

Final Report

FATALITY OF CREW AFTER FALLING OVERBOARD FROM EPIC BORACAY IN SOUTH ATLANTIC OCEAN, OFF BRAZIL 10 JUNE 2021

TIB/MAI/CAS.113

Transport Safety Investigation Bureau
Ministry of Transport
Singapore

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The Transport Safety Investigation Bureau of Singapore

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SYNOPSIS

On 10 June 2021, the Singapore registered gas carrier, MT Epic Boracay (EB), was transiting in the South Atlantic Ocean, bound for a Brazilian port. At about 0800H (local time), after handing over the navigational watch to the Third Officer (3O), the Chief Officer (CO) tasked two able-seafarer deck (ASD) to carry out painting work for the undersides of two separate stairway landings from the boat-deck.

After the ASDs collected the required tools, they began the painting work using telescopic rods connected to roller-brushes. About an hour into the painting work, one of the ASDs (ASD-1) saw the other ASD (ASD-3) carrying a portable A-frame ladder to the boat-deck. Shortly after, the ASD-3 was seen sitting on top of the ladder carrying out the painting and then losing his balance when the ladder tilted, while EB was altering course. The ASD-3 and the ladder went overboard.

A man-overboard procedure was carried out and with the assistance of a nearby fishing vessel, the motionless body of ASD-3 was recovered on board. Attempts to resuscitate the ASD-3 were unsuccessful.

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

The investigation revealed that the use of the portable ladder was not considered necessary for the painting work, when the ASDs were assigned and briefed for the work in the Bridge. The use of the portable ladder, as stated in the Safety Management System (SMS), required a risk assessment and a permit-to-work to be carried out and also to be approved by the Master. The ASD-3 had used the portable ladder without consulting anyone. Although provided with a stop-work authority card, the ASD-1 did not execute this authority, missing the opportunity to stop the ASD-3 from using the portable ladder.

The investigation also revealed that there was a difference in the understanding of the SMS requirement for the type of work activities to be entered in the “Change of Bridge Watch” checklist by the watchkeeping officers (the CO and 3O), resulting in the 3O not being aware of the painting work on the open-deck.

VIEW OF VESSEL



DETAILS OF VESSEL

Name	EPIC BORACAY
IMO Number	9521588
International Call Sign	9V7141
Flag Registry	Singapore
Classification society/ ISM¹ Recognised Organisation	AMERICAN BUREAU OF SHIPPING (ABS)
Ship type	Gas Carrier, IGC Type 2PG
Year Built	2008
Owner/ Company²	EPIC BORACAY PTE. LTD. / BW EPIC KOSAN MARITIME PTE. LTD.
Gross tonnage	5836
Length overall	119.29m
Breadth	18.2m
Draught	2.65m (Forward) / 4.20m (Aft)
Height of boat deck to waterline	Approx. 18.30m
Main engine(s)	HITACHI ZOSEN MAN B&W - 7L35MC

¹ In accordance with ISM Code – SOLAS Chapter IX, IMO Res.A.741(18) as amended thereof.

² Responsible for the safe management of the ship under the ISM Code.

1 FACTUAL INFORMATION³

All times used in this report are Brazil's Brasilia BRT Local Time (LT) unless otherwise stated. Brasilia BRT Local Time is three hours behind of Coordinated Universal Time (UTC).

1.1 Sequence of events

- 1.1.1 MT Epic Boracay (EB)⁴ departed Belem Port, Brazil, in ballast condition on 6 June 2021 and was bound for Suape Port, Brazil, to load cargo. EB was expected to arrive the loading port on the evening of 10 June 2021.
- 1.1.2 At about 0730H on 10 June 2021, an able-seafarer deck (ASD-1) came on the Bridge for general cleaning as part of his daily work routine. The Chief Officer (CO) was the Officer-in-charge of the navigation watch (OOW). At this time EB was being navigated on auto-pilot on a heading of 166°(T) and doing a speed of about 12.5 knots (kts) with the engine telegraph at full-ahead.
- 1.1.3 The Third Officer (3O) came to the Bridge at about 0753H to take over the navigational watch from the CO. At about 0757H, another able-seafarer deck (ASD-3⁵) came to the Bridge⁶ to receive the job orders⁷ for the day from the CO. At around 0805H, the 3O took over the navigational watch from the CO and was thereafter the OOW.
- 1.1.4 According to the CO, while he was still on the Bridge between 0805H and 0810H, both the ASD-1 and ASD-3 were briefed⁸ by him to paint the underside of the external stairway landings⁹ at the bridge-deck level (see **figure 1**) from the boat-deck, using telescopic rods (see **figure 2**) connected to a roller brush. Thereafter, the CO went to his cabin for rest and the two ASDs went on deck.

³ Gathered through interviewing of the relevant crew members and information provided by Company such as photographs of incident location and SMS requirements.

⁴ EB was on time charter for inland and coastal voyages in Brazil since July 2020 carrying LPG, Butane or Propane cargoes.

⁵ The ASD-3 was the rostered ASD on Bridge watchkeeping duty. See 1.3.

⁶ Refer to 1.3.1 for more information on Bridge team and navigation watch levels.

⁷ Typical routine on most ships is for the CO to assign job orders to a representative of the deck crew, usually the Bosun. There were four deck crew (three ASDs and one ordinary seaman) on board EB. The deck department was under the direct supervision of the CO. As such one of the deck crew was assigned to take the job orders from the CO on daily basis.

⁸ The Bridge audio recordings from the VDR did not capture this event.

⁹ There are two external stairways leading from the boat-deck to the bridge-deck on both the port and starboard sides, facing aft of the ship. The stairway landings to be painted are at the same level as the bridge-deck.

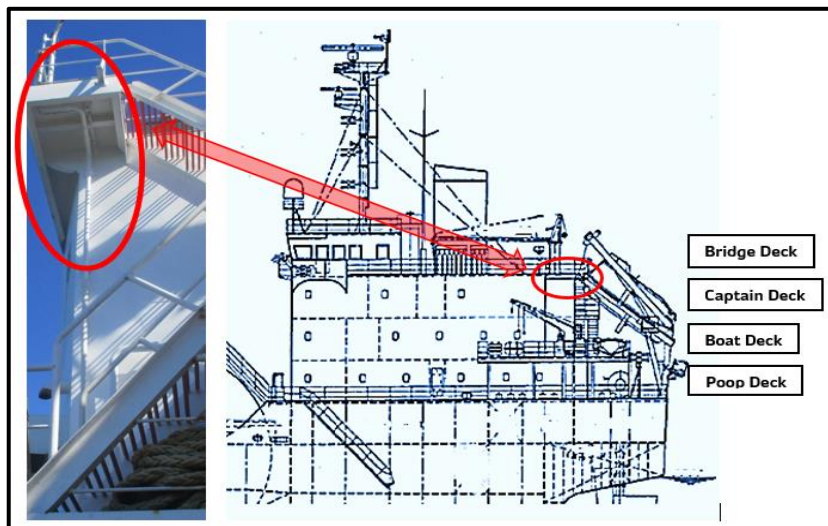


Figure 1: General Arrangement of EB indicating the deck layout and the external stairway landing which the ASD-3 was assigned to paint (circled in red) – not to scale. (annotated by TSIB)

Source: Company of EB.

- 1.1.5 After collecting the paint, roller brushes and telescopic rods from the deck store¹⁰, both the ASDs commenced the painting work at the boat-deck (the ASD-1 was painting the starboard side's stairway landing, closer to the centreline and near the free-fall lifeboat, while the ASD-3 was painting the one on the port side).



Figure 2: One of the telescopic rods used for the painting job by the ASDs. The rod was about 5m in length when fully extended.

Source: Company of EB.

- 1.1.6 At About 0925H, while the ASD-1 was in the midst of the painting job, he recalled seeing the ASD-3 coming up from the poop-deck via the starboard side, carrying a portable A-frame ladder and going to the port side. The ASD-1 did not query the ASD-3 but when he turned his attention towards the port side, he saw the ASD-3 sitting on top of the ladder and painting the stairway landing (see **figure 3**).

¹⁰ The deck store is located at the bow of EB, below the starboard side of the forecastle deck.



Figure 3: (Left image) Enactment of ASD-3's position when seen from the stern. (Right image) – Plan view from the Bridge wing, of the approximate position (yellow-dotted circle) of the ladder.

(annotated by TSIB)

- 1.1.7 At about 0926H, according to the passage plan, the 3O commenced a starboard alteration of EB's heading to about 187°(T) using the auto-pilot. While turning, EB began rolling with the swell (see section 1.6).
- 1.1.8 Around the same time, the ASD-1 recalled seeing the ladder tilt towards the sea with the ASD-3 holding on to the drainpipe under the stairway landing, with one hand (see **figure 4a**) to balance the ladder and himself. In quick succession, as a result of a successive roll, the ladder tilted again and this time, both the ASD-3 and the ladder went overboard (see **figure 4b**).



Figure 4a: Enactment of ASD-3's position at the time of the first roll.

Source: Company of EB



Figure 4b: Approximate angle when the ladder tilted towards the sea – view from forward, towards the stern.

(**Note:** Rope was included only for the purpose of enactment).

Source: Company of EB.

- 1.1.9 Seeing the ASD-3 and ladder falling overboard, the ASD-1 ran to the port side and threw the nearest lifebuoy towards the ASD-3 in the water, who was drifting away as EB continued to steam ahead. The ASD-1 then ran down to the crew mess at the (portside) poop-deck while continuously shouting “*Água! Águ!*” (sic)¹¹.
- 1.1.10 The ASD-1 saw the Chief Engineer (CE), who was in the crew mess, and pulled him out to the open-deck on the port side and communicated using hand gestures that someone had fallen overboard. The CE ran back to the crew mess and called the Master’s cabin via the telephone.

¹¹ Presumed to mean ‘water’ in Brazilian Portuguese language.

- 1.1.11 Meanwhile, the ASD-1 ran up to the Bridge (via the external stairway) and informed the 3O about the man overboard (MOB) incident. At about 0938H, the Master and the CE came up to the Bridge with some other crew members. The 3O made an announcement on the public address (PA) system for the crew to muster for the MOB situation. The Master subsequently took over the conn of EB from the 3O and got the ASD-2 (who had come to the Bridge according to his duties in a MOB situation) to change from auto-pilot to manual steering.
- 1.1.12 At about 0939H, the Master commenced a hard-over port turn, with the 3O marking the MOB position on the ECDIS¹², while concurrently making several broadcasts on the VHF to nearby vessels, as well as to the Cabedelo port control, which was the nearest port. By this time all remaining crew of EB had mustered and headcount was taken in accordance with established procedures. The CE with four other crew members assisted as lookouts (using the binoculars) from the Bridge and the Bridge wings to locate the ASD-3. The CO separately gathered the ASD-1, Third Engineer and Fourth Engineer to prepare the rescue boat at the boat-deck, while the Nurse¹³ prepared the first aid bag and the stretcher.
- 1.1.13 By about 0950H, the lookouts located the ASD-3 in the water. As EB manoeuvred closer, the ASD-3 was noted to be floating motionlessly facing up. Some of the crew members shouted to attract the attention of the ASD-3 and threw two lifebuoys towards the ASD-3 when EB was about 5-10m away but there was no response from the ASD-3. The 3O communicated with a fishing vessel in the vicinity, which came closer and managed to pull the ASD-3 on to the fishing boat at about 0957H. The skipper of the fishing boat informed EB that the ASD-3 had no pulse and was unresponsive.
- 1.1.14 The CO with some crew members then prepared the ship's crane for the transfer of the ASD-3. At about 1010H, with a cargo net and a wooden pallet, the ASD-3 was transferred from the fishing boat to EB. The Nurse's attempts to resuscitate the ASD-3 were unsuccessful and at about 1110H it was confirmed that the ASD-3 had lost his vital signs.
- 1.1.15 The Master was instructed by the port control to divert EB to berth at the Recife port, as Cabedelo port did not have facilities to handle deceased persons. The body of ASD-3 was subsequently transferred ashore on 11 June 2021, after a

¹² Electronic Chart Display Information System.

¹³ According to the Company, a qualified Nurse was engaged on board as required for vessel(s) under cabotage in Brazilian waters.

local police investigation.

1.1.16 EB then departed Recife port on 15 June 2021 and continued its voyage to Suape, after being released by the local authorities. The death certificate for the ASD-3, issued by the Brazilian authority dated 25 June 2021, stated the cause of death as asphyxiation due to drowning, with minor bruises and abrasions on the inner thighs.

1.2 Crew Experience, work schedule and rest hours

1.2.1 At the time of the incident, EB's manning comprised 17 officers and ratings and one nurse. Among the 18, five were Brazilians while the rest were Filipinos. The official and working language on board was English. The crew experience matrix of those involved is shown in the table.

Designation	Master	Chief Officer	Third Officer
Qualification	Master Mariner STCW II/2 Issued Feb 2017	Master Mariner STCW II/2 Revalidated Mar 2020	Master STCW II/2 Issued Sep 2016
Certification Authority	Philippines	Philippines	Brazil
Nationality	Filipino	Filipino	Brazilian
Age	38	44	39
Experience in Rank	5.6 months	8 years	2.9 years
Period with Company	(as Master) 5.6 months	(as Chief Officer) 2 years	4.75 months
Period on board	7 days	4 months	1.8 months
Duty Schedule	N/A	0400 – 0800 1600 - 2000	0800 – 1200 2000 - 0000

Designation	ASD-1	ASD-3
Qualification	STCW II/5 Revalidated Jan 2017	STCW II/5 Issued Jun 2019
Certification Authority	Brazil	Philippines
Nationality	Brazilian	Filipino
Age & Height¹⁴	47 / 1.70m	33 / 1.70m
Experience in Rank	5.2 years	4.75 years
Period with Company	3.75 months	2 years
Period on board	1.5 months	1.5 months
Duty Schedule	Day Worker	0800-1200 2000-0000

1.2.2 In the 24-hour period prior to the incident, the ASD-3 had 13.5 hours of rest and in the last 7-day period, the ASD-3 had 96 hours of rest; both indicative of compliance with MLC¹⁵/ STCW's¹⁶ hours of rest and work requirements, as documented and gathered by the investigation team.

1.3 SMS requirements and additional information from the Company

1.3.1 In accordance with the Company's requirements on "Bridge team and navigation watch levels" for watchkeeping, for a "Watchkeeping Level-1¹⁷" condition, a navigation officer together with a qualified watchkeeping rating are required to be present on the Bridge. However, in fair weather, during daylight hours, the rating could also be given other work, provided that the OOW is aware of the work location and the rating is readily available on call. The ASD-3 was the rating assigned for the watchkeeping duty together with the 3O on the day of the incident. According to the 3O he was aware of the Company's SMS requirements¹⁸. He further added that he was not aware what tasks were assigned to the ASD-3 on the day.

¹⁴ Information taken from the medical records and seafarer's record book separately.

¹⁵ Maritime Labour Convention.

¹⁶ International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978.

¹⁷ Normal open sea or coastal navigation with fair weather condition.

¹⁸ According to the SMS, the watchkeeping rating was supposed to carry a walkie-talkie to maintain communications with the OOW.

1.3.2 According to the Company, pre-boarding induction programs undertaken by the Company's training department, were conducted remotely as per Company's training requirements, regardless of the nationality of the crew. The scope includes:

- IMS¹⁹ policies and safety practices related to compliance with Company's policies;
- Latest SHEQ²⁰ Alerts;
- Safe bunkering practices; and
- Safety program familiarisation.

On-signers would also be briefed as a part of shipboard safety familiarisation and a review was to be carried out during training and drills.

1.3.3 Use of portable ladders

1.3.3.1 The SMS stated that a staging or ladder must be utilised when work is to be done beyond normal reach.

1.3.3.2 According to the Company, the work assigned by the CO for the two ASDs did not require the use of any portable ladders or rigging of staging or the Bosun's chair, as the telescopic rods could be extended to a maximum of 5m, sufficient to reach the area to be painted while standing on the boat-deck.

1.3.3.3 Two portable A-frame ladders were stowed in the deck store and the use of the ladders, as per Company's SMS, falls under the purview of working at height (aloft)²¹ and has to be permitted only after the conduct of a risk assessment (RA), before issuing a permit to work (PTW) with the approval of the Master.

1.3.3.4 The SMS also stated that –

¹⁹ Integrated Management System – combining other different statutory standards into a common system that meets the requirements of each of the standards.

²⁰ Safety, Health, Environment and Quality management for the workplace that applies several disciplines of the ISO requirements.

²¹ According to the SMS anyone working and not standing on level ground or at deck level is deemed to be working at height. Also undertaking work inside a tank, near an opening such as a hatch or on a fixed stairway maybe regarded as working at height if there is a danger of injury if the person fell.

- Personnel working aloft should wear a safety harness with lifeline or other arresting device at all times. A safety net should be rigged where necessary. When working over-side, in addition, a life vest must be worn & lifebuoy with sufficient line kept ready for immediate use. A person on deck shall be positioned to observe and assist whenever work is being carried out aloft or over-side.

1.3.3.5 Before this incident, both the ASD-1 and ASD-3 were involved in other de-rusting and painting work that made use of these portable A-frame ladders, i.e. out of normal reach. Records obtained by the investigation team indicated that RAs and related PTWs were carried out and documented respectively for those occasions.

1.3.4 Awareness of crew working on open-deck

1.3.4.1 The Company’s SMS requires the watchkeeping officers to understand certain directives at the time of taking over the navigational watch in order to perform the work safely. The directives include special work being carried out on deck or in the engine room as well as the safety instructions. This understanding is required to be recorded in a “Change of Bridge Watch” checklist (see **figure 5**).

Change of Bridge Watch Underway							
<i>To be completed by the Relieving Watch Officer and verified, at least daily by the Master.</i>							
	Enter Y=yes N=No						
ITEM	00-04	04-08	08-12	12-16	16-20	20-24	00-04
Relieving Officer has read and understood the following directives:-	enter date						enter date
- Master's Bridge Standing and Daily Orders							
- Navigational Passage Plan							
- Navigational Warnings							
Specific reporting requirements for local VTS							
-Any Pilot instructions / Deck / Engine special work / safety instructions							
Relieving Officer is satisfied the relieving watch are capable of carrying out their duties.							

Figure 5: Extract of the “Change of Bridge Watch” checklist to make sure that the taking-over navigation officer understood and satisfied with the directives.

Source: Company of EB

1.3.4.2 The checklist for the incident day sighted by the investigation team did not indicate any entry when the 3O took over the watch. The investigation team also noted that there were no provisions in the checklist to provide description(s) on the type of work to be documented.

1.3.5 MOB procedures

1.3.5.1 As per the SMS, under the Company's Emergency Procedures Manual in the event of a MOB, the immediate actions include (but not limited to) –

- releasing the MOB marker buoy²² to the side of the MOB;
- engaging hand steering and putting the helm (wheel) on hard-over to the side of the MOB;
- sounding the ship's whistle (horn) with three prolonged blasts and raising the 'Oscar' flag;
- raising the emergency alarm, broadcasting the MOB and mustering the crew;
- marking the MOB position on the GPS/ ECDIS; and
- posting additional lookouts and preparing the rescue boat for launching.

1.3.5.2 The investigation team gathered from the Master and the 3O that the MOB marker buoy was not released, the ship's horn was not sounded, and the 'Oscar' flag was not raised.

1.3.6 Stop-Work authority

1.3.6.1 As per the SMS, a stop work authorisation process was in-place on board the fleet managed by the Company with the objective of preventing injuries or accidents when any ship's staff observe an unsafe act, situation, or condition.

1.3.6.2 All personnel on board who had gone through the safety induction both ashore and when joining the ship, would be provided with a "STOP" card and a whistle, bound by a (neck) lanyard (see **figure 6**).

²² A buoyant equipment that has self-igniting light and a self-activating (orange) smoke signal tied with a lifebuoy.



Figure 6: Provided to all ship's staff on board the fleet of the Company, a lanyard with a whistle, a "STOP" card and a "Take 5" card.

Source: Company of EB.

1.3.6.3 From the Company's process for "Behaviour Based Process" as part of the SMS, any ship staff who observes a person committing an unsafe act or exposed to an unsafe condition is required to blow the whistle and flash the "STOP" card to stop the work. The work would resume only after all issues and concerns necessitating for the stop work have been adequately addressed. The initiator is also required to record the event in the Company's "Near Miss Reporting Form" for the ship and Company's perusal.

1.3.6.4 At the time of the incident the ASD-1 had the STOP card and the whistle on his neck but did not use them. When asked, the ASD-1 acknowledged that he understood the purpose of and how to use the "STOP" card according to the Company's SMS, i.e., when an unsafe practice is witnessed. On being queried further, the ASD-1 added that the time between him realising that the ASD-3 was on top of the ladder and the incident taking place was very short.

1.4 Code of safe working practice (COSWP)²³

1.4.1 A copy of the COSWP was carried on board EB and was referenced in the Company's SMS. In the sections that cited the use of portable ladders, the COSWP stated the following -

- Working from ladders should be avoided as far as possible but, where necessary, personnel must use a safety harness with a lifeline secured above the work position, where practicable.

²³ The COSWP published by the UK Maritime and Coastguard Agency (MCA) provides best practice guidance for improving health and safety on board ships. EB carries the COSWP on board.

- A portable ladder should only be used where no safer means of access is reasonably practicable.

1.5 Additional Information

- 1.5.1 The investigation team sought clarification from the Master on whether he was aware of the painting work. The Master confirmed that he became aware of the work after the incident but clarified that any work on open-deck has to be recorded in the “Change of Bridge Watch” checklist according to the SMS. The Master was unsure whether the OOW (the 3O) was involved in the toolbox meeting for the painting work conducted by the CO to the two ASDs.
- 1.5.2 According to the CO, EB was his fourth ship with the Company and second for the Brazil charter. It was his first time to serve on board with the ASD-1 and the ASD-3. He recalled briefing both the ASDs about the painting task on the Bridge after handing over the OOW duty to the 3O but did not record it in the “Change of Bridge Watch” checklist. The CO added that the recording in the checklist would usually be done when a PTW is required and that the Master would be briefed before requiring the Master’s signature and approval.
- 1.5.3 The CO confirmed that while instructing both the ASDs to use only the telescopic rods for the painting job from the boat deck, he did not mention about the use of any ladder, as its use would require a PTW, and the painting job was achievable without the ladder. The CO added that the ASD-1 had previously shown difficulties in understanding his instructions in the English language²⁴ most of the time and for this painting job, he had to show the ASD-1 photographs of where to paint.
- 1.5.4 The CO added that the ASD-1 was able to carry out all the required work (berthing, deck maintenance and repairs, etc.) and during the preparation of the rescue boat and midship crane for the recovery of the ASD-3’s body.
- 1.5.5 The 3O confirmed that he was unaware of any deck work for that day. He only became aware when the ASD-1 came on Bridge to inform him of the MOB. The 3O stated that for the past seven weeks since he was on board EB, he would usually be informed by the CO and/or the engineers for any significant work that may require his attention during his duty periods with regard to navigation or while at anchor.

²⁴ The CO felt that due to language barrier, the ASD-1 may not have stopped the ASD-3 from using the ladder.

- 1.5.6 The 3O confirmed that in fair weather and open sea, it was normal practice on board EB for the OOW to be alone on the Bridge for navigation watchkeeping during the day, while in contact with the watchkeeping ASD. The 3O also recalled seeing PTWs being issued in the past when the A-frame ladders were used by the ship's crew.
- 1.5.7 The ASD-1 stated that he knew the use of the A-frame ladder is prohibited unless a PTW is issued, where persons are also required to don safety harness and the ladder has to be secured to a strong point. The ASD-1 recounted that when the ASD-3 briefly walked past him on the starboard side, carrying the ladder, he did not suspect that the ASD-3 would be using it for the painting task as the ASD-1 himself did not find it difficult²⁵ to paint using the telescopic rod.
- 1.5.8 On being asked whether he had a walkie talkie with him to call the Bridge, the ASD-1 could not recall, but reiterated his actions of throwing the nearest lifebuoy to the ASD-3 before running down to the crew mess, as there would likely be some crew members during the daytime.
- 1.5.9 From the recount of ASD-1, the ladder was placed such that its legs (i.e. steps) were perpendicular to the fore-aft centreline of EB. **Figure 7** shows the positions of ASD-1 and ASD-3 and **figure 8** shows the height of the ladder when fully extended and the approximate distance of the ladder from the safety railings.

²⁵ The height of the platform (to be painted) from the boat deck was about 4.1m. The maximum length of the telescopic rod was about 5m. ASD-1's height is about the same as that of ASD-3.



Figure 7: Viewed from the stern, depiction of the erected A-frame ladder's position (yellow arrow) on the portside of the boat-deck. Red arrow points to the drainage pipe. ASD-1's (circled in red) back was facing the ASD-3.

Source: Company of EB.

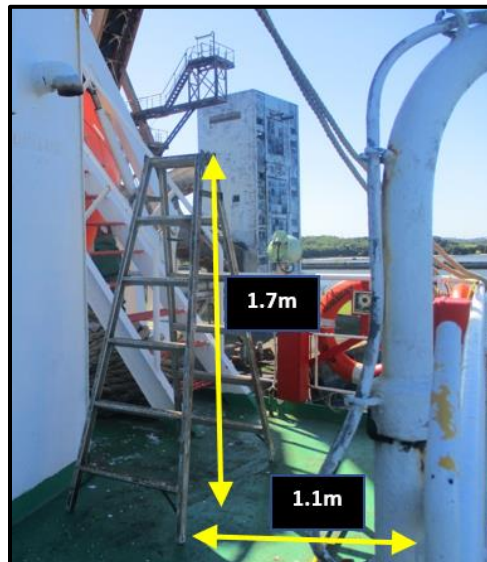


Figure 8: Height of the ladder and approximate distance of the ladder to the safety railings.

Source: Company of EB.

1.6 Environmental information

- 1.6.1 The location of the incident was about 14Nm²⁶ to the eastern coast of Brazil, in the South Atlantic Ocean. The wind was recorded as Force 4-5 on the Beaufort scale from 150°. Swell height was recorded to be between 1.0m and 1.5m and the interviewed crew members cited experiencing gentle rolling due to the long swells during the south-easterly transit to Suape port.

²⁶ Nautical mile. 1Nm = 1852m.

2 ANALYSIS

2.1 The Occurrence

- 2.1.1 The two ASDs were carrying out the painting work for about an hour prior to the ASD-3 being seen carrying a portable A-frame ladder and subsequently sitting on it, before losing balance and falling overboard together with the ladder.
- 2.1.2 Reasons for the ASD-3 to use this ladder could not be established, however the investigation team attempted to analyse the probable advantage that may have been considered by the ASD-3.
- 2.1.3 It was established that the ASD-3 had used the portable A-frame ladder in the past for work. By sitting on the portable ladder (which was 1.7m high), it reduced the upward reach to the underside of the stairway landing (which is at a height of about 5.1m from the boat-deck) to about 2.5m (i.e. minus the height of the ladder 1.7m and about half the physical height of ASD-3 when seated on the ladder, i.e. 0.85m) as compared to 3.5m by standing on the boat-deck and reaching upwards with a telescopic rod (see **figure 9**).
- 2.1.4 The investigation team opined that the ASD-3 may have considered the painting work to be less strenuous sitting on the portable ladder as it reduced the reach to the underside of the stairway landing.

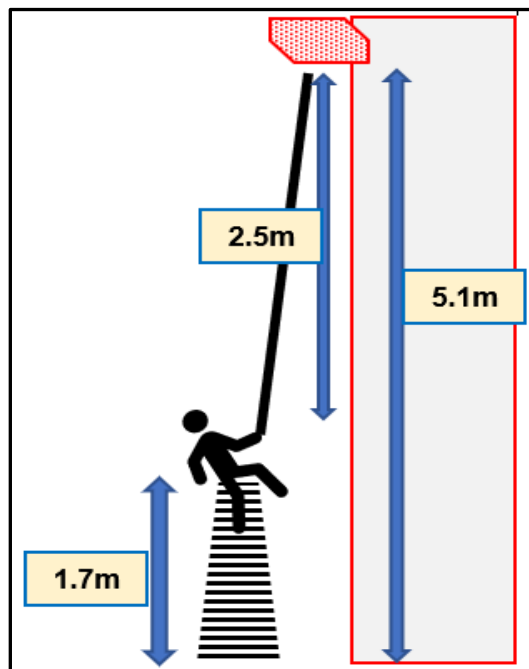


Figure 9: Illustrating the reach in metres to the underside of the stairway landing when seated on top of the portable A-frame ladder by a person of the same height as the ASD-3.

- 2.1.5 The ASD-3 had likely not considered the potential of the ladder to sway sideways while the vessel was underway and the consequent risk of falling overboard, given the proximity of the ladder's position to the safety railings.
- 2.1.6 The OOW was neither aware of any special deck work (painting work being carried) nor aware of an A-frame ladder being used by the deck crew. In addition, the OOW did not know the whereabouts of the watchkeeping rating, i.e. the ASD-3. When the OOW altered EB's heading from 166°(T) to 187°(T), it had likely created an outboard inertia which caused the unsecured ladder and the ASD-3, who was seated on it and not wearing a safety harness or lifeline or fall arrestor, to fall overboard into the sea.
- 2.2 The use of portable ladder
- 2.2.1 The SMS stated that the portable ladder can be used whenever work to be carried out is beyond normal reach, with preconditions that PPEs are to be donned. The Company referenced the COSWP to implement control measures for the safe use of the ladder by requiring the use of RA and PTW. Both the ASDs involved were likely familiar with these requirements.
- 2.2.2 Although the CO did not explicitly prohibit the use of a portable ladder when assigning the job, it was highly likely that the ASD-3's own plan had been thought of only when he was on-site, without the awareness of the CO. Notwithstanding the prohibition on the use of the ladder without a PTW, proper PPE required by the SMS (as stated in 1.3.3.4) could have afforded the ASD-3 some protection from falling overboard which were not used.
- 2.2.3 The investigation team thus held the view that, had there been a toolbox meeting conducted on-site, the reach to the underside of the stairway landing and the constraints in performing the job with a telescopic rod experienced by the ASD-3 could have been communicated to the CO and the consideration to use the portable ladder could have been assessed.
- 2.2.4 The investigation team also opined that upon commencement of the task, if the ASD-3 was not comfortable or had felt the method to be exhausted with using the telescopic rod from deck, it would have been desirable for the ASD-3 to consult the CO before using the portable ladder or bring his concerns to the OOW. Accordingly, the task could have been reassessed and an RA and the PTW process initiated, for the portable ladder to be used.

2.3 SMS guidance for crew working on open-deck when underway

- 2.3.1 The incident occurred at the open-deck behind the accommodation. The 3O, who was the OOW during the occurrence, indicated that he was not involved in the toolbox briefing conducted by the CO to the two ASDs, after he had taken over the navigational watch from the CO. The 3O also said that he was not aware of the location of both the ASDs and any work that was instructed to them.
- 2.3.2 The investigation team noted that the understanding of the CO and the 3O regarding the “Change of Bridge Watch” checklist was different from the expectations of the SMS (see paragraph 1.3.4.1) and the Master, both of which were aligned. Both the CO and the 3O regarded that, only work activities involving PTWs were required to be recorded in the checklist and subsequently having the Master being made aware of, with approvals.
- 2.3.3 The investigation team also noted that the SMS was unclear on the need to indicate the type of work activities to be recorded in the “Change of Bridge Watch” checklist. In addition, although there is a field to check-off with a “Y” (Yes) or “N” (No), for deck work, engine special work or safety instructions; there were no specific instructions on the need to provide description for the type of work activities which could be affected during the safe navigation of the ship.
- 2.3.4 It was also observed that the entries for the “Change of Bridge Watch” checklist required the choice of “Yes” or “No”. Without giving clear instruction on the use of the checklist, these two entries can be interpreted differently, for instance –
- If a “Y” is entered, the OOW is aware of the “safety instructions” relating to any special work and ALL other work; or
 - If an “N” is entered, the OOW is not aware of the any “safety instructions” relating to deck and “safety instructions” relating to any special work and ALL other work; or
 - the OOW has not understood any of the directives, so indicated.
- 2.3.5 While it is recognised that a diligently completed “Change of Bridge Watch” checklist may not have prevented the MOB from happening, having specific activities documented would have increased the 3O’s awareness that painting work was being carried out at the open-deck, and in anticipation of a change in the vessel’s navigation condition or encountering adverse weather conditions,

such work activities could be monitored, and the crew be advised accordingly.

- 2.3.6 It is also recognised that there is a need to require the means of communications with the crew performing the work activities to be indicated in the “Change of Bridge Watch” checklist so that the OOW could communicate with them of any immediate safety concerns in a timely manner. It is thus desirable for the checklist to be clearer, such as having the inclusion of a descriptor box to indicate the type of work activities for the OOW’s awareness, an option of “N.A” when no work activity was being assigned and to note the means of communication.

2.4 Incidental findings

- 2.4.1 The CO’s opinion (see paragraph 1.5.3), that the ASD-1’s limitations in communicating in English may have prevented him from stopping the ASD-3 from using the ladder, was noted. The investigation team held the view that although the time for the ASD-1 witnessing the ASD-3 to be on the ladder and the incident was very short, recognising the SMS requirements on the use of an A-frame ladder, should have prompted the ASD-1 to exercise the stop work authority, when the ASD-3 was seen carrying the ladder.
- 2.4.2 Once the Master arrived on the Bridge, the immediate actions in turning the ship around for the search and instructing the 3O to broadcast the nature of the emergency to the ship as well as on the VHF, were in accordance with the required actions of the Company’s emergency procedures.
- 2.4.3 It was commendable that, despite the missing actions like sounding of ship’s horn, raising of the ‘Oscar’ flag and releasing the MOB marker buoy, as required by the Company’s Emergency Procedures Manual, the recovery of the ASD-3 from the water was fast and unhampered.
- 2.4.4 While the SMS allowed for the watchkeeping ASD to be assigned with other jobs when the weather is fair and during daylight hours, it is important for the OOW to know the whereabouts of the watchkeeping ASD in order to recall him when the need arises. In this case, the 3O did not know the location of the ASD-3, and the 3O did not maintain the communications as required.

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 ASD-3 did not inform anyone of his intention to use the portable ladder for the painting work. He had also not donned the required PPEs such as the safety harness with a lifeline or a fall arrestor, required by the SMS, when using the portable ladder.
- 3.2 The use of the portable ladder involved an RA and subsequently a PTW to be approved as required by the SMS, when the work activity is assessed as working aloft or work from height. Past records of the PTWs from the ship revealed that the ASD-3 had been issued with PTWs for the use of the portable ladder before this incident.
- 3.3 The reason for the ASD-3 to use the portable ladder could not be established but it is likely that the ASD-3 could have acted so, after feeling exhausted or discomfort with the painting technique using the tools provided after about an hour into the job.
- 3.4 The toolbox briefing for the painting work was not conducted on-site, missing the opportunity for the use of the portable ladder to be discussed.
- 3.5 The ASD-1 missed the opportunity to exercise a “stop work” authority required by the SMS when he saw the ASD-3 carrying an A-frame ladder which had not been approved for the task being performed.
- 3.6 The OOW was not aware of the painting work on the open-deck carried out by the two ASDs and had not maintained communications with the ASD-3, who was also the duty watchkeeping rating and did not know his whereabouts.
- 3.7 The “Change of Bridge Watch” checklist did not indicate any work activities being performed. The handing over (the CO) and taking over (the 3O) watchkeeping

officers had a different understanding on the type of work activities to be recorded in the checklist from the requirements of the SMS.

- 3.8 The “Change of Bridge Watch” checklist did not have fields to describe the work activities and for registering any restrictions to manoeuvres or machinery operations etc. relating to the work activities.
- 3.9 It would be desirable to include the means of communications between the OOW and the crew, who are performing work at locations such as on the open-deck or in the engine room, in the “Change of Bridge Watch” checklist.
- 3.10 Certain MOB actions were missed out by the crew. Nevertheless, the recovery of the ASD-3 from water was reasonable fast and unhampered.

4 SAFETY ACTIONS

During the course of the investigation and through discussions with the investigation team, the following preventive / corrective action(s) were taken by the Company of EB.

- 4.1 The Company promulgated to their fleet on an added a section in the SMS in providing guidance on the use of portable ladders which includes:
- Stating that “A portable ladder should only be used where no safer means of access is reasonably practicable. As a thumb rule the ladders can be used for work at height when a risk assessment has shown that using equipment offering a higher level of fall protection is not justified because of the low risk and short duration of use; or there are existing workplace features which cannot be altered. As a rough guide any work less than 45 minutes is short duration.” – sic
 - Requirement of the physical condition of the site where the ladder can be used safely, including on firm ground and away from other hazards. Also to ensure the locking device is engaged when using the ladder and not to stand on the top three steps of the ladder.
 - Physical checks of the ladder before being used.
- 4.2 The Company promulgated their investigation findings with their fleet, including sharing and briefing during the crew’s pre-joining sessions and Company’s seminars and forums.
- 4.3 Additional training with regard to the emergency procedures for MOB scenarios were carried out throughout the Company’s fleet.
- 4.4 The Company’s quarterly safety campaign for 3Q2021 focused on the safety awareness and procedures with regard to the established working aloft procedures and requirements. In addition, the requirements and process of using the STOP card authority was also raised.

5 SAFETY RECOMMENDATIONS

A safety recommendation is for the purpose of preventive action and shall in no case create a presumption of blame or liability.

5.1 For the Company of EB:

- 5.1.1 To provide clarity in the SMS on the need to record the type and location of work activities in the “Change of Bridge Watch” checklist. **[TSIB-RM-2022-01]**
- 5.1.2 To review the “Change of Bridge Watch” checklist, to include the fields to record restrictions on ship manoeuvres or operating machineries relating to the work activities being carried out at the open-deck or engine room. **[TSIB-RM-2022-02]**
- 5.1.3 To review the need of on-site toolbox briefing for deck work, with the purpose of improving assessment on the potential constraints and risks involved. **[TSIB-RM-2022-03]**
- 5.1.4 To ensure that the watchkeeping officers are aware of the watchkeeping ratings’ location at all times. **[TSIB-RM-2022-04]**
- 5.1.5 To indicate in the “Change of Bridge Watch” checklist on the requirement for the means of communications between the Bridge and the crew working at other locations such as the open-deck and engine room, especially with the watchkeeping ratings. **[TSIB-RM-2022-05]**