



SAFETY INVESTIGATION REPORT

201911/028

REPORT NO.: 22/2020

November 2020

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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This safety investigation has been conducted with the assistance and cooperation of Le Bureau d'enquêtes sur les événements de mer (BEAmer).

MV ALMA Fatal fall from the accommodation stairway in position 47° 38.1' N 008° 51.8' W, 22 November 2019

SUMMARY

On 22 November 2019, *Alma* was experiencing heavy weather conditions, while in the Atlantic Ocean on a voyage from Rouen, France, to Cuba. In the evening of the same day, while the bosun was on deck 'A' of the accommodation, he heard something falling, coming from the vicinity of the accommodation stairway.

On looking down the stairway, the bosun found the electrical engineer lying on his back near the bottom of the stairway on the poop deck. The electrical engineer seemed unconscious. The bridge and the master were eventually informed.

The vessel was diverted back towards Brest, France. In the early hours of the next day, the condition of the electrical engineer deteriorated and efforts to resuscitate him were unsuccessful.

The safety investigation did not exclude the possibility that the crew member either lost his stepping or balance due the rolling and pitching motions of the vessel.

Taking into consideration the safety actions taken by the Company, no recommendations were issued by the MSIU.



FACTUAL INFORMATION

Vessel

Alma (Figure 1) was a 17,697 gt bulk carrier, owned by Thalia Maritime Co. Ltd. and managed by Alloceans Shipping Co., Greece. The vessel was built in 2002, by Shina Shipbuilding Co. Ltd. and was classed with the American Bureau of Shipping (ABS). The vessel had a length overall of 169.61 m and a moulded breadth of 27.20 m. At the time of the occurrence, she was drawing a maximum draught of 10.00 m.

Propulsive power was provided by a 6-cylinder, two-stroke, low-speed, STX Man B&W 6S42MC MK 7 marine diesel engine, which produced 6,480 kW of power at 136 rpm. This drove a fixed-pitch propeller, enabling *Alma* to reach an estimated speed of 14 knots.

The fatally injured crew member's and the bosun's cabins were on deck 'A' of the accommodation. The galley, the mess rooms and the recreation rooms were on the poop deck, which was a deck below deck 'A'.

Crew

Alma's Minimum Safe Manning Certificate stipulated a crew of 14. At the time of the occurrence, the vessel was manned by 19 crew members, all of whom were Ukrainian nationals.

The fatally injured electrical engineer was 57 years old. He had 37 years of sea experience, of which 36 years were served in the rank of an electrical engineer. He held STCW¹ III/6 qualifications for an electro-technical officer, and his most recent certificate of competency was issued by the Ukrainian authorities in 2016. He had joined *Alma* on 18 November 2019, from the port of Rouen, France. Prior to joining the vessel, he was found medically fit. He had not been assigned any

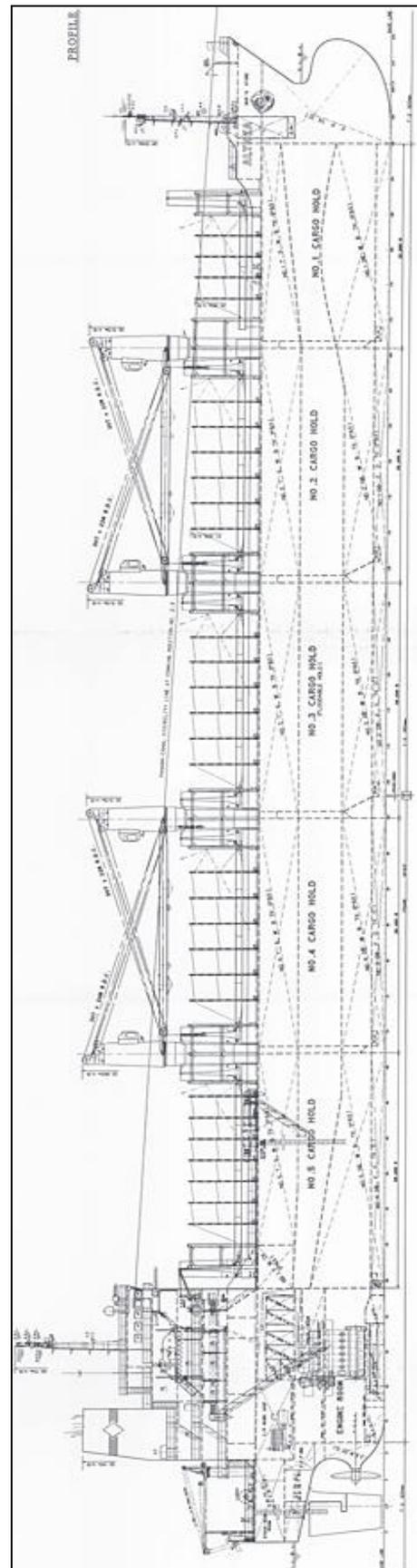


Figure 1: MV *Alma* General Arrangement

¹ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended.

In the meantime, the chief officer had notified the master. Both officers made their way towards the area. They noticed the electrical engineer unconscious and breathing heavily, with no apparent external injuries. The crew members placed a pillow under the electrical engineer's head and covered him with a blanket. His vital signs appeared stable.

Meanwhile on the bridge, the vessel's course was altered to divert towards the nearest port of Brest, France. The Company was contacted for medical assistance at about 2030. Crew members were assigned to monitor the condition of the injured electrical engineer.

At around 2230, the duty AB reported to the bridge that the electrical engineer's condition was deteriorating. The chief officer confirmed that indeed, the medical condition seemed to have deteriorated.

At around 2300, the vessel's local agent at Brest, as well as the Maritime Rescue Coordination Centre (MRCC) of France, contacted the master and informed him that they were making arrangements for a helicopter evacuation.

On 23 November, at about 0120, the injured electrical engineer's breathing became shallower and stopped about five minutes later. No pulse could be detected. Cardio-pulmonary resuscitation (CPR) was commenced by the three crew members on site. At around 0126, the vessel received a call from the rescue helicopter, via the VHF radio, informing them that medical assistance would arrive in about 20 minutes. CPR was eventually stopped after confirmation that the crew member remained unresponsive.

At around 0215, shore medical personnel embarked the vessel to check the condition of the injured electrical engineer but was pronounced dead a few minutes later. At around 0300, the shore medical personnel disembarked, and the vessel resumed passage

to Brest. At around 1410, the vessel anchored off Brest, and the body was landed ashore.

Injuries suffered by the crew member

The autopsy report revealed bruises to the arms and wrists and a fractured skull. The autopsy also revealed cerebral and pulmonary oedema, fluidity of the blood and cyanosis in the shoulder girdle region, which could have been caused by positional asphyxia. The autopsy report also indicated that other injuries on the arms and wrists could have been suffered while trying to avoid / break the fall

Positional asphyxia

Positional (or postural) asphyxia is a form of mechanical asphyxia that occurs when a person is immobilized in a position which impairs adequate pulmonary ventilation and consequently, results in a respiratory failure. In some cases, the body position has a direct hindering effect on normal circulation and venous return to the heart, which may be additional contributing factors to the obstruction of normal gas exchange³.

When considering positional asphyxia as a cause of death, the following three conditions are generally taken into account:

- the positioning of the body in a way which hinders normal breathing;
- an alteration in the cough reflex; and
- an alteration in the righting reflex.

It should be noted that alterations in the cough reflex and the righting reflex may be also related to intoxication (drugs, narcotic substances or alcohol), a neurological disorder or a state of unconsciousness.

³ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6023692/>

Consumption of drugs and/or alcohol

The master did not detect smell of alcohol in the fatally injured crew member's breath, following the accident. During the autopsy, samples were also taken for further toxicological tests.

Stairway

The section of the stairway, at the bottom of which the fatally injured electrical engineer was found, was inclined at an angle of 50° to the horizontal. This section of the stairway consisted of 10 steps, with a riser height of 250 mm and fitted with a handrail on one side (Figures 3).



Figure 3: Section of the stairway, seen from the bottom (poop deck level)

Reportedly, the stairway was well lit and free of defects and slippery substances.

Records of hours of work/rest

The fatally injured crew member's work/rest hour records were noted to be complying

with the relevant requirements of the MLC, 2006⁴.

These records indicated that his rest covered a continuous period of 8.5 hours, prior to commencement of work on 22 November, at 1000. He had worked until 1830 that evening, taking a one-hour break from 1200 to 1300.

ANALYSIS

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.

Cooperation

During the course of this safety investigation, MSIU received all the necessary assistance and cooperation from the Le Bureau d'enquêtes sur les événements de mer (BEAmer).

Cause of the fall

Reportedly, the crew member was walking down the stairway from his cabin on deck 'A' to the poop deck (Figure 4), when the bosun heard him falling down the stairway.

In the absence of any witnesses, the safety investigation could not identify the reason why the fatally injured crew member was heading towards the poop deck. However, it was possible that he had intended to go down to either the mess room or the recreation room.

⁴ Maritime Labour Convention, 2006, as amended.

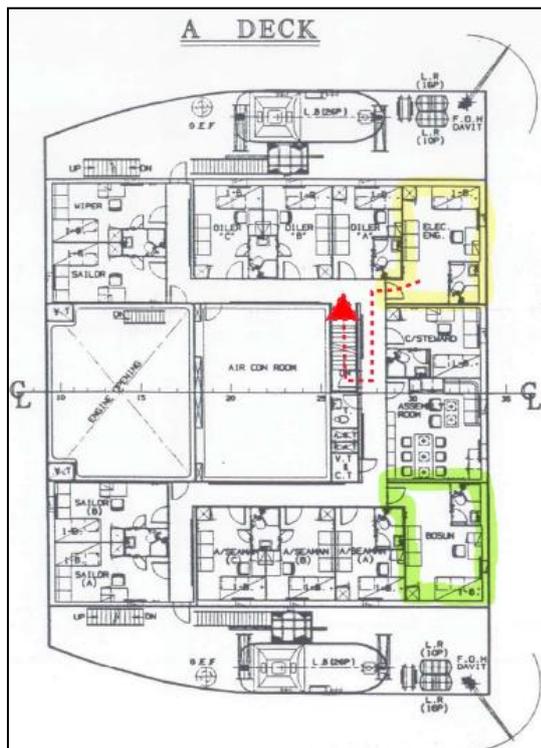


Figure 4: Reported path followed by the fatally injured crew member

As mentioned earlier in this safety investigation report, the stairway was fitted with a handrail and its risers were evenly spaced. Furthermore, it was reportedly well-lit and free of defects and slippery substances.

No items were found in the vicinity of the stairway, which could have indicated that the fatally injured crew member was carrying any items in his hand while walking down the stairway. The shoes worn by the fatally injured crew member were in good condition, with the treads on the soles free of wear (Figure 5).



Figure 5: Sole of the fatally injured crew member's shoe

The safety investigation hypothesized that the fatally injured crew member either lost his stepping or balance, while walking down the stairway, as a result of the rolling and pitching motions of the vessel. The safety investigation did not rule out the possibility that the crew member was not holding on to the handrail, while going down the stairs. It is highly likely that he subsequently toppled down to the bottom of the stairway, fracturing his skull at some point during this fall.

Consumption of drugs and/or alcohol

As mentioned earlier in this safety investigation report, no smell of alcohol was noticed in the fatally injured crew member's breath, following the accident. Furthermore, although the specific toxicological results were not available to the safety investigations, no reference to the presence of drugs and / or alcohol was made in the autopsy report.

Therefore, the consumption of drugs and / or alcohol was neither considered as a contributory factor to the accident nor to positional asphyxia.

Fatigue

The fatally injured crew member had joined the vessel four days prior to the accident, on 18 November 2019. While bearing in mind that it is difficult to ascertain the quality of crew member's rest on board a vessel, however, his records of hours of work/rest did not indicate that he had worked in excess of the limits prescribed by MLC 2006, during any of these days.

Taking the above into account, and in the absence of any evidence to the contrary, the safety investigation is of the opinion that fatigue was not a contributory factor to this accident.

Positional asphyxia

The safety investigation hypothesized that the possible positional asphyxia could have been caused due to the fatally injured crew member's state of unconsciousness, which could have altered his cough and righting reflexes, as well as hindered breathing due to the position his body was in.

Reportedly, the bosun had turned the crew member onto his left side. However, evidence suggested that the crew members had turned him onto his back for the purposes of providing first aid and monitoring his condition, thereafter. It was reported that the crew member was not transferred to the vessel's hospital as the crew members wanted to minimize the possibility of further harm / injury being caused.

While, in hindsight, it may be argued that the possible hindrance to the fatally injured crew member's breathing could have been avoided by placing him in the recovery position, it is highly likely that his unconscious state and the absence of any visible injuries had cast doubts in the crew members' minds.

A medical situation, which must be mitigated by the crew members with no medical background, poses significant challenges. It is a situation where crew members must rely on their diagnosis, miles away from the nearest professional advice. Then, the emergency *per se* poses further dilemmas and emotional stress on the crew members, making the situation more challenging than it would be.

CONCLUSIONS

1. It is highly likely that the fatal injuries were suffered during a fall down the stairway, while the electrical engineer was descending it;
2. The safety investigation hypothesized that the crew member either lost his stepping or balance due the rolling and pitching motions of the vessel, and subsequently toppled down the stairway;
3. The crew member may have not been holding onto the handrail, while descending the stairway;
4. The death of the electrical engineer was caused by a severe head trauma;
5. Positional asphyxia may have contributed to the fatally injured crew member's death;
6. Fatigue, the consumption of drugs / alcohol, the design and condition of the stairway, and footwear worn by the fatally injured crew member were not considered as contributory to this accident.

SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION⁵

Following the accident, the Company circulated the internal investigation report on this occurrence among its fleet of vessels. The internal investigation was carried out in terms of the requirements of the ISM Code.

The investigation report emphasised the importance of serving crew members to exercise caution while using the vessel's stairs, especially when the vessel is experiencing rolling and pitching motions, and to hold onto the handrails for support.

⁵ **Safety actions shall not create a presumption of blame and / or liability.**

SHIP PARTICULARS

Vessel Name:	<i>Alma</i>
Flag:	Malta
Classification Society:	American Bureau of Shipping (ABS)
IMO Number:	9231676
Type:	Bulk Carrier
Registered Owner:	Thalia Maritime Co. Ltd.
Managers:	Alloceans Shipping Co.
Construction:	Steel
Length Overall:	169.62 m
Registered Length:	161.16 m
Gross Tonnage:	17,697
Minimum Safe Manning:	14
Authorised Cargo:	Dry cargo in bulk

VOYAGE PARTICULARS

Port of Departure:	Rouen, France
Port of Arrival:	Cienfuegos, Cuba
Type of Voyage:	International
Cargo Information:	23,900 mt of wheat, in bulk
Manning:	19

MARINE OCCURRENCE INFORMATION

Date and Time:	22 November 2019
Classification of Occurrence:	Very Serious Marine Casualty
Location of Occurrence:	47° 38.1' N 008° 51.8' W
Place on Board	Accommodation – Stairway
Injuries / Fatalities:	One fatality
Damage / Environmental Impact:	None
Ship Operation:	In passage
Voyage Segment:	Transit
External & Internal Environment:	Clear weather with a visibility of 10 nm. 25-knot winds blowing from the North. Rough seas, with swell of 3.5 m height from the Northwest. Air and sea temperatures of 8 °C and 12 °C, respectively.
Persons on board:	19