the AB, considering that he was available at that time. Neither the bosun nor the AB were able to provide the safety investigation with a clarification on this matter.

It was understood that *Opaline*'s voyages did not allow for long hours of maintenance, due to the short trips and busy cargo operations in port. Since cargo operations had not commenced on the morning of 26 May 2022, the crew members considered it an opportunity to carry out as much maintenance works as possible, in the best interest of the vessel. This may have additionally motivated the crew members to execute more tasks than what had been initially planned.

### **Perception of risk – man riding on the FLT**

For the crew members, the FLT was the best option to execute this task; portable ladders were considered dangerous when working with a pressurised machine at a height. While the AB explained that using the cherry picker would have been ideal, this too was not an option to the crew members. The

cherry picker was located at the forward section of the main deck and the cargo on board did not allow for it to be brought on site<sup>11</sup>.

The bosun recalled that man-riding on the FLT had been occasionally carried out in his past, without any accidents / incidents. This was a 'tried and tested' procedure, and therefore it may have been seen as one which did not require additional risk assessments / approvals before engaging in the task. This was even reflected in the fact that the AB did not use a safety harness while working at a height, in the perceived knowledge that he would be well protected in the basket.

For reasons referred to in the next section of this safety investigation report, the bosun and the AB were not aware of the accident which had occurred on board *Ysaline*<sup>12</sup>. It may be argued that had they been privy to the dynamics of that accident, additional precautions may have been taken or the FLT may not have been used for man riding altogether. Being informed about the dynamics of an accident, raises the awareness of that person in that regard.

### **Familiarisation and the SMM**

The accident on board *Ysaline* had occurred almost two years prior to the events on board *Opaline*. Even though the management Company had promulgated a Circular following the accident on board *Ysaline*, with questions for the crew to engage in discussions, this promulgation had only reached the crew members who were on board the Company's fleet at that time.

Neither the bosun nor the AB were aware of the accident on *Ysaline*, which suggested that both crew members may have been on vacation leave during that time. Subsequently, the information which had

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<sup>11</sup> During the safety investigation, the MSIU was also informed that the cherry picker had a fault, and its certification was not in place.

<sup>12</sup> This point is analyzed in the next section.

been promulgated was missed by these two crew members, as well as all the other crew members who were not on board at the time.

The implementation of the points mentioned in the Circular rested on the intended recipient being aware of it. This type of immaterial barrier<sup>13</sup> is not usually present at the scene of an accident but is designed to inform the user beforehand and prevent an accident with the information presented therein. Furthermore, the chief officer, who also was not aware of the *Ysaline* accident, had just started working with the Company and was only on board *Opaline* for a month when the accident happened.

A thorough internal audit had been carried out by the Company in April 2022. The audit highlighted that familiarisation with ship specific equipment (FLT) had not been provided to deck ratings upon their joining. The target date for rectifying this issue was set for 21 July 2022. However, the accident occurred just about a month after the internal audit.

### **Fatigue, and alcohol**

Both the bosun and the AB's hours of work / rest records indicated that they met the minimum hours stipulated in the MLC, 2006<sup>14</sup>, and STCW Convention. Although the safety investigation could not determine the quality of sleep, there were no behavioural indicators which suggested that the two crew members may have been suffering from fatigue on the day of occurrence, and therefore, the safety investigation did not consider fatigue to have contributed to this accident.

After the accident, no alcohol tests were carried out on the involved crew members.

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<sup>13</sup> Hollnagel, E. (1999). *Accident analysis and barrier functions*.  
[https://www.academia.edu/22733325/Accident\\_analysis\\_and\\_barrier\\_functions?auto=download](https://www.academia.edu/22733325/Accident_analysis_and_barrier_functions?auto=download)

<sup>14</sup> ILO. (2019). *Maritime Labour Convention, 2006*, as amended. Genève: Author.

However, it was reported that no signs of alcohol intoxications had been observed.

### **Other findings**

During the safety investigation, the MSIU was informed that a forklift familiarisation checklist was introduced to the fleet in July 2022, following the accident on board *Opaline*<sup>15</sup>. One of the operational procedures required that *no passenger and lifting people [sic]* were allowed on fork lifters.

### **CONCLUSIONS**

1. The AB fell from a height of about 3.5 m when the basket he was in toppled over after breaking free from its securing arrangements.
2. The crew members wanted to clean the starboard bulkhead, considering that cargo operations had not yet started, and the equipment required for the task was at hand.
3. The crew members decided to use a forklift to reach the higher areas of the bulkhead.
4. The vessel's cherry picker could not be used for the task as it was out of order, and the use of a portable ladder while washing with a high-pressure washer machine was considered dangerous.
5. The crew members were not aware of a similar accident which had occurred on board *Ysaline* two years earlier.
6. The chief officer was not informed on the additional task taken on by the crew members.

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<sup>15</sup> The safety investigation noted that this familiarisation checklist had a creation date of 01 February 2022.

## SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION<sup>16</sup>

Following the accident on board *Opaline*, following safety actions were taken:

1. the chief officer's standing orders were amended to include the prohibition of man riding while operating the FLT;
2. signs to warn the FLT users were posted in the conning position of the FLT (**Figure 3**);
3. the Company issued a Fleetwide Notice to draw the attention of all the crew members on this accident, while reminding crew members of the previous similar occurrence on board *Ysaline*; and
4. a 'Forklift Familiarisation Checklist' was introduced in the SMM, prohibiting people from using the FLT to be lifted to higher areas of the vessel.



**Figure 3: Signs posted on the FLT on board *Opaline***

## RECOMMENDATIONS

The Merchant Shipping Directorate is recommended to:

**08/2023\_R1** publish an Information Notice, highlighting the hazards of forklift operations and drawing attention to this safety investigation report as well as the MSIU's safety investigation report no. [20/2021](#).

<sup>16</sup> Safety actions and recommendations shall not create a presumption of blame and / or liability.



## SHIP PARTICULARS

Vessel Name:	<i>Opaline</i>
Flag:	Malta
Classification Society:	Lloyd's Register of Shipping
IMO Number:	9424869
Type:	Ro-Ro Cargo
Registered Owner:	Shiplux III S.A., Luxembourg
Managers:	Anglo-Eastern Ship Management (NL) B.V.
Construction:	Steel
Length Overall:	195.40 m
Registered Length:	186.22 m
Gross Tonnage:	33960
Minimum Safe Manning:	14
Authorised Cargo:	Ro-Ro units

## VOYAGE PARTICULARS

Port of Departure:	Purfleet, UK
Port of Arrival:	Rotterdam, the Netherlands
Type of Voyage:	Short International Voyage
Cargo Information:	4,033 mt of Ro-Ro units
Manning:	21

## MARINE OCCURRENCE INFORMATION

Date and Time:	26 May 2022 at 1603 (LT)
Classification of Occurrence:	Serious Marine Casualty
Location of Occurrence:	Rotterdam, the Netherlands
Place on Board	Main deck
Injuries / Fatalities:	One seriously injured crew member
Damage / Environmental Impact:	None
Ship Operation:	Moored; Cleaning / washing
Voyage Segment:	Alongside
External & Internal Environment:	The sky was clear, with a calm sea and a Southwesterly moderate breeze. The air and sea temperatures were recorded as 14 °C and 13 °C, respectively.
Persons on board:	21