



Marine Safety Investigation Unit



Transport Malta



MARINE SAFETY INVESTIGATION REPORT

**Fall overboard and subsequent loss of life of a crew member,
while securing a pilot ladder combination arrangement of the
Maltese-registered oil / chemical tanker**

MARINER A,

in position 44° 38.9' N 037° 50.5' E

on 05 February 2023

202302/005

MARINE SAFETY INVESTIGATION REPORT NO. 03/2024

FINAL

Investigations into marine casualties are conducted under the provisions of the Merchant Shipping (Accident and Incident Safety Investigation) Regulations, 2011 and therefore in accordance with Regulation XI-I/6 of the International Convention for the Safety of Life at Sea (SOLAS), and Directive 2009/18/EC of the European Parliament and of the Council of 23 April 2009, establishing the fundamental principles governing the investigation of accidents in the maritime transport sector and amending Council Directive 1999/35/EC and Directive 2002/59/EC of the European Parliament and of the Council.

This safety investigation report is not written, in terms of content and style, 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 objective of this safety investigation report is precautionary and seeks to avoid a repeat occurrence through an understanding of the events of 05 February 2023. Its sole purpose is confined to the promulgation of safety lessons and therefore may be misleading if used for other purposes.

The findings of the safety investigation are not binding on any party and the conclusions reached and recommendations made shall in no case create a presumption of liability (criminal and/or civil) or blame. It should be therefore noted that the content of this safety investigation report does not constitute legal advice in any way and should not be construed as such.

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MARINE SAFETY INVESTIGATION UNIT
A3 Towers
Triq l-Arkata
Paola PLA 1212
Malta

CONTENTS

CONTENTS	iii
LIST OF REFERENCES AND SOURCES OF INFORMATION	iv
GLOSSARY OF TERMS AND ABBREVIATIONS	vi
SUMMARY	viii
1 FACTUAL INFORMATION.....	9
1.1 Vessel, Voyage and Marine Casualty Particulars	9
1.2 Description of Vessel	10
1.3 The Combination Ladder Arrangement.....	12
1.4 Crew	15
1.5 Environment.....	16
1.6 Narrative	17
1.7 Cause of Death.....	20
1.8 Findings after the Accident	20
1.9 Personal Protective Equipment (PPE)	22
1.10 Safety Procedures relating to the Pilot and Accommodation Ladders.....	24
1.10.1 Company's procedures.....	24
1.10.1.1 Safety management manual (SMM).....	24
1.10.1.2 Risk assessment	25
1.10.1.3 Working aloft / overside permit	25
1.10.1.4 Accommodation ladder / gangway / pilot ladder deployment and rigging of pilot ladder checklist.....	25
1.10.2 Vessel's procedures on the day of the accident.....	26
1.11 Records of Hours of Work / Rest.....	27
1.12 Consumption of Drugs and / or Alcohol	27
1.13 Similar Past Occurrences.....	27
2 ANALYSIS	29
2.1 Purpose.....	29
2.2 Cause of Death.....	29
2.3 Probable Cause of the Fall Overboard.....	30
2.4 PPE and Acceptance of Risk.....	32
2.6 Monitoring of the Task	33
2.7 Sufficient Manpower for the Task	34
2.8 The Vessel's Rescue Actions.....	35
2.9 Time between the Fall Overboard and the Recovery of the Bosun.....	35
2.10 Environmental Conditions.....	36
2.11 Fatigue and the Consumption of Drugs / Alcohol	36
3 CONCLUSIONS	39
3.1 Immediate Causes of the Accident.....	39
3.2 Conditions and other Safety Factors	39
4 ACTIONS TAKEN	40
4.1 Safety Actions Taken During the Course of the Safety Investigation	40
5 RECOMMENDATIONS	42

LIST OF REFERENCES AND SOURCES OF INFORMATION

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GLOSSARY OF TERMS AND ABBREVIATIONS

°C	Degree Celsius
AB	Able seafarer – deck
ABS	American Bureau of Shipping
CBT	Computer-based training
DPA	Designated person ashore
ECDIS	Electronic chart display and information system
ETO	Electro-technical officer
GMDSS	Global Maritime Distress and Safety System
gt	Gross tonnage
ISM Code	International Safety Management Code
knot	Nautical mile per hour
KPI	Key performance indicator
kW	Kilowatt
LR	Lloyd’s Register
LT	Local time
m	metre
MARINA	Maritime Industry Authority, the Philippines
MLC, 2006	Maritime Labour Convention, 2006
mt	Metric tonne
nm	Nautical mile
OOW	Officer in charge of a navigational watch
OS	Ordinary seafarer
PA system	Public address system
PPE	Personal protective equipment
ppm	Part per million

rpm	Revolution per minute
SAR	Search and rescue
SMM	Safety management manual
SOLAS	International Convention for the Safety of Life at Sea
STCW	International Convention on Standards of Training, Certification and Watchkeeping for Seafarers
STCW Code	Seafarers' Training, Certification and Watchkeeping Code
TSS	Traffic separation scheme
ULSD	Ultra-low sulphur diesel oil
UMS	Unmanned machinery space
UTC	Coordinated universal time
VDR	Voyage data recorder
VHF	Very high frequency

SUMMARY

Mariner A departed in a loaded condition from the port of Novorossiysk, Russia, in the early morning hours of 05 February 2023. The vessel was bound for the port of Samsun, Türkiye, and was expected to arrive in about 16 hours.

After the pilot disembarked, the master instructed the bosun, via a portable radio, to secure the pilot ladder – accommodation ladder combination arrangement. The bosun and two ordinary seafarers were carrying out this task, with the bosun down at the bottom (platform) of the accommodation ladder that was still inclined and the two ordinary seafarers assisting with the task from the deck.

During the task, the bosun fell overboard. The crew members immediately responded to the emergency and the local authorities were contacted for assistance in recovering the bosun from the water. The bosun was eventually recovered in an unconscious state by a pilot boat and was transferred to a shore hospital. He was pronounced dead on arrival at the hospital, and the death certificate stated the cause of the bosun's passing away as drowning.

The safety investigation found that in all probability, the bosun may have fallen overboard either while trying to adjust the of the accommodation ladder's bottom platform with one hand, after placing the securing pin in the slot, thereby shifting his centre of gravity towards the edge platform and outside, or he may have slipped on the ladder shortly after the pin was inserted into the slot.

On the basis of the conclusions drawn by the safety investigation and the safety actions taken by the Company, no recommendations were issued by the MSIU.

1 FACTUAL INFORMATION

1.1 Vessel, Voyage and Marine Casualty Particulars

Name	<i>Mariner A</i>
Flag	Malta
Classification Society	ABS
IMO Number	9288954
Type	Oil / Chemical Tanker
Registered Owner	Adele Owning Co. Ltd.
Managers	Ancora Investment Trust Inc.
Construction	Steel (Double hull)
Length overall	175.96 m
Registered Length	169.63 m
Gross Tonnage	25,364
Minimum Safe Manning	14
Authorised Cargo	Liquids in bulk
Port of Departure	Novorossiysk, Russian Federation
Port of Arrival	Samsun, Republic of Türkiye
Type of Voyage	Short International
Cargo Information	ULSD 10 ppm (26,798 mt)
Manning	24
Date and Time	05 February 2023 at 03:51 LT
Type of Marine Casualty	Very Serious Marine Casualty
Place on Board	Accommodation ladder (Port side of main deck)
Injuries/Fatalities	One fatality
Damage/Environmental Impact	None
Ship Operation	Normal Service – In passage
Voyage Segment	Transit
External & Internal Environment	Nighttime with overcast sky. Visibility was 8 nm, and a Northeasterly fresh breeze. Sea state was slight, with a Northeasterly swell (0.3 m), and a sea temperature of 13 °C.
Persons on Board	24

1.2 Description of Vessel

Mariner A (**Figure 1**) was a 25,364 gt oil / chemical tanker, built in 2005 by Shina Shipbuilding Co. Ltd., Republic of Korea. The vessel was owned by Adele Owning Co. Ltd. and managed by Ancora Investment Trust Inc., Greece (the Company). American Bureau of Shipping (ABS) acted as the classification society, whilst Llyod's Register (LR) acted as the recognized organization in terms of the International Safety Management Code, for the vessel.

Mariner A had a length overall of 175.96 m, a moulded breadth of 31.00 m, and a moulded depth of 17.20 m. The vessel's summer deadweight was 39,996 mt, which corresponded to a summer draft of 11.09 m and a summer freeboard of 6.13 m.

Propulsive power was provided by a 6-cylinder, two-stroke, single-acting, slow speed, MAN B&W 6S50MC marine diesel engine, which produced 8,561 kW of power at 127 rpm. This drove a fixed-pitch propeller, enabling *Mariner A* to reach a service speed of 15 knots.

The crew members informed the safety investigation that, around the time of the occurrence, the vessel was loaded with about 26,798 mt of ultra-low sulphur diesel oil (ULSD) 10 ppm, and was drawing an even keel draft of 8.80 m. This resulted in a freeboard of 8.40 m¹.

¹ The pilot was informed that the freeboard was about 7.2 m.

GENERAL ARRANGEMENT

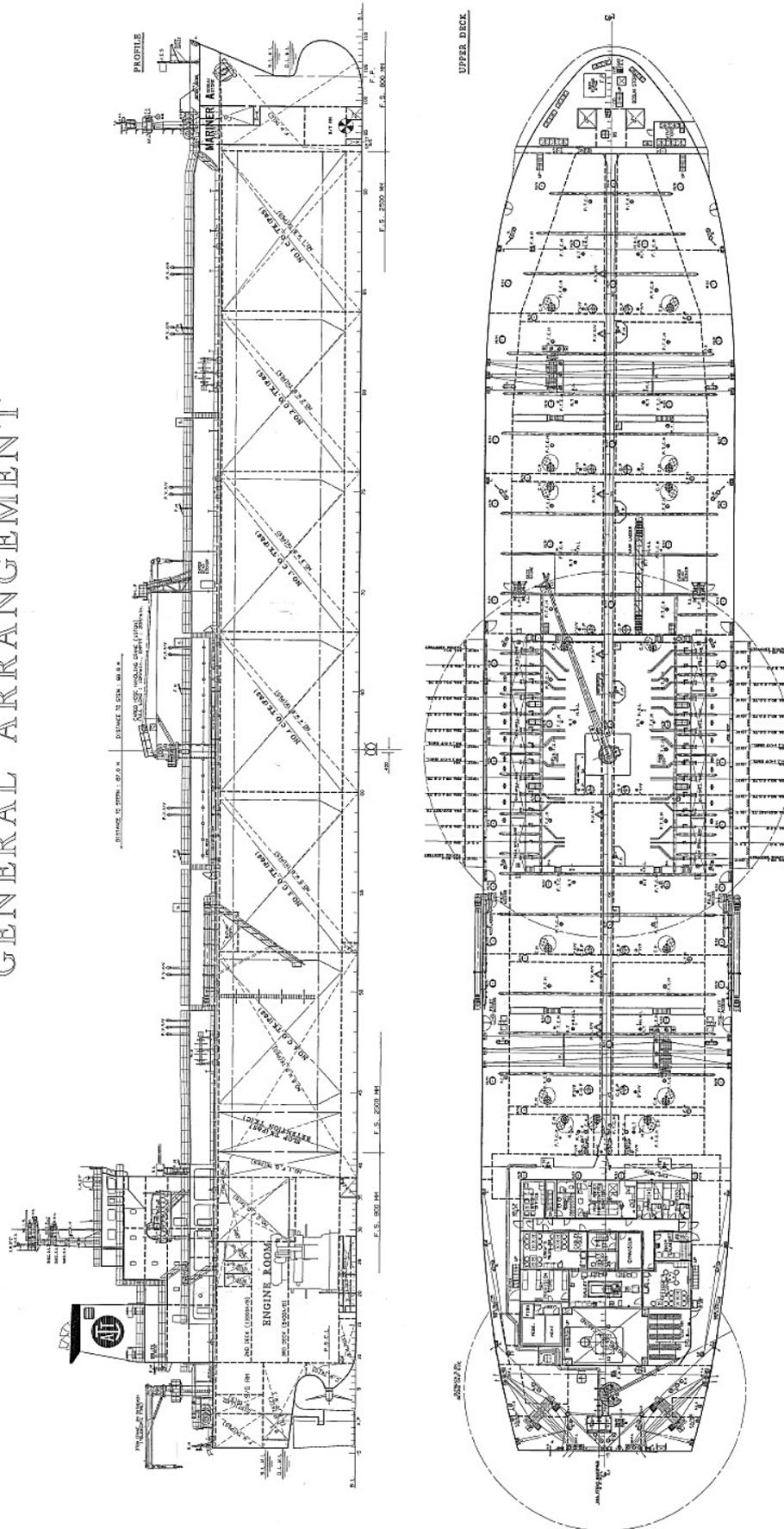


Figure 1: Extract of *Mariner A*'s General Arrangement Plan

1.3 The Combination Ladder Arrangement

The *International Convention for the Safety of Life at Sea, 1974* (SOLAS), regulation V/23, requires vessels to rig up an accommodation ladder in conjunction with a pilot ladder (combination arrangement) whenever the distance from the water surface to the point of access to the vessel exceeds 9 m.

SOLAS regulation V/23 regulates the combination arrangement, in particular the maximum slope of the accommodation ladder, the height of the bottom platform of the accommodation ladder from the sea, the securing of the accommodation ladder, the resting of the pilot ladder to the vessel's side, *etc.*, (**Figure 2**).

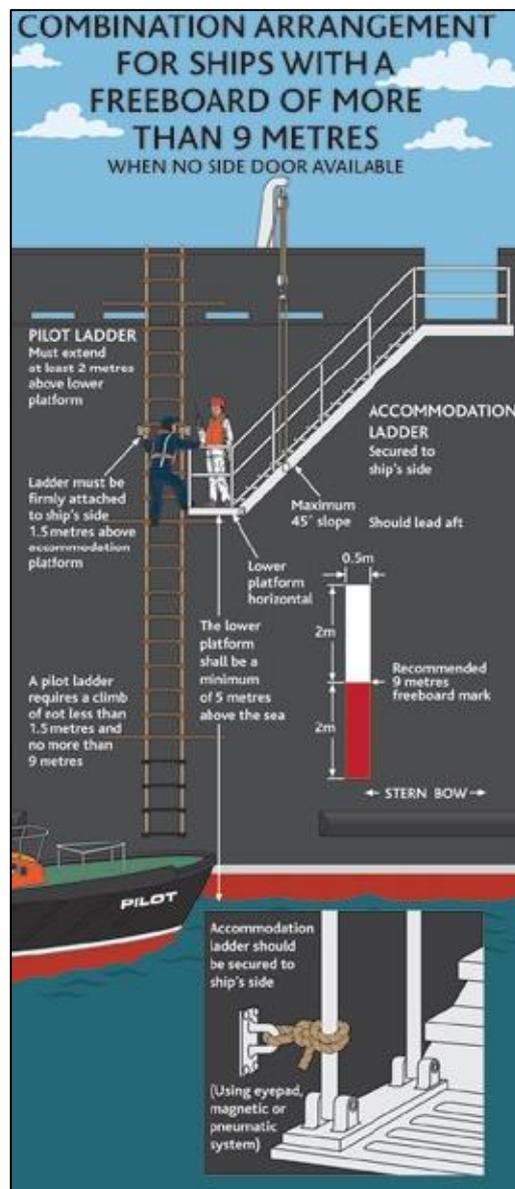


Figure 2: Combination arrangement

Source: International Maritime Pilots' Association

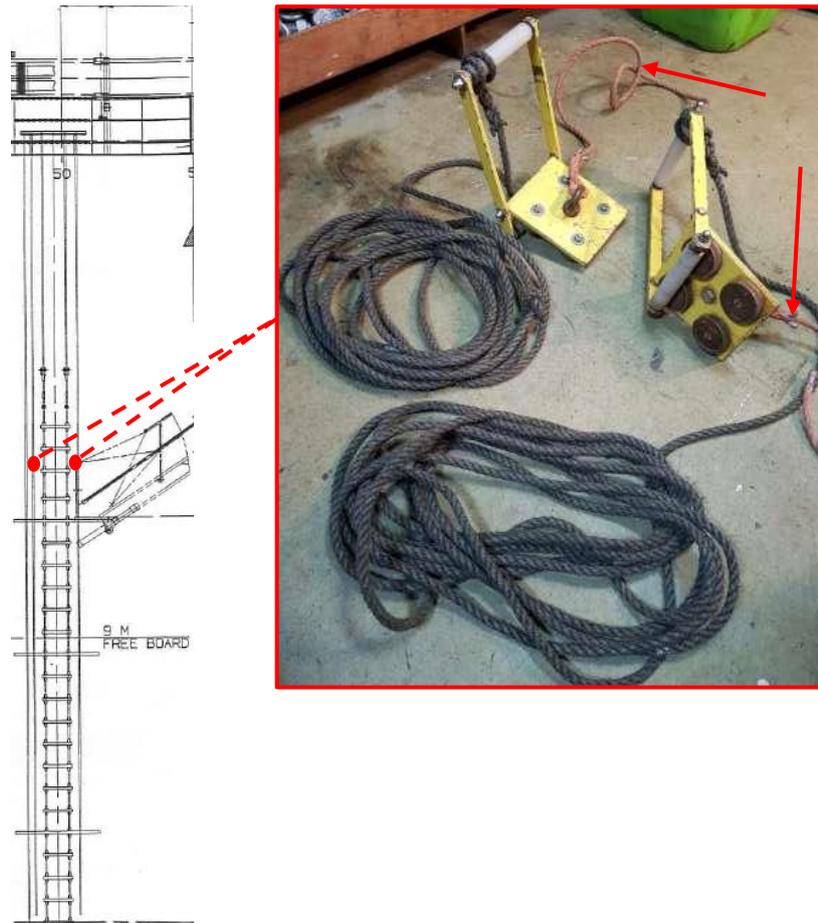


Figure 4: The pilot ladder rigging (red dots: the approximate location at which the magnets would be stuck by the crew members; inset: the magnets)

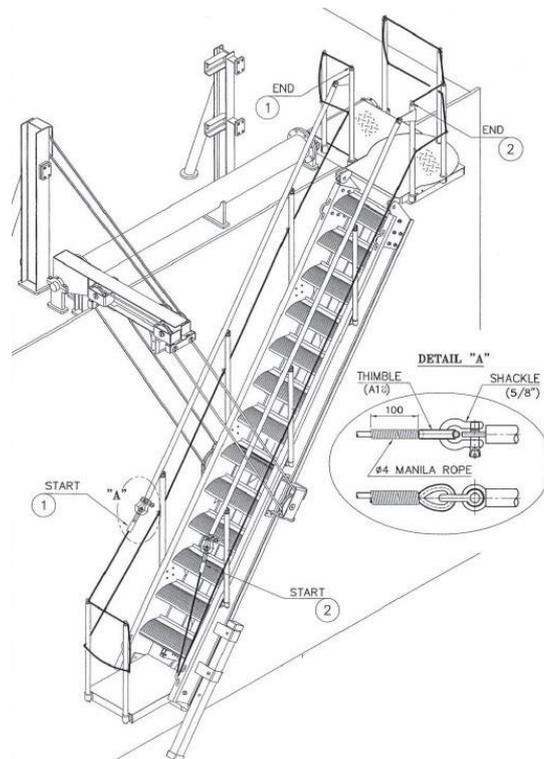


Figure 5: The accommodation ladder

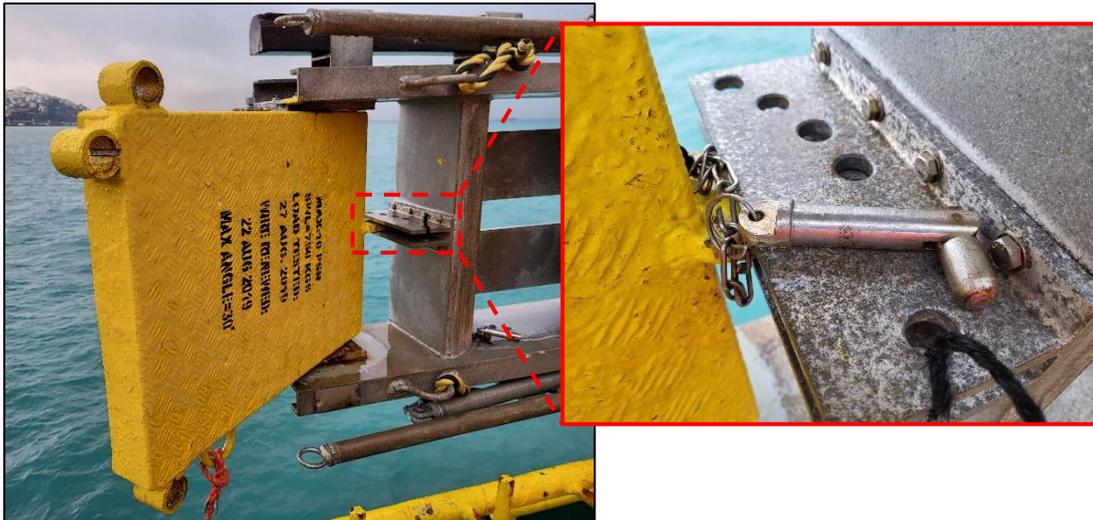


Figure 6: The adjustable lower platform of the accommodation ladder and its securing pin (inset)

1.4 Crew

The Minimum Safe Manning Certificate of *Mariner A* prescribed a crew of 14². Around the time of the occurrence, there were 24 crew members on board, comprising of Greek, Filipino and Bulgarian nationals. Amongst the 24 crew members were two chief officers of Filipino nationality, one of whom was being relieved by the other.

The deceased bosun was a 52-year-old Filipino national. He had about 21 years of seafaring experience, all of which were served with the Company, and around 9 years were served in the rank of a bosun. He held STCW II/5 qualifications; his most recent certificate of proficiency was issued by the Philippines maritime authority (MARINA), in 2017. He had joined the vessel on 22 January 2023, at the port of Istanbul, Republic of Türkiye.

The master was a 61-year-old Greek national. He had about 44 years of seafaring experience, around 26 of which were served in the rank of a master with STCW II/2 qualifications. His certificate of competency was issued by the Greek maritime authority, in 1996. He had been employed with the Company for eight years, and this was his second employment term on *Mariner A*. He had previously signed off from the vessel in March 2022 and had re-joined the vessel on 12 October 2022, at the port of Tutunciftlik, Türkiye.

² Provided that the unmanned machinery space (UMS) and the bridge control systems were operational, and at least two deck officers held Global Maritime Distress and Safety System (GMDSS) General Operator's Certificates.

The chief officer who was in charge around the time of the accident, was 44 years old. He had about 14 years of seafaring experience, all of which were served with the Company. This was his first employment term as a chief officer and his second employment term on *Mariner A*, the first being in the rank of a second officer in 2015. He held STCW II/2 qualifications for a master, and his certificate of competency was issued by MARINA, in 2019. He had joined the vessel on 04 July 2022, at the port of Ashdod, Israel.

One of the ordinary seafarers (OS 1) assisting the bosun, was a 29-year-old Filipino national. He had about five years of seafaring experience, all of which were served with the Company and around four of which were served in the rank of an OS. He held with STCW II/4 qualifications, and his certificate of proficiency was issued by MARINA, in 2017. This was his first employment term on board *Mariner A*. He had joined the vessel on 04 July 2022, along with the chief officer.

The other ordinary seafarer (OS 2) was a 28-year-old Filipino national. He had about seven years of seafaring experience, three of which were served in the rank of an OS. He held with STCW II/1 qualifications, and his certificate of proficiency was issued by MARINA, in 2019. This was his first employment term with the Company, and he, too, had joined the vessel on 04 July 2022.

1.5 Environment

The vessel's records indicated that around the time of this occurrence, it was dark, the sky was overcast, and the visibility was about 8 nm. The wind was blowing from the Northeast, measuring Force 5 on the Beaufort Scale. The sea state was recorded as 'slight', with a 0.3 m-high Northeasterly swell. The sea temperature was recorded as 13 °C.

A thin layer of ice had also been observed on deck by one of the crew members.

1.6 Narrative³

At 0300 of 05 February 2023, after loading cargo at the port of Novorossiysk, Russia, *Mariner A* cast off her mooring lines and departed with a pilot on board and two tugs in assistance. The vessel was bound for the port of Samsun, Türkiye, and was expected to arrive there in about 16 hours.

Around the time of departure, the bridge team consisted of the master, the pilot, a second officer, the deck cadet, and one able seafarer – deck (AB) at the helm. The chief officer, as well as his reliever, were at the forward mooring station, while the other second officer, *i.e.*, the officer in charge of the navigational watch (OOW) from 0000 to 0400, was at the aft mooring station. All deck ratings, which included the bosun, the pumpman, the remaining two ABs, and both OS, were present at either the forward or the aft mooring stations. The engine-room was manned by the chief, second and third engineers, the electro-technical officer (ETO) and an oiler.

At around 0312, after both tugs were cast off, all mooring ropes were secured for the sea voyage. The master requested the OOW to hand over his portable radio to a rating at the aft station and come up to the bridge to relieve the second officer. The pilot then requested for the port side pilot ladder to be rigged up two metres above the water level. The master relayed this request to the chief officer and instructed him to leave one crew member stationed forward, with the others coming aft to prepare the pilot ladder.

Following further discussions between the pilot and the master, it was agreed to have the pilot ladder prepared in a combination arrangement. The pilot advised the master to have the bottom platform of the accommodation ladder at least three metres above the water level, due to the prevailing swell. The master then instructed the bosun to prepare the port side pilot ladder in a combination arrangement, with the pilot ladder two metres above the water level and the accommodation ladder four metres above the water level, after the vessel passed the breakwater. The chief officer recalled that the bosun, the pumpman, one able seafarer – deck (AB 1) and OS 1 were assigned to

³ Unless otherwise specified, all times in this safety investigation report are local (LT = UTC + 3).

this task⁴. By this time, the OOW arrived on the bridge and the master advised the other second officer to proceed to take some rest.

After passing the breakwater at 0320, the crew members rigged up the combination arrangement. The master then advised the chief officer and his reliever to proceed to take some rest⁵. The deck ratings, barring the bosun and both OS, were also advised to get some rest. On his way to the accommodation, the chief officer checked and confirmed that the combination arrangement had been rigged up, as required.

About 25 minutes later, as the pilot was ready to disembark, the OOW switched on the bridge-front floodlights for the port side of the deck and the accommodation ladder. The OOW escorted the pilot to the port side accommodation ladder, once the pilot boat came alongside the vessel. The OOW recalled that while walking to the accommodation ladder, both the pilot and he had slipped and they almost fell on deck, due to a thin layer of ice that had formed on deck. He informed the bosun about this and advised him to be careful.

The pilot disembarked from the vessel at 0348, following which, the master instructed the bosun, via a portable radio, to secure the combination arrangement, while the OOW went back up to the bridge. The course was then altered to 220° (from 155°) and once the vessel was settled on this new course, the steering was put on autopilot and the helmsman was advised to get some rest.

The bosun descended the accommodation ladder to release the pilot ladder magnets and the rope which secured the accommodation ladder to the vessel's side. Once released, the magnets were pulled on deck by the two OS.

At around 0351, just as the two OS were preparing to pull the pilot ladder up, they heard a loud noise, like that of metal striking metal, followed by a splash in the water.

⁴ AB 1 stated that together with the bosun and OS 1, they had carried out this task, with the bosun going down the accommodation ladder and OS 1 and himself rigging up the pilot ladder. He further stated that the bosun was wearing a working life vest and a safety harness, while he and OS 1 wore working life vests, at that time.

⁵ The chief officer informed the safety investigation that due to the cargo operations in port, he had been awake for about 20 hours until this time.

Looking overside, they realized that the bosun had fallen overboard⁶ and they heard him calling for help. OS 1 immediately notified the bridge via his portable radio. They threw the nearest lifebuoy with a heaving line⁷ towards the bosun; however, they observed that he was finding it difficult to swim towards it.

Around that time, the chief engineer was also up on the bridge, having a conversation with the master. They both ran over to the port side bridge wing to assess the situation, while the OOW stopped the engine, switched over to hand steering and turned the wheel hard over to port. Shortly after, the crew members lost visual contact with the bosun. The master then returned to the bridge, while the OOW alerted all crew members through an announcement over the public address (PA) system. The chief engineer rushed down to the engine-room and instructed the second and third engineers to proceed to the deck for lookout duties.

The master informed Novorossiysk traffic control of the man overboard, over the vessel's fixed, two-way, very high frequency (VHF) radio, and requested for assistance to recover the bosun. However, Novorossiysk traffic control did not understand the message, and the master had to repeat it several times. Eventually, Novorossiysk traffic control confirmed receipt of the message and requested the position, bearing and distance from the vessel, of the man overboard position. The master provided Novorossiysk traffic control with the approximate coordinates of the vessel when the bosun fell overboard and informed them that the bosun had fallen overboard about a mile aft of the vessel's present position. Novorossiysk traffic control relayed the information to the pilot boat that had just left the vessel (pilot boat 1). Shortly after, Novorossiysk traffic control advised the master that pilot boat 1 would arrive at the vessel's location in about 10 to 15 minutes⁸.

The master then commenced to turn the vessel around towards the bosun's last known position, and informed Novorossiysk traffic control that a search would need to be conducted as visual contact with the bosun had been lost. Following this, the OOW

⁶ The navigational chart for the area, indicated that the water depth around this location was about 29 m.

⁷ The heaving line was not secured to the vessel.

⁸ The master recalled noticing that pilot boat 1 was continuing to proceed towards another vessel around that time.

transmitted several and frequent urgency calls over VHF channel 16, to inform other vessels in the vicinity of the man overboard.

The crew members stated that at around 0400, they prepared the vessel's rescue boat for lowering. Shortly after, pilot boat 1 returned and commenced a search for the bosun. At around 0424, the pilot boat reported seeing the lifebuoy with the heaving line but did not find the bosun anywhere in its vicinity.

At 0431, the third engineer, who was posted on the poop deck, saw the bosun floating, face-down, in the water off the vessel's starboard quarter. He immediately notified the bridge. The boat proceeded towards the relayed position. Meanwhile, another pilot boat joined in the search and rescue. At about 0440, pilot boat 1 confirmed that the bosun was found but 10 minutes later, the pilot boat's crew were still trying to recover the bosun onto their boat⁹.

At 0521, the crew members observed two additional boats joining the search and rescue efforts. At 0526, the bosun was recovered from the water by pilot boat 1, in an unconscious state, and was taken to the port, from where the bosun was transferred to a local hospital. The bosun was pronounced dead on arrival at the hospital.

At 0630, the vessel anchored in a designated anchorage, as instructed by the local authorities, for the police and immigration authorities' procedures. Due to inclement weather, however, the boarding of the authorities was delayed and the vessel remained at the anchorage until 11 February.

1.7 Cause of Death

The death certificate stated that the cause of death was drowning. No toxicological tests were carried out.

1.8 Findings after the Accident

After the accommodation ladder was heaved in, while the vessel was at the anchorage, the crew members observed that the bottom platform was angled downwards

⁹ The safety investigation was not provided with any information on the recovery equipment that was available on pilot boat 1 and the other boats involved in the search and rescue operation.

(Figure 7). While its securing pin was noticed to be in one of the slots, it was not securing the platform (red circle in Figure 7, and Figure 8). Damages were neither observed on any part the platform, nor the securing pin.



Figure 7: The accommodation ladder, as found immediately after the accident (red circle: position of the securing pin)



Figure 8: The position of the securing pin, as found after the accident (photograph taken by the crew members on 09 February)

1.9 Personal Protective Equipment (PPE)

At the time of the occurrence, the bosun was wearing overalls, winter overalls, a winter jacket, a balaclava, helmet, leather gloves and safety shoes. The bosun was neither wearing a safety harness, nor a working life vest / life jacket (**Figure 9**).



Figure 9: A working life vest, life-jacket and safety harness available on board

The crew members informed the safety investigation that PPE, specifically allocated for the rigging up and securing of the pilot and accommodation ladders, were placed in a box near the accommodation ladder, during the time of port arrival / departure¹⁰ (Figures 10 and 11). Five working life vests, a safety harness and a safety line were stored in the box.

In addition, two safety harnesses, one safety line and three life jackets were placed in other boxes in the midship store, to be used as required.



Figure 10: The PPE box, with the safety harness and safety line on the guard rails



Figure 11: The working life vests inside the PPE box

¹⁰ At sea, this equipment was placed in the vessel's midship store.

1.10 Safety Procedures relating to the Pilot and Accommodation Ladders

1.10.1 Company's procedures

1.10.1.1 Safety management manual (SMM)

The rigging up and securing of pilot / accommodation ladders was addressed in the vessel's SMM sections on 'working aloft / overside' and 'means of access'. The section on working aloft / overside cautioned that the *movements of a ship in a seaway and extreme weather conditions even when alongside, will add to the hazards involved in work of this type [sic.]*. It required that the 'working aloft / overside permit' be completed and signed by competent officers, prior to the commencement of the work, and that all supporting equipment should be checked before a crew member goes

aloft / overside. It further required a life jacket and safety harness to be worn when working overside, and a lifebuoy with sufficient line to be kept ready for immediate use. This section warned that crew members are not to work alone and to always have another crew member on deck, watching and be able to immediately call for assistance. Moreover, this section stated:

Except in emergency situations personnel should not work overside whilst the vessel is underway. If such work has to be undertaken lifeboats or rescue boats should be ready for immediate use. Any such work should be closely monitored/watched by a responsible person [sic.]

The section on 'means of access' required personnel working overside in the rigging of the accommodation ladder to always wear a life jacket and safety harness, and for the 'accommodation ladder / gangway / pilot ladder deployment and rigging of pilot ladder checklist' to be completed prior to the deployment of the accommodation ladder, gangway, or pilot ladder. The section further required inspections of the accommodation ladder to be carried out each time it is being rigged / deployed. The inspections included looking for signs of distortion, cracks, and corrosion on the entire accommodation ladder, including its underside.

Additional PPE prescribed by the Company for working overside included a safety helmet, safety shoes / boots, overalls, and gloves.

1.10.1.2 Risk assessment

The Company had a generic risk assessment prepared for working aloft and overside. The hazards relevant to working overside included fall of personnel, drowning when falling in the water, loss of footing or grip resulting in a fall, and working overside in inclement weather conditions. The existing control measures included completion of the work permit, wearing PPE, a life jacket and safety harness, the presence of a supervisor, having a life buoy with a lifeline ready for immediate use, familiarisation, and training of the crew members. Additional control measures included careful inspection of the PPE and relevant equipment before use, supervision by the chief officer, the involvement of only well-trained personnel, and the avoidance of the task in inclement weather conditions¹¹.

1.10.1.3 Working aloft / overside permit

Amongst others, the working aloft / overside permit required an on-deck supervisor to be identified, checks on the condition of the equipment to be used, the readiness of a life buoy and line, a confirmation that a life jacket and safety harness are being worn, and that the safety line is secured to a strong point.

1.10.1.4 Accommodation ladder / gangway / pilot ladder deployment and rigging of pilot ladder checklist

The accommodation ladder / gangway / pilot ladder deployment and rigging of pilot ladder checklist was a detailed one. It was divided into two parts:

A) General and B) Rigging of Pilot Ladder.

Part A included several checks, such as for sufficient lighting, availability and condition of a life buoy with a light and line, condition of the ladder, *etc.* Checking of the accommodation ladder included the condition and tightness of rope guard rails, condition of the underside of the ladder, wires, *etc.*, that the bottom platform of the ladder was horizontal, inclination of the ladder, stability of the ladder, all stanchions were free of distortion and were properly inserted into their slots, that the boarding area, steps, stanchions and handrails were free of oil, grease, dirt, rust, ice, *etc.*

¹¹ In emergency cases, whereby avoiding the task would present a high risk to personnel, the vessel, its cargo, or the environment, the risk assessment prescribed the involvement of the Company for special approval to carry out the task.

Part B included a confirmation that the ladder was in good condition and was a SOLAS-approved one, presence of a responsible officer for the rigging of the ladder, the various requirements specified in SOLAS were met (relating to height, resting of the ladder against the vessel's side, secured with ropes, safety gear, *etc.*), confirmation that the light would not dazzle the pilot boat's coxswain, and that the tripping line was tied to the lower spreader, led forward, and was clear of the pilot transfer operation.

1.10.2 Vessel's procedures on the day of the accident

The vessel had arrived at the port of Novorossiysk on 04 February 2023. A vessel-specific risk assessment for 'working aloft / deployment and recovery of accommodation/pilot ladder' had been discussed by the chief officer, his reliever, the two second officers, bosun and pumpman. It was then reviewed and approved by the master.

On 05 February, at around 0200 *i.e.*, when all crew members were called to stand by for unberthing, this same risk assessment was further reviewed by the same participants. The chief officer informed the safety investigation that, on both occasions, he had reminded the crew members to don the appropriate safety gear for the task of deployment and recovery of the pilot and accommodation ladders.

Following the review of the risk assessment at the time of the vessel's departure, the chief officer prepared the 'working aloft / overside permit' at 0230. The work description stated in the permit was *Deployment & recovery accommodation & pilot ladder [sic.]*. The bosun, AB 1 and both OS were identified as the personnel who would be carrying out the task, with the bosun identified as the on-deck supervisor for the task and the OOW as the duty officer. The chief officer informed the safety investigation that he checked all the items of the checklist, including the presence of appropriate PPE. The crew members informed the safety investigation that the PPE box had been placed near the port side accommodation ladder, at the time of rigging the combination arrangement for the pilot's disembarkation¹². This permit was signed by the chief officer, OOW, bosun, AB 1 and both OS.

¹² The two OS further confirmed that this PPE box was still in place around the time of the occurrence.

1.11 Records of Hours of Work / Rest

The crew members' records of hours of work / rest indicated that they met the requirements of the STCW Code and MLC, 2006. The bosun's records indicated that he had worked from 0800 till 1400 and then from 1800 till 2000, on 04 February. On 05 February, he reported for duty at 0200.

1.12 Consumption of Drugs and / or Alcohol

Following the accident, all crew members were tested for alcohol. All tests returned negative results.

1.13 Similar Past Occurrences

*Navios Amitie*¹³: the crew members were rigging up a combination arrangement for pilot boarding, whilst the vessel was navigating through the *Çanakkale* traffic separation scheme (TSS). The bosun went down the accommodation ladder to secure the pilot ladder to it when he fell into the water. He was neither wearing a life jacket nor a safety harness. Search and rescue (SAR) operations were unsuccessful and the bosun was not recovered. Similar to the case of *Mariner A*, there were no direct witnesses to the bosun's fall. The safety investigation concluded that the bosun may have lost his balance and / or slipped while securing the pilot ladder to the lower platform of the accommodation ladder.

*Kaata*¹⁴: the chief officer, wearing a safety harness but no lifejacket, was inspecting the vessel's free-fall lifeboat, whilst the vessel was *en route* from Rostock, Germany, to Bekkeri, Estonia. During the inspection, however, the chief officer fell into the water. He was recovered about 2.5 hours later by a SAR helicopter and was pronounced dead on arrival at the shore hospital. As the chief officer's safety harness was equipped with just one hook, the safety investigation concluded that he may have either lost his foothold, or slipped on the wet surface of the lifeboat, while he was shifting the harness' hook from one securing point to another.

¹³ *Vide* MSIU Safety Investigation Report No. [04/2021](#).

¹⁴ *Vide* MSIU Safety Investigation Report No. [16/2022](#).

*Eleandra Baltic*¹⁵: the bosun and an AB were rigging up the port side combination arrangement for pilot boarding on this Marshall Islands-registered vessel. To adjust the lower platform of the accommodation ladder, so that it would be parallel to the water, the AB went down the accommodation ladder, without donning a lifejacket and safety harness. While adjusting the angle of the lower platform, the platform dropped, and the AB fell overboard. The bosun informed the safety investigation that the AB was standing up when the lower platform dropped. The SAR operation conducted by an SAR boat, a helicopter, two pilot boats and the vessel were unsuccessful. The safety investigation found that although the securing pin for the lower platform was in one of the slots of the accommodation ladder, it was not passing through the slot of the lower platform and was, therefore, not securing the angle of the platform (as was the case on board *Mariner A*). Also, the AB was not stopped when the bosun and the bridge team noticed that he was going down the accommodation ladder without wearing a lifejacket and a safety harness. The safety investigation also noted that the lifebuoy with a self-activating smoke signal and a self-igniting light had not been released by the bridge team.

*VS Salome*¹⁶: the master was disembarking onto a service boat, using the pilot ladder. Shortly after commencing his descent, the master's left foot slipped and his shoe came off, causing the master to lose his balance and fall into the water between the vessel and the service boat. He was wearing an inflatable life jacket provided by the service boat's personnel but was carrying a backpack under the life jacket. While the life jacket inflated upon the master's entry into the water. The rough seas did not facilitate his rescue, and although he was recovered by the service boat about 15 minutes after his fall, he was pronounced dead shortly after. The safety investigation concluded that the bulkiness of the master's backpack prevented him from securing the straps of the inflatable life jacket properly, which may have led to the life jacket riding upwards and obstructing his face, thus resulting in either breathing difficulties or water inhalation. The backpack also hampered the rescue efforts of the service boat personnel.

¹⁵ Vide [Eleandra Baltic Casualty Investigation Report](#).

¹⁶ Vide MSIU Safety Investigation Report No. [14/2023](#).

2 ANALYSIS

2.1 Purpose

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

2.2 Cause of Death

The death certificate determined that the cause of death was drowning¹⁷. . The bosun fell overboard at around 0351, after which, the two OS saw him and heard him call for help. They further stated that the bosun was unable to swim towards the lifebuoy which they had thrown towards him. Shortly after, the crew members lost visual contact with the bosun.

The crew members were unable to recall the exact time at which they lost visual contact with the bosun. However, considering that the cause of the bosun's death was drowning, the safety investigation did not exclude that by the time the crew members lost visual contact, the bosun had already started drowning.¹⁸ By 0431, when the crew members regained visual contact, the bosun was floating face-down in the water, and it was highly likely that the bosun may have already drowned by this time.

Bierens, *et. al.* (2016) suggested that after a person's fall in cold water, any intention to hold their breath can be overcome by cold shock (sudden cooling of the skin). The body's response to cold shock may be gasping, hyperventilation, hypertension, *etc.* These responses tend to peak in the first 30 seconds of immersion and then attenuate during the next two to three minutes. These responses, along with an increase in muscle tension, may decrease the time for which a person can hold their breath. The time for which a person can hold their breath is generally 60 to 90 seconds, at a comfortable air temperature. However, this time is drastically reduced to a few seconds in water with temperatures below 15 °C. Moreover, a sensation of intense

¹⁷ Drowning is defined as the process of experiencing respiratory impairment from submersion / immersion in a liquid.

¹⁸ The safety investigation noted that the fastest recorded drowning, analysed by (Hunsucker and Davison, 2010 as cited in Hunsucker and Davison (2013)), was 38 seconds.

cold pain may be felt in water temperatures below 5 °C. The inability to hold one's breath tends to increase the chance of aspiration and drowning after immersion in cold water. Furthermore, upon cold water immersion, the incidence of arrhythmias¹⁹ increases from 2%, when the person is breathing freely with their head out of the water, to 82% if the immersion involves immersion of their face and holding their breath to the maximum.

Following the skin, the next tissues to cool are superficial nerves and muscles, particularly those in the arms. Fatigue occurs at muscle temperatures below 25 °C, as cooling impairs superficial muscle fibres and leaves a smaller number of fibres to produce the same force. At nerve temperatures below 20 °C, nerve conduction is slowed. Nerve block may occur at temperatures between 5 °C and 15 °C and lead to a dysfunction equivalent to peripheral paralysis. It should be noted that drowning caused by physical incapacitation can occur before the deep body temperature falls below 35 °C, *i.e.*, before the progression of hypothermia.

Therefore, and in the absence of hypothermia being indicated as a cause / probable cause of the death, the safety investigation believes that the bosun may have drowned due to the cold shock and subsequent superficial tissue cooling shortly after falling into the water.

2.3 Probable Cause of the Fall Overboard

As none of the crew members witnessed the bosun's fall overboard, the safety investigation was unable to determine the exact dynamics, leading to the fall.

As the crew members found that the bottom platform was angled downwards and its securing pin, while being in one of the slots, was not securing the platform in position, it is highly likely that the bottom platform of the accommodation ladder suddenly slipped out of its intended position at one point. The loud metallic-like sound heard by the two OS, before the splash in the water, may have been that of the accommodation ladder's bottom platform striking the roller beneath it, after the platform slipped down from its position.

¹⁹ An arrhythmia is an abnormal heart rhythm. Electrical impulses may be either too fast, too slow, or even erratic, causing an irregular heartbeat.

Considering that the pilot had just disembarked without any reported issues, using the combination arrangement, the safety investigation was of the opinion that the bosun had intentionally removed the securing pin of the bottom platform in preparation to hoist the ladder. Crew members clarified that the bottom platform's securing pin had to be removed and the platform dropped so that after the ladder is hoisted up and turned inwards, the platform would not interfere with the securing of the ladder. However, it was stated that this was usually done once the accommodation ladder was hoisted up and brought closer to its securing position. While the exact reason for the bosun to release the platform prior to it being hoisted remains unknown, the safety investigation could not exclude the possibility that he may have done so from the following perspectives:

- from past experiences, he may have found the inclination of the platform and / or the removal of the securing pin to be difficult when the accommodation ladder was closer to its securing position; and
- having joined the vessel only a couple of weeks prior, the bosun may not have been aware of the possibility of the platform being inclined after bringing it closer to its securing position.

It is likely that the bosun crouched or knelt down on the bottom rungs of the accommodation ladder, adjusted the bottom platform to facilitate removal of its securing pin, and placed the pin into a vacant slot. For the bottom platform to strike against the roller and the bosun to fall overboard, the safety investigation hypothesized the following:

- the bosun may have (unsuccessfully) tried to control its angle with one hand after placing the securing pin in the slot, thereby shifting his centre of gravity towards the edge of the platform and overside into the water; or
- he may have slipped on the ladder shortly after the pin was placed into the slot, due to the ice accretion mentioned by the OOW.

As the vessel was on a steady course, and on autopilot at the time of the fall overboard, heeling of the vessel due to an alteration of course was ruled out.

2.4 PPE and Acceptance of Risk

The reasons behind crew members not following procedures, even if it is so required by the SMS, vary and may also be complex – they may be organisationally related, but also triggered by the local context and the way it is understood by the crew members. The consideration of these factors is therefore important for the study of human erroneous actions. Of particular interest in this case, was the bosun's decision to go down the accommodation ladder, to make the necessary preparations to have it hoisted up to main deck level.

The safety investigation considered the hazards of working aloft, which were also addressed during the onboard risk assessment, and the mitigating measures (PPE and crew supervision) which were to be in place. The safety investigation also identified a performance variability – a mismatch between work as prescribed and work as carried out.

The bosun was neither wearing a working life vest / lifejacket, nor a safety harness, while working on the accommodation ladder. This does not mean that he was unaware of the risk of falling into the water while working overside. In fact, this risk was also assessed and addressed in the working aloft / overside permit. The bosun was also an experienced seafarer and had served for several years in this rank. One also needs to appreciate the fact that a working life vest (and safety harness) was worn by the bosun when the combination arrangement was being rigged before the pilot's embarkation.

Precisely because the bosun wore the PPE when rigging the combination arrangement, the safety investigation excluded the possible sense of self-efficacy²⁰. The safety investigation concluded that the change in the bosun's acceptance of risk materialised in a few hours, *i.e.*, between the time the combination arrangement was rigged and after the pilot disembarked. The factors, which the safety investigation considered as potentially influencing the bosun not to wear the PPE were:

²⁰ Self-efficacy is the belief that the experience and skill which a person may have, would justify not following basic safety rules and procedures.

- procedures to wear PPE were initially followed, only to realise that this was not workable and therefore did not wear it again during the preparation to hoist the ladder; and
- the time to dismantle the ladder (stanchions, *etc.*) was much shorter than rigging it and therefore there was a perception that the risk was less.

2.6 Monitoring of the Task

The safety investigation is of the opinion that the circumstances on the bridge had drawn the attention of the bridge team away from the work on deck. The OOW was occupied with the navigation of the vessel after the helmsman had been released from bridge duty to take some rest, and the master was engaged in a work-related discussion with the chief engineer.

Moreover, the information available did not suggest that the two OS drew the attention of the bosun on the fact that he was not wearing his PPE. Literature suggests that co-workers tend to look after each other and at individual level, they may warn one another of local hazards, although such approach is more prompted locally rather than as an established rule. The safety investigation, however, did not have information to suggest that this was done, and this was attributed to three main potential reasons:

- the two OS were not aware that the hazards of not wearing PPE had been identified in the risk assessment procedures;
- the two OS' attention may have been elsewhere, and they were not aware that the bosun had gone down the accommodation ladder without wearing PPE; and
- given the relatively short period on board with the bosun, the two OS did not prompt the bosun to wear his PPE before stepping on the accommodation ladder, thereby expecting more self-reliance from the bosun in relation to his safety.

2.7 Sufficient Manpower for the Task

The working aloft / overside permit that was prepared for the deployment and recovery of the combination arrangement, listed the bosun, AB 1 and the two OS as the personnel assigned to the entire task. However, the chief officer recalled having assigned the deployment of the combination arrangement to the bosun, pumpman, AB 1 and OS 1. The deployment of the combination arrangement was eventually carried out by the bosun, AB 1 and OS 1, with the bosun going down the accommodation ladder (wearing a working life vest and safety harness) to secure the pilot ladder.

It is highly likely that the officers would have been aware of this, as the master and OOW were on the bridge and the chief officer was at the forward mooring station when the combination arrangement was deployed. The master and the OOW would also have been aware that the recovery of the combination arrangement was being carried out by the bosun and the two OS. The safety investigation therefore believes that the bosun deemed three crew members to be sufficient for the deployment and recovery of the combination arrangement, due to which, none of the crew members intervened / suggested the use of additional manpower.

Moreover, the recent cargo loading operations and the short, 16-hour voyage to the next port would have put the crew members under pressure to strike a balance between planned tasks and ensuring that all crew members are adequately rested. This explained the master's intention to release crew members from duty, as soon as he felt that they would not be required and advise them to take rest.

Nonetheless, in the safety investigation's view, while additional manpower may have provided the benefit of allowing for the task to be monitored, it may not have prevented the accident from occurring, unless such monitoring was being carried out by a crew member who could have stopped the bosun from going down the accommodation ladder without a safety harness and a working life vest / life jacket.

2.8 The Vessel's Rescue Actions

Following the bosun's fall overboard, the OS notified the bridge and threw the nearest lifebuoy with a heaving line, towards the bosun. On the bridge, the OOW steered the vessel hard over to port and alerted the crew members via a PA system announcement. Lookouts were posted and the master notified the local port authorities via VHF, after which, the OOW transmitted frequent urgency messages over the VHF. The crew members also stated that whilst they had prepared the rescue boat, they had not lowered it to the water since pilot boat 1 had approached the area shortly.

While the aforementioned actions by the crew members were appropriate and were executed in a timely manner, the crew members were unable to explain why the lifebuoy with a self-activating smoke signal and a self-igniting light (which was located on the port side bridge wing, *i.e.*, aft of the man overboard position), was not released. The safety investigation understood that on being alerted of the man overboard, the master rushed out to the bridge wing, while the OOW attended to the required actions within the bridge. The absence of a helmsman / lookout on the bridge necessitated the master and the OOW to improvise over their duties specified in the muster list.

2.9 Time between the Fall Overboard and the Recovery of the Bosun

The bosun was recovered by pilot boat 1 at around 0526, *i.e.*, about 1.5 hours after he fell overboard. Firstly, crucial moments were lost when Novorossiysk traffic control did not understand the master's notification, possibly due to a language barrier. Next, taking into consideration the general speed of a pilot boat, it is highly likely that the pilot boat had reached a considerable distance away from the *Mariner A*, by the time it was notified about the occurrence. Furthermore, in the absence of information on the actions and intentions of pilot boat 1 after being notified about the man overboard, the safety investigation had to also consider the probability that pilot boat 1 may have had a priority to drop off / pick up a pilot from another vessel.

Although the bosun was sighted floating, face-down in the water, off *Mariner A*'s starboard quarter at around 0431, pilot boat 1 was unable to locate him immediately.

This could probably be attributed to the lack of natural light, the absence of a distinguished marker at the approximate location of the fall overboard, and /or the visual or perceptual ‘body blindness’ of pilot boat 1’s personnel, which may have resulted in them being unable to acquire the drowning bosun in their inner or even middle field of vision. Moreover, the VDR recordings did not suggest that *Mariner A*’s crew members had conveyed details of the bosun’s PPE to pilot boat 1.

Additionally, it appeared that the crew members of pilot boat 1 experienced difficulty in recovering the unconscious bosun from the water on the boat. As information on the recovery equipment available on pilot boat 1 or any of the other boats involved in the SAR operation, was not made available to the safety investigation, the reason(s) for this delay in the recovery of the bosun could not be determined by the safety investigation.

Taking into account the low temperature of the water into which the bosun fell, the safety investigation believes that the delay in the recovery of the bosun was a contributory factor to his death.

2.10 Environmental Conditions

As addressed earlier in this safety investigation report, it is highly likely that certain environmental conditions, namely: the possible ice accretion on the accommodation ladder and the cold water, may have contributed to the fall of the bosun overboard and his drowning.

2.11 Fatigue and the Consumption of Drugs / Alcohol

Whilst the bosun’s hours of work / rest met the relevant requirements, the safety investigation was unable to verify the quality of his rest. Furthermore, as toxicological tests were not conducted, the safety investigation was unable to confirm whether the bosun may have been under influence of any drugs / alcohol, around the time of the occurrence, or not.

Nonetheless, in the absence of evidence which would suggest that the bosun’s behaviour and /or actions were symptomatic of fatigue or intoxication, the safety

investigation did not consider accumulated fatigue and drug / alcohol consumption as contributory factors to this occurrence.

**THE FOLLOWING CONCLUSIONS AND SAFETY
ACTIONS SHALL IN NO CASE CREATE A
PRESUMPTION OF BLAME OR LIABILITY.
NEITHER ARE THEY LISTED IN ANY ORDER OF
PRIORITY.**

3 CONCLUSIONS

Findings and safety factors are not listed in any order of priority.

3.1 Immediate Causes of the Accident

- .1 The bosun drowned after he fell from the accommodation ladder, while preparing the pilot ladder – accommodation ladder combination arrangement for recovery.
- .2 The bosun may have drowned due to cold shock and subsequent superficial tissue cooling, shortly after falling into the water.
- .3 The bosun may have fallen overboard either while trying to adjust the accommodation ladder's bottom platform with one hand, after placing the securing pin in the slot, thereby shifting his centre of gravity towards the edge platform and outside, or he may have slipped on the ladder shortly after the pin was placed into the slot, due to the ice accretion.

3.2 Conditions and other Safety Factors

- .1 The bosun was neither wearing a safety harness nor a working life vest / life jacket, while working on the accommodation ladder.
- .2 It is possible that the bosun may have perceived a life jacket and a safety harness as a hindrance to performing the task.
- .3 The bosun accepted the risks associated with not wearing a working life vest / life jacket and a safety harness.
- .4 Data available to the safety investigation suggested that the task was not being monitored by other crew members.
- .5 The lifebuoy with a self-activating smoke signal and a self-igniting light, which was located on the port side bridge wing, was not released. The absence of a helmsman / lookout required the master and the OOW to improvise over their duties specified in the muster list, and this may have led to them to overlook the release of the lifebuoy.

- .6 About 40 minutes after the bosun fell overboard, he was seen floating face-down in the water, and it was highly likely that he had already drowned by that time.
- .7 The bosun was only recovered about 1.5 hours after he fell overboard. Taking into account the low temperature of the water into which the bosun fell, the safety investigation believes that the delay in the recovery of the bosun was a contributory factor to his death.

4 ACTIONS TAKEN

4.1 Safety Actions Taken During the Course of the Safety Investigation

Following the occurrence, the Company took the following safety actions:

1. an accident notification / safety flash was immediately disseminated amongst its fleet and, on completion of the Company's internal investigation report, the report was promulgated to its fleet and also discussed during the Company's management review meeting;
2. online conference calls were carried out with its seafarers, those who were on board as well as ashore, to identify the practices that were being followed for the rigging and securing of the combination arrangement, the seafarers' risk perception and awareness relating to this task, and the adequacy of the work plan for this task;
3. informed its crew manning agencies about the accident and instructed them to provide a safety notice on this matter, during the pre-joining briefings of all seafarers joining from their offices;
4. updated inventories of PPE required for the rigging and securing of combination arrangements were collected from all vessels, and arrangement were made to replenish missing PPE where required;
5. retractable fall arresting devices were supplied to all vessels in its fleet;
6. using the example of the practice on board *Mariner A*, the Company advised all vessels to have a dedicated storage box for PPE required for the rigging and securing of pilot and accommodation ladders;

7. all vessels in its fleet were instructed to post warning signs near the accommodation ladders, to remind crew members to don a working life vest / life jacket and a safety harness when working overside, and that the work is to be continuously supervised by other crew members;
8. a safety campaign was launched across its fleet to verify and assess the safe working practices followed for the rigging and securing of pilot and accommodation ladders;
9. the causes of the accident and the lessons learned, as identified by the Company's internal investigation, were added to the agenda of the Company's annual senior officers' conference;
10. a shore-based training organization was contracted to organize a webinar and refresher training for its seafarers, to address safety culture, awareness, and behaviour;
11. provided new coveralls to all crew members, affixed with a safety badge to serve as a continuous reminder on the importance of safe actions and behaviour;
12. the Company's procedures, work permit and risk assessment, relating to working overside were reviewed and revised to provide additional emphasis on the required precautionary measures and the severity of the consequences in the case of non-compliance;
13. the Company's computer-based training (CBT) program was upgraded to include, amongst others, modules on the use of PPE, slips, trips and falls, human behaviour, safe gangway and ladder operations and safety culture;
14. the crew manning agencies were instructed to verify that all newly promoted bosuns completed the CBT modules on the use of PPE and safe gangway and ladder operations, prior to joining the Company's vessels;
15. introduced monthly cause analyses of reported near-miss cases, aimed at identifying signs of hidden / less-obvious risks which could compromise on-board safety, with the results being promulgated across its fleet;
16. aimed at improving the key performance indicators for the Managers' Safety leadership visits of eight per year and promote safety culture during the visits through the formal safety meetings with all the available crew members; and

17. commenced emphasizing the Company's procedures for working overside, to all masters and deck officers, during their pre-joining briefing.

5 RECOMMENDATIONS

In view of the conclusions reached and taking into consideration the safety actions taken during the course of the safety investigation, no recommendations were issued by the MSIU.