

Final Report

MAN OVERBOARD RESULTING IN DEATH INVOLVING SRS PROTEUS HARVONNE AT SOUTH KOREA ANCHORAGE ON 24 MAY 2024

TIB/MAI/CAS.168

Transport Safety Investigation Bureau of Singapore
Ministry of Transport
Singapore

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The Transport Safety Investigation Bureau of Singapore

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ABBREVIATIONS

DNV	Det Norske Veritas
DOC	Document of Compliance
ISM	International Safety Management
KCG	Korea Coast Guard
m	Meters
MOB	Man Overboard
PH	Proteus Harvonne
PRC	People's Republic of China
SAR	Search and Rescue
SOLAS	Safety of Life At Sea
SMS	Safety Management System
VHF	Very High Frequency
VTS	Vessel Traffic Scheme

Designation (Relevant Personnel)

Able Seafarer Deck	ASD
Bosun	BSN
Chief Engineer	CE
Chief Mate	CM
OSM	Off-Signing Master
Pumpman	PM
Second Engineer	2E
Third Mate	3M

SYNOPSIS

On the evening of 23 May 2024, the Singapore-registered tanker Proteus Harvonne arrived at Ulsan Anchorage, South Korea, in ballast condition, for scheduled operations, including bunkering and a change of Master.

The following morning, at approximately 0848H on 24 May 2024, moderate to rough sea conditions were recorded, with swells of 1 to 2 meters and a northeasterly wind of 17 knots. After completing the handover, the Off-Signing Master (OSM) prepared to disembark using the starboard accommodation ladder. As the OSM descended the pilot ladder, the service boat attempted to come alongside. However, due to the rough seas, the boat struggled to align properly with the ladder. On the second attempt, the OSM lost his grip and fell into the sea. He was recovered by the Korea Coast Guard, unconscious, and taken to the hospital, where he was declared dead upon arrival.

The Transport Safety Investigation Bureau of Singapore classified the occurrence as a very serious marine casualty.

Autopsy was not conducted on the OSM and the death certificate from Hankuk Forensic Medical Services suspected drowning as the cause.

The investigation found that rough weather conditions were not adequately assessed during the transfer planning and had likely contributed to the man overboard event. A more thorough risk assessment should have been conducted, given the challenging sea conditions. Safer alternatives, such as waiting for calmer seas or conducting the transfer in a sheltered area, should have been considered.

The OSM was not wearing lifejacket and was carrying a backpack during his disembarkation, which was not in accordance with the Safety Management System (SMS) requirements. According to the Chief Mate (CM), prior to disembarking, he had advised the OSM to remove his backpack and to wear a lifejacket, however, the CM did not exercise the Stop Work Card when the OSM refused to do so. The occurrence demonstrated that the SMS was not effectively implemented onboard Proteus Harvonne.

VIEW OF VESSEL



DETAILS OF VESSEL

Name	Proteus Harvonne
IMO Number	9923401
Official No.	402892
Classification society	DNV
Ship type	Tanker
Year Built	May 2022
Company / Operator	Bernhard Schulte Shipmanagement (Singapore) Pte. Ltd.
Gross tonnage	66,982
Length overall	249.942m
Breadth	44.0m
Depth	22.0m

Main engine(s)	Win G&D W6X62DF @M.C.R. 11000kW
Propellers	Fixed type 4 blades 8.10 diameter
Remarks	<p>At the time of the MOB occurrence, the ship in ballast condition, was riding to its starboard anchor with 11 shackles in the water.</p> <p>Draft Forward: 5.80m</p> <p>Draft Midship: 7.15m</p> <p>Draft Aft: 8.50m</p> <p>Freeboard: 14.85m</p>

1 FACTUAL INFORMATION

All times used in this report are Korean Local Time (LT) unless otherwise stated. Korean Local Time is nine hours (H) ahead of Coordinated Universal Time (UTC¹).

1.1 Sequence of events

1.1.1 On 23 May 2024, at approximately 2142H, the Singapore-registered tanker "Proteus Harvonne" (PH), in ballast condition, arrived at Ulsan anchorage², South Korea from Oita, Japan. The ship anchored for scheduled bunkering, de-slopping, store pick-up, and change of Master. The probable³ next port of call of PH was Daesan, Korea, for loading, with an estimated time of arrival at midnight on 29 May 2024.

1.1.2 At about 2248H, the bunker barge came alongside and made fast on the starboard side. In anticipation of the ship's engineer and bunker surveyor embarking PH for the bunkering operation from the bunker barge, the Chief Mate (CM) had instructed the Bosun (BSN) and deck crew to prepare a combination ladder⁴ on the starboard side as the ship's freeboard was about 14.85m (See **figures 1**).



Figure 1 – Illustrating the combination ladder arrangement. *Source:* The Company. Annotation by TSIB.

¹ UTC is the primary time standard for the world. It ensures uniform timekeeping globally, used in navigation, communication and data transmission.

² At Ulsan, South Korea Anchorage, Latitude: 35° 24.79' N / Longitude: 129° 28.01' E

³ The voyage was not confirmed at the time of the occurrence.

⁴ Comprising pilot ladder and accommodation ladder.

1.1.3 After the bunkering operation was completed on the next morning at about 0236H, the starboard combination ladder was left in rigged position in preparation for the upcoming change of Master. (See **figure 2.**)

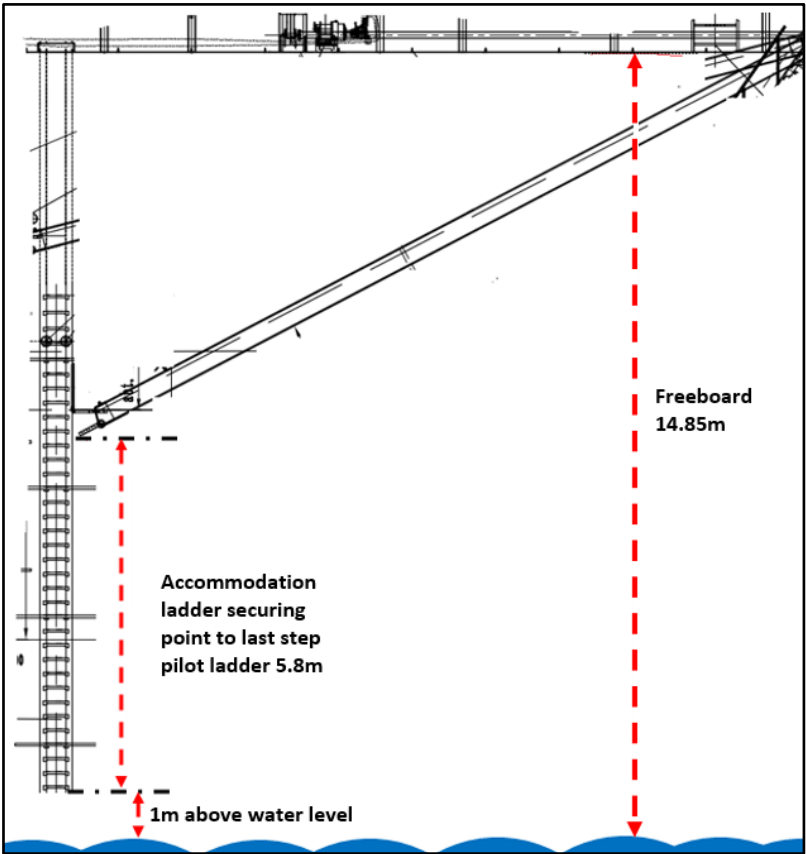


Figure 2 – Illustrating the combination ladder shown on the starboard side
Source: The Company. Annotation by TSIB

1.1.4 On 24 May 2024, at about 0800H, PH was heading at 352°, the Third Mate (3M) serving as the Officer of the Watch (OOW) recorded the weather conditions as cloudy and visibility ranging from 5km to 10km. The wind was from northeast at about 17 knots, with seas and swell from north-northeast ranged between 1m to 2m⁵. The sea current was setting towards 337° at about 1.1 knots. (See **figure 3**). During this time, a service boat ferrying the new Master arrived.

⁵ The crest of the swell occasionally struck the lower steps of the pilot ladder, causing it to sway and making it difficult for individuals to maintain a stable footing and a secure grip.

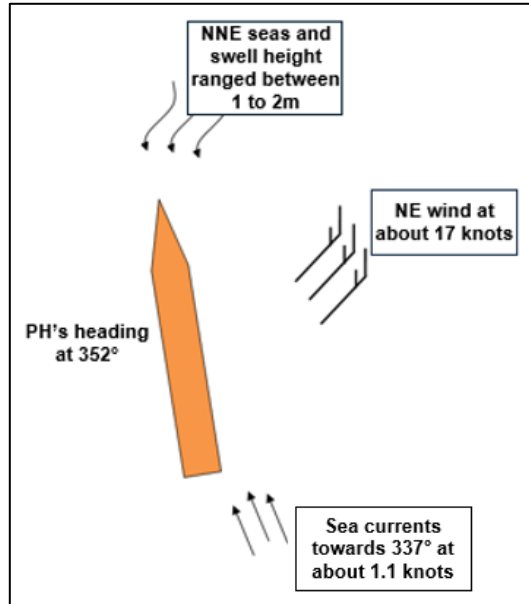


Figure 3 – Illustration of the weather and sea conditions relative to PH at 0800H. *Source:* The Company. Annotation by TSIB

- 1.1.5 At about 0815H, the new Master boarded PH from the rigged combination ladder on the starboard side to effect a change of command with the Off-Signing Master (OSM).
- 1.1.5.1 The handover between the two Masters was friendly and conversational and did not appear to be particularly rushed. The handover⁶ concluded at about 0848H, at which point the OSM informed the new Master that he would be leaving the bridge. Subsequently, the OSM was escorted by the CM (overseeing the safe transfer operation) to the starboard side accommodation ladder to prepare for disembarking PH. The same service boat that brought the new Master, operated by two crew (a helmsman and a deckhand), was waiting nearby to come alongside PH to bring the OSM to shore. According to the CM, the OSM was carrying a backpack and wearing a pair of sport shoes but not wearing a personal flotation device (hereinafter referred to as a lifejacket). The CM mentioned that he had requested the OSM to remove the backpack and use a lifejacket, but the OSM declined, saying it was not required. The CM did not challenge the OSM.
- 1.1.6 At the starboard accommodation ladder, an Able Seafarer Deck (ASD) on duty

⁶ Reported by the Company as heard from the Voyage Data Recorder.

assisted in lowering the OSM's luggage (a total of three bags) to the service boat deckhand⁷. Once the luggage were safely transferred, the boat moved a short distance away but remained in proximity, awaiting the OSM's descent.

1.1.7 The OSM, after bidding farewell to the crew, began his descent from the accommodation ladder. At this time, PH's orientation was heading northerly, with the weather and wind conditions remaining largely the same as at 0800H. After the OSM reached the bottom platform of the accommodation ladder, he signalled to the service boat and waited for it to approach before transferring to the pilot ladder to continue his descent.

1.1.8 The transfer team, consisted of the CM and the ASD who were standing near the top platform of the accommodation ladder and the pilot ladder on deck respectively, was observing the descent of the OSM. The Pumpman (PM), who came to bid farewell to the OSM, stood near to the ASD. See **figure 4** - illustration indicating positions of the crew at the time of the occurrence.

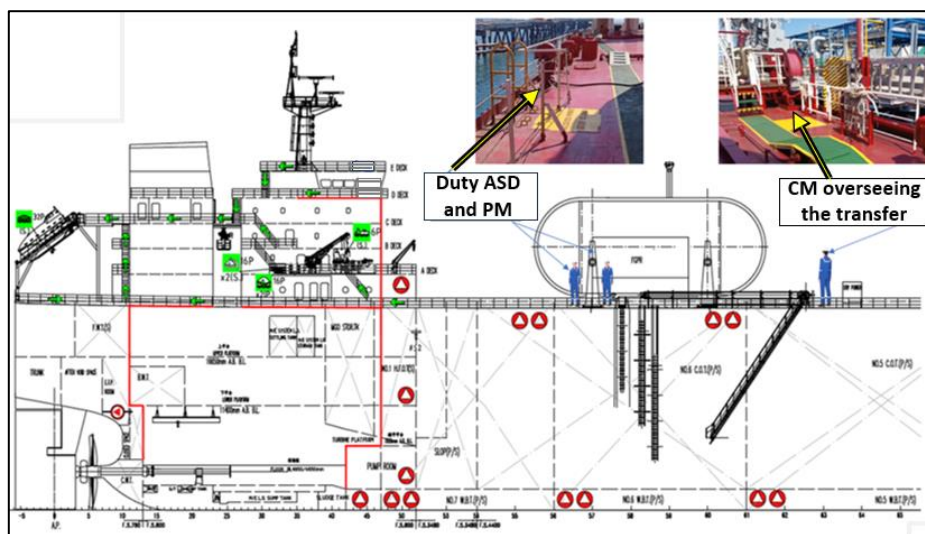


Figure 4 - Indicating positions of the crew at the time of the occurrence.

Source: The Company. Annotation by TSIB.

1.1.9 The OSM continued his descent on the pilot ladder, stopping a few rungs just above the deck level of the service boat, waiting to transfer to the service boat. The service boat, with the deckhand guiding, approached PH by reversing towards the pilot ladder. The OSM descended the pilot ladder further to align

⁷ The 3M was watching the transfer of the OSM's luggage from the starboard bridge wing and went back to the bridge after the transfer of the luggage.

himself with the service boat deck for the transfer. During the first attempt to approach PH, due to heavy swell, the service boat failed to get close to the pilot ladder and was pushed forward. See **figure 5** – indicating the service boat angle of approach towards the pilot ladder.

- 1.1.10 The transfer operation continued despite the boat heaving and pitching due to sea swells.

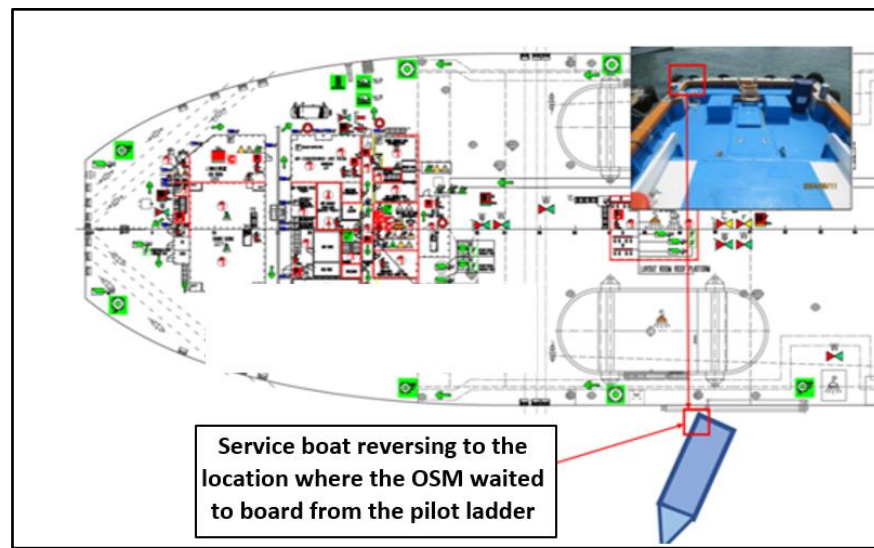


Figure 5 – Indicating the service boat angle of approach. *Source:* The Company. Annotation by TSIB. (Not to scale)

- 1.1.11 According to the statement of the PH and service boat crew who were on scene, the service boat moved out for a second attempt and as it approached again, before getting close to the pilot ladder, the OSM lost his grip from the pilot ladder and fell into the sea⁸. The investigation noted from the Company's⁹ report, which referenced an excerpt from the P&I¹⁰ investigator's findings, that the OSM fell into the sea when he let go of his hands after putting one foot on the service boat.

- 1.1.12 The CM immediately reported the 'Man Overboard' (MOB) incident to the

⁸ It was not known to the investigation team how far the service boat was away from the pilot ladder when the OSM fell into the water.

⁹ The Company stated that their report was based on the P&I excerpt, and they did not verify which crew member provided the information to the P&I.

¹⁰ P&I stands for Protection and Indemnity. P&I clubs are mutual insurance associations that offer liability coverage for the maritime industry. These clubs protect against broad spectrum of risks, including personal injury, environmental damage, etc., which are usually not covered by the standard marine insurance policies.

- bridge. The ASD and PM quickly threw a total of three lifebuoys (one with buoyant lifeline and two without buoyant lifeline) from the ship to the OSM in the water. The OSM managed to grab onto one of the lifebuoys without buoyant lifeline. The lifebuoy with buoyant lifeline got fouled with the accommodation ladder railing. Following that, the service boat deckhand threw in a rope which was grabbed by the OSM. Seeing that the OSM was holding onto the rope and lifebuoy, the CM immediately went to the rescue boat to prepare for launching and informed the bridge.
- 1.1.13 According to the crew of the service boat, they approached the OSM and made several attempts to lift him onboard from the aft part of the boat but were not successful. Despite their efforts, the situation became increasingly challenging as the boat heaved and pitched due to sea swells. The OSM struggled to maintain his grip on the lifebuoy and the rope. After several minutes of holding on, the OSM appeared exhausted and lost his grip on both the lifebuoy and the rope and was subsequently swept away by the strong sea current.
- 1.1.14 The service boat began tracking and following the OSM as he drifted about 200m forward of PH's port bow. Due to the challenging sea conditions, it was difficult to maintain a visual on the OSM's position in the water.
- 1.1.15 The 3M, who was on the bridge preparing for the ship's departure, upon receiving the MOB information from the CM, immediately sounded the general alarm and announced the MOB on the PA system at around 0908H, instructing the crew to muster at the rescue boat deck.
- 1.1.16 A moment later, the 3M was joined by the other members of the bridge team, comprising the Master and one ASD. The team began executing the emergency procedure for MOB. They placed a MOB marker on the Electronic Chart Display and Information System (ECDIS) and continued with emergency communications, sending distress alert and messages on the VHF radio. The team reported the MOB occurrence to the Vessel Traffic Service (VTS) and received acknowledgment. They then followed up with a report to the Company and the local agent and seek assistance.
- 1.1.17 At the engine control room, the engineers, who were preparing the ship's machinery for departure, were alerted by the general alarm and MOB announcement. The Chief Engineer (CE) directed the engine room team to the muster station while he remained in the engine control room to standby the engine for any required operations.

- 1.1.18 The crew began mustering at the rescue boat deck to prepare for the rescue operation. Following the CM's instructions, the crew prepared the rescue boat for launching.
- 1.1.19 At around 0915H, the rescue boat, manned by the CM, 2E, BSN, and Wiper, was launched onto the sea to rescue the OSM. However, heavy sea swells significantly hindered their progress towards the service boat, which by this time had moved to the forward of the ship. Meanwhile, additional lookouts with binoculars were posted on the bridge, forecandle deck, and along the forward section of the ship to assist in tracking the OSM.
- 1.1.20 At about 0925H, the bridge team was informed by VTS that the Korea Coast Guard (KCG) was on the way to PH for the Search and Rescue (SAR) operation. At about 0936H, the KCG craft P-37 arrived on site and deployed their rescue boat.
- 1.1.21 Once the KCG P-37 approached the OSM, the KCG rescue personnel entered the water and retrieved the unconscious OSM from the sea. At about 0941H, the KCG P-37 reported that the OSM had been recovered and was being transported to a shore hospital. The SAR operation was then terminated.
- 1.1.22 While PH's rescue team endeavoured against the heavy swells, they received information from the bridge that the KCG had rescued the OSM. Upon confirmation from both the KCG and the VTS, the distress alert and MOB marker were cancelled. At about 0950H, PH's rescue boat was retrieved onboard and secured.
- 1.1.23 Around 1000H, the OSM was brought ashore by the KCG and transferred to an ambulance. He was then taken to Ulsan University Hospital, arriving at approximately 1008H. At about 1039H, the doctor at Ulsan University pronounced the OSM dead.
- 1.1.24 Following the occurrence, the VTS instructed PH to remain at anchor to assist in the investigation conducted by the Korean Marine Police.
- 1.1.25 On the morning of 26 May 2024, after about two days at anchorage, PH was granted port clearance to continue its voyage and left the port of Ulsan.

1.2 Crew's qualifications, roster and roles.

1.2.1 Table 1 indicates crew members were involved in the occurrence.

Rank	Nationality	Date joined ship	Service with company (Years)	In-Rank experience (Years)	Experience serving ¹¹ onboard sisters' ship
Master	PRC ¹²	24 May 24	1.25	3.5	i. Proteus Sinead. ii. Proteus Rong Na
CM	PRC	1 May 24	17.1	3.6	
2M	Filipino	21 Feb 24	0.5	9	
3M	Indian	1 May 24	4.7	1.2	i. Proteus Bohemia
CE	PRC	21 Mar 24	2.6	8	
2E	Indian	4 Mar 24	8.8	2.3	i. Proteus Sinead
PM	Indian	11 Jan 24	1.75	5.75	i. Proteus Bohemia
BSN	Indian	15 Oct 23	19	6.75	
ASD Gupta	Indian	8 Nov 23	2	1.5	
Wiper	Indian	11 Jan 24	4.9	1.5	
OSM (MOB)	Indian	21 Mar 24	0.5	8.1	i. Proteus Bohemia

Table 1

1.3 Training and drills conducted onboard

1.3.1 During the OSM's time onboard PH, the following training sessions and drills were conducted for all crew members.

a. Training

- i. 19 April 2024: Rescue boat launching.
- ii. 3 May 2024: Proper use of MOB lifebuoy.

b. Drill

- i. 3 May 2024: SAR operation, MOB and recovery of person from water.

¹¹ Single contract for senior officer – 3 months with one month optional, while junior officers and crew – 6 months.

¹² The People's Republic of China.

ii. 4 May 2024: Rescue boat launching.

1.4 Additional information

1.4.1 OSM

1.4.1.1 The OSM joined PH on 21 March 2024 for a four-month contract but had requested for an early sign-off which was approved by the Company. This request was reportedly due to the need of his attention at home to assist with personal matters.

1.4.1.2 It was reported that due to this early sign-off, the OSM had to bear part of the repatriation cost. Since PH's schedule was not confirmed, there was a need for the OSM to expediate the sign-off at anchorage, where his transport arrangement had been made.

1.4.2 New Master

1.4.2.1 It was reported that the new Master, once embarked onboard PH, requested for a bandage to be applied to a skin abrasion sustained on his left leg. The skin abrasion was due to the service boat heaving with the waves when he was transferring from the service boat onto the pilot ladder. The new Master then inquired why the combination ladder was not rigged on the lee side (port side). The OSM explained that there was not much difference on the port side as the wind was mostly from aft after dropping anchor on arrival. The main engine had been prepared for departure, however, neither of the two Masters consider heaving up the anchor and manoeuvring the vessel to provide a lee for the service boat nor did they instruct the crew to rig a combination ladder on the port side.

1.5 The ship

1.5.1 PH was an Aframax¹³ tanker fitted with seven cargo tanks specifically designed for the carriage of crude/ product oil. These tanks were constructed to minimise the risk of spillage and streamline cargo handling operations, ensuring safe and effective loading and unloading. PH's design complied with the environmental regulations, reducing emissions and enhancing fuel efficiency, making it a

¹³ Aframax tankers – typically have a deadweight tonnage (DWT) between 80,000 and 120,000 metric tons. Dimensions: generally, have a length of about 240 to 270 meters and a beam between 32 to 42 meters.

suitable choice for crude/ product oil transportation.

1.6 Safe transfer arrangement using combination ladder

1.6.1 PH's safe transfer of personnel using combination ladder complied with the following IMO regulations: MSC.1/Circ.1331 (Amendments to the Recommendation on Pilot Transfer Arrangements), MSC.308(88) (Adoption of amendments to the International Convention for the Safety of Life at Sea (SOLAS), 1974), and Resolution A.1045(27) (Pilot Transfer Arrangements adopted on 30 November 2011).

1.6.2 These regulations ensure that the equipment and procedures used for personnel transfers meet the necessary safety standards.

1.6.3 Transfer arrangements of vessels where the height from sea level to the point of access or egress exceeds 9m must use an accommodation ladder in conjunction with a pilot ladder, in compliance with Resolution MSC.308(88), adopted by SOLAS 74, as amended. PH was provided with the required equipment to facilitate safe transfers. See **figure 6** - Photographic evidence provided by PH indicating the condition of the equipment.



Figure 6 - Photographic evidence provided by the ship indicating that the ladders were in good working condition. *Source:* The Company.

¹⁴ Pilot ladder received by PH on 10 January 2024 and came with a type approved certificate issued by Lloyds Register.

- 1.7 The Company SMS
 - 1.7.1 The Company received a Document of Compliance (DOC) certificate from DNV on 30 June 2022, after completing the verification process on 30 June 2022. This certificate was valid until 31 August 2027.
 - 1.7.2 Following an external audit on 15 November 2022, PH was issued a Safety Management Certificate (SMC) by DNV, valid until 15 November 2027.
 - 1.7.3 PH possessed the necessary certificates for International Safety Management (ISM) Code and flag Administration compliance. Onboard documents included organisational policies, procedures, manuals and checklists, including industry publications.
 - 1.7.4 The SMS established a safety and environmental protection policy. The policy, among others, included the mandatory use of lifejackets, transferring baggage and backpack by rope, and implementing the Stop Work policy.
 - 1.7.5 The Company maintained onboard records, including maintenance logs for the accommodation ladder, pilot ladder, and rescue boat. Records of training drills, focusing on readiness and maintenance. These records ensured that all equipment were maintained and that the crew were trained for emergencies.
 - 1.7.6 In compliance with the ISM Code, the Company maintained a safety policy onboard. This policy required the crew to conduct risk assessments and toolbox meetings before starting daily tasks, especially new ones. The Company had defined the roles, responsibilities, authorities, and relationships of personnel involved in safety, ensuring all crew members understood their obligations in maintaining a safe work environment.
 - 1.7.7 SMS on Stop Work Card
 - 1.7.7.1 The Stop Work Card policy, as outlined in the Safety Management Manual¹⁵, empowered all employees to halt any work deemed unsafe, ensuring immediate attention to hazardous conditions. The policy mandated that the Master of the vessel to maintain a sufficient stock of Stop Work Cards, ensure every crew member possesses a card, and familiarise with the procedure.
 - 1.7.7.2 The primary conditions necessitating the use of the Stop Work Card included

¹⁵ BSM (Doc No: 39, Rev No: 203, Effective Date: 25-06-2024)

observing unsafe working conditions, unsafe acts, unethical work practices, MARPOL violations, non-compliance with procedures, absence of required permits, violations of the Shipboard Drug & Alcohol Policy, and any non-compliance with established rules and regulations. Employees were encouraged to exercise this authority without fear of negative repercussions, emphasising the Company's dedication to a safe working environment.

- 1.7.7.3 Upon identifying unsafe conditions, the immediate step was to stop work and resolve the concern with the involved parties. If necessary, the crew should contact their supervisor to ensure proper corrective actions were taken before resuming work. This included conducting a new toolbox meeting to address the identified hazards and confirm that safety measures are in place.
- 1.7.7.4 The policy required the Master or Safety Officer to report the incident to Company, documenting the use of the Stop Work Card and discussing the unsafe work during the next safety meeting. This follow-up ensured continuous improvement in safety practices and reinforced the importance of the Stop Work Card policy in maintaining a safe and compliant workplace.
- 1.7.8 SMS on Transfer of Person at anchorage manual¹⁶.
 - 1.7.8.1 The manual stated that accommodation ladder should be used for access to ship whenever possible. Proper setup of stanchions with tightly secured manropes or fixed handrails was mandatory to provide safe and stable access. A lifebuoy equipped with a self-igniting light and a buoyant lifeline must be readily available for immediate use in case of an emergency.
 - 1.7.8.2 The manual also stated that while using a pilot ladder to embark or disembark, personnel must wear a lifejacket, preferably an inflatable lifejacket, and only one person should be on the ladder at a time without carrying any handbag or backpack. Baggage should be transferred by rope to ensure safe handling.
 - 1.7.8.3 It was crucial not to use the pilot ladder if the person was unfit, lack confidence in its use, if the ladder is damaged, or if conditions were unsafe.

¹⁶ Safety Management Manual BSM (Article No: 1439/Rev No: 5/Effective Date: 13-09-2023/Approved by Director LPSQ)

1.7.9 Rescue boat

1.7.10 PH's rescue boat was fitted with a single-arm slewing davit for launching and recovery. The rescue boat came with a test certificate from a survey organisation¹⁷, which also met the customer requirements at the time of manufacture. The accompanying manual provided instructions on operation and maintenance. Designed to self-right, the rescue boat included essential safety equipment such as oars, a compass, a searchlight, and buoyant lifelines. It was capable of operating at 6 knots with a full load for at least 4H.

1.7.11 The manual further provided the launching and recovering mechanism of the davit which was designed to function effectively in moderate sea conditions. The davit system complied with SOLAS Convention, Life-Saving Appliance (LSA) Code, and relevant Maritime Safety Committee resolutions. It could deploy a fully loaded or empty rescue boat with the ship's trim up to 10° and a list up to 20°.

1.8 Record of medical examinations.

1.8.1 The extract from the relevant section of OSM's medical examination conducted on 29 February 2024 indicated the following conditions:

- a. High blood pressure
- b. Hypertension, currently managed with medication¹⁸.

1.8.2 The OSM had been assessed and declared fit for service at sea.

1.9 Cause of death

1.9.1 The OSM's death certificate was issued by 'Hankuk Forensic Medical Services'. The certificate indicated that the cause of death as 'Drowning' (Estimation).

¹⁷ China State Shipbuilding Cooperation.

¹⁸ The investigator could not ascertain whether the OSM had taken his daily medication dosage.

The medication was as follows:

- Tab Amlodipiner Besilate 5MG – This medication, usually taken daily to manage and control high blood pressure and prevent chest pain (angina) (Open source).
- Tab Atorvastatin 10MG – This medication, usually taken daily to lower cholesterol levels and reduce the risk of heart disease and stroke (Open source).

- 1.10 Location of anchorage
- 1.10.1 The B3-2 anchorage area was located approximately 4.5 nautical miles from the Korean coast. This location was characterised by its openness, making it vulnerable to various environmental factors such as weather, wind, sea currents, and tidal changes.
- 1.10.2 The exposure of the anchorage to these elements, along with the effects of high-speed passing vessels, significantly influences sea conditions. These conditions could affect the safety and stability of anchored vessels, particularly during personnel transfers. To ensure the safety of crew members and the stability of the vessel, careful monitoring and management of these factors were essential. (See **figures 7 and 8**).



Figure 7 - Chart illustrating the south-east coast of Korea. *Source:* The Company.

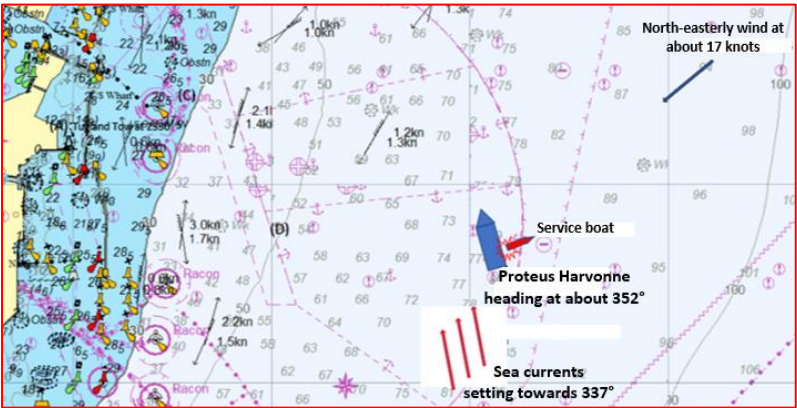


Figure 8 - Enlarged section of the chart illustrating the service boat approaching the ship at anchor and indicating the wind and sea currents at the time of the occurrence. *Source:* The Company. Annotation by TSIB.

2 ANALYSIS

The investigation looked into the following:

2.1 Cause of death

2.1.1 Without an autopsy being carried out, the exact cause of death of the OSM could not be determined, although the death certificate issued by 'Hankuk Forensic Medical Services' indicated that the cause of death was suspected to be drowning. Nevertheless, the investigation team endeavoured to analyse the circumstances leading to the fall of the OSM into the sea, with an aim to prevent future occurrence.

2.2 Cause of the MOB

2.2.1 The investigation team was presented with two scenarios on how the OSM fell into the water. One account from the crew of PH and service boat indicated that the OSM had fallen into the water after losing grip on the pilot ladder, the other account from the Company indicated that the OSM had fallen into the water when he lost balance after stepping onto the service boat. The investigation examined the two scenarios as follow.

2.2.2 Scenario 1: Loss of grip on the pilot ladder

2.2.2.1 In this scenario, which was from the crew of PH and service boat, it was suggested that the OSM lost his grip and footing on the pilot ladder while waiting for the service boat to move closer to a position suitable for a safe transfer. However, the investigation team was not able to solicit from the crew of PH and service boat the information about the distance between the service and the OSM when the incident occurred.

2.2.3 Scenario 2: Loss of balance after stepping onto the service boat

2.2.3.1 In this scenario, which was from the Company's report (based on P&I's investigation report), it was suggested that the OSM had placed a foot on the service boat, but the effect of the swell on the boat caused him to lose balance, resulting in his fall into the water.

2.2.4 Corroborating the information

2.2.4.1 Due to the rough sea conditions and sea swells impacting the pilot ladder, which was positioned close to the water level, it is possible that the swells destabilised the pilot ladder, causing the OSM to lose his grip and subsequent fall into the water.

2.2.4.2 With regard to scenario 2, as the Company could not provide evidence as to which crew had provided the information to the P&I investigators, the investigation team could not corroborate the P&I's investigation report. As mentioned, there was no information on the distance between the service boat and PH from both the crew of PH and service boat, it is unknown where the P&I investigator received information that the OSM had put one foot on the deck of the service boat and lost balance after releasing his grip from the pilot ladder.

2.2.4.3 Although the account from the crew of PH and service boat do not corroborate with the Company's in the aspect on how the OSM fell into the sea, both accounts indicated that the rough sea conditions had contributed to the event.

2.2.4.4 The investigation team identified that the exposed location of the anchorage and the prevailing weather and sea swells were factors that were not adequately assessed during the planning and execution of the personnel transfer. The occurrence has demonstrated the need for more cautious risk assessment and consideration of alternate safer methods for personnel transfers in challenging sea conditions. Examples included creating a temporary lee for relatively calm seas during the transfer operation, waiting for the sea swells to subside, arranging for crew changes to be done at berth, in a sheltered location, or at the next convenient port.

2.2.5 Position of the transfer

2.2.5.1 Despite being told by the new master of the difficulties faced when boarding PH from the windward side, the PH crew did not rig the pilot ladder on the lee side for the transfer of the OSM to the service boat. It would have been prudent to rig the pilot ladder on both sides of the ship, allowing the personnel transfer to take place on the calmer side.

2.3 Effectiveness of SMS implementation

- 2.3.1 The Company SMS requirements for the safe personnel transfers included the use of personal protective equipment (PPE) such as lifejackets, and backpacks were to be transferred separately. The OSM did not wear a lifejacket and was carrying his backpack when he was disembarking.
- 2.3.2 The Company's Stop Work Card provided a mechanism for crew members to halt operations if unsafe actions were observed. Although the OSM declined the CM's request to remove his backpack and wear a lifejacket, the CM did not exercise the Stop Work Card, as empowered by the Company, to ensure a safer transfer.
- 2.3.3 The lack of adherence to SMS by senior management raised a concerning precedent for setting the correct safety culture onboard the ship. This incident underscores the importance of adhering to Company's established procedures by all the crew, regardless of their ranks, as well as ensuring that established procedures are effectively implemented on board the ship by the Company.

2.4 Response to man overboard (MOB) event

- 2.4.1 The crew responded promptly to the MOB incident. Despite the challenging sea conditions, which rendered the rescue attempt unsuccessful, their efforts were commendable. The rescue boat was reported to be operational and met the necessary technical requirements and standards for performing its intended functions during the incident, indicating that equipment issues did not impede the response. Nevertheless, the challenging sea conditions had impeded the crew's rescue efforts.
- 2.4.2 It is noted that boat handling drills are typically conducted in calm sea and weather conditions. Crew must be aware that in an actual rescue operation, the weather conditions could be far more challenging. Therefore, enhancing the crew's familiarity and knowledge of operating rescue boat in adverse conditions through video and simulation training could help to improve their preparedness and raised their awareness.

3 CONCLUSIONS

From the information gathered, the following findings are made. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

- 3.1 The exact cause of death could not be confirmed without an autopsy being conducted on the OSM, however, the death certificate from 'Hankuk Forensic Medical Services, suspected drowning as the cause.
- 3.2 Two possible scenarios were presented to the investigation team on how the OSM fell into the sea:
 - a) The OSM had lost his grip and footing on the pilot ladder while waiting for the service boat to come into position. However, the crew of PH and service boat was not able to provide information on the distance between PH and service boat.
 - a) The OSM had stepped onto the service boat but lost his balance due to sea swells, leading to his fall. However, the Company was not able to provide information on the source of this account.
- 3.3 Although it was not possible to ascertain which scenario occurred, both accounts mentioned that the rough sea conditions had contributed to the fall of the OSM.
- 3.4 It was deemed that the rough weather conditions were not properly assessed during the planning of transfer. A more thorough risk assessment should have been conducted given the challenging sea conditions. Safer alternatives, such as waiting for calmer seas or transferring to be done in a sheltered area, should have been considered.
- 3.5 Although the new master indicated that during his boarding from the windward side was difficult, no instruction was given to the crew to conduct the disembarkation of the OSM on the lee side.
- 3.6 The Company SMS required that personnel performing transfer to wear lifejacket and backpack was to be transferred separately using rope, the OSM did not wear a lifejacket and carried a backpack during the transfer to the service boat. The Company SMS empowered crew to use Stop Work Card when an unsafe act was performed, the CM did not use the Stop Work Card

when the OSM refused to remove his backpack and wear a lifejacket. The occurrence demonstrated that the Company SMS was not effectively implemented onboard PH.

- 3.7 The PH crew responded quickly to the MOB incident, and although the rescue boat was operational, the rough sea conditions had hindered the rescue efforts and made it difficult for them to reach to the OSM in the water, despite their best efforts.

4 SAFETY ACTIONS

Arising from discussions with the investigation team, the Company (Bernhard Schulte Shipmanagement Singapore Pte. Ltd) had taken the following safety actions.

- 4.1 Conducted fleet-wide safety meetings to discuss safe access procedures, safe behaviours, and the proper use of PPE.
- 4.2 A Group Safety Alert about the incident was issued to all vessels to raise awareness of safety procedures.
- 4.3 A Learning From Incident (LFI) exercise was carried out across all vessels, using this incident as a learning point.
- 4.4 The Company's Safe Access Procedure was updated to include the requirement to provide lee to the transfer boat during ladder transfers and to display safety signs to remind personnel disembarking the ship to wear a lifejacket and not to carry a backpack.
- 4.5 An onboard training session was conducted to reinforce the use of 'Stop Work' authority and safe access procedures.
- 4.6 An enhanced risk assessment has been developed for personnel transfers at anchorage, taking into consideration factors such as selecting a safer anchorage and postponing personnel transfers in the event of adverse weather conditions. These assessments evaluate both the current and forecasted weather conditions, with particular focus on factors such as wind speed, swell height, and sea state, which could significantly impact the safety of the transfer operation.
- 4.7 New signage has been prominently displayed at transfer areas. Compliance is now being monitored through Superintendent inspections and internal audits. The requirement for PPE is a key compliance point on the checklist. As per the Company SMS, the Marine Superintendent is responsible for ensuring adherence to this checklist.
- 4.8 Introduced a declaration form¹⁹ in its SMS procedures for personnel transfer, requiring the Master to brief the service boat captain and obtain an

¹⁹ Declaration by Boat Operator (For Personnel Transfer).

acknowledgement. Among other things, the form requires the service boat captain to declare that the boat be equipped with handholds, lifejackets, communication devices and survivor recovery arrangements. Personnel are also required to wear a lifejacket and are prohibited from carrying backpacks or bags during transfers between the ship and service boat.

5 SAFETY RECOMMENDATIONS

In view of the safety actions taken by the Company, no safety recommendation has been issued.