REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

PORT STANLEY CASUALTY INVESTIGATION REPORT

Occupational Fatality – Fall from Height

Guangzhou, People's Republic of China | 21 May 2019

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AUTHORITY

An investigation, under the authority of the Republic of the Marshall Islands laws and regulations, including all international instruments to which the Republic of the Marshall Islands is a Party, was conducted to determine the cause of the casualty.

Maritime Administrator

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PART 1: EXECUTIVE SUMMARY

On 21 May 2019, the Republic of the Marshall Islands-registered product tanker PORT STANLEY, managed by V.Ships (Germany) GmbH (the "Company"), was at the Guangzhou Wenchong Shipyard at Guangzhou, People's Republic of China undergoing repairs. During the afternoon, the Able Seafarer Deck (ASD) 1 fell shortly after he entered the No. 2 starboard (S) cargo oil tank (COT) to conduct an inspection. He was found on the tank top lying on his back, unconscious, breathing, and bleeding from his mouth and the back of his head. The ASD1 did not respond to first aid provided by the ship's crewmembers. He was evacuated from the tank and taken ashore for medical treatment. The Death Certificate reported that the ASD1 died due to serious brain and skull injuries.

The Republic of the Marshall Islands Maritime Administrator's (the "Administrator's") investigation identified the below factors.

1. Causal factors that may have contributed to this very serious marine casualty include:
   (a) the access ladder for the No. 2 S COT was obstructed by the ventilation duct and electrical cable that passed through the tank dome next to the vertical ladder and across the first platform;
   (b) ineffective supervision and oversight by the Fleet Superintendent who was responsible for implementing the Company's drydocking procedures;
   (c) ineffective supervision and implementation by the Master and Chief Officer (C/O) of the safe work practices on board the ship;
   (d) ineffective onboard hazards identification and communication;
   (e) the apparent ineffective safety culture on board PORT STANLEY while the ship was in the shipyard in May 2019; and

(f) the impact that the change of lighting may have had on the ASD1's vision as he entered the No. 2 S COT.

2. Additional factors identified during the Administrator's investigation include:

(a) uncertainty by the Master and C/O regarding whether the Company's enclosed space entry procedures were applicable while PORT STANLEY was in the shipyard;

(b) the Pumpman entering the No. 2 S COT after an Ordinary Seafarer (OS) 1 told him not to, as permitted by the Company's "Stop the Job" policy; and

(c) the Pumpman and Officer of the Watch (OOW) entering the No. 2 S COT to assist ASD1 without determining if there was an unsafe condition inside the tank or if the atmosphere was safe for entry.

PART 2: FINDINGS OF FACT

The following Findings of Fact are based on the information obtained during the Administrator's marine safety investigation.

1. Ship particulars: *see* chart to right.

2. On 4 May 2019, PORT STANLEY was moored port side to at a repair berth at the Wenchong Shipyard at Guangzhou, People's Republic of China. The planned work included extensive repairs in each of the ship's water ballast tanks (WBTs). Access to the WBTs was through the manholes on the main deck and through holes that had been cut in the lower portion of the longitudinal bulkhead between the COTs and the WBTs. The ship was scheduled to leave the shipyard on 23 May 2019.

3. The ship's Fleet Superintendent and six other Company technical staff were on board as supernumeraries to assist the crewmembers while the ship was in the shipyard.

4. The C/O met with the Bosun, Pumpman, and deck ratings at 0700[1] each day while the ship was in the shipyard to assign daily work and to conduct a job safety analysis and Toolbox Talk. The Company's Safety Management System (SMS) requires documented records of these daily work plans and job safety analyses, but there was no record of these plans as required by the SMS.

SHIP PARTICULARS

Ship Name
PORT STANLEY

Registered Owner
Novellas MT "St. Pauli" GmbH & Co. KG

ISM Ship Management
V.Ships (Germany) GmbH

Flag State
Republic of the Marshall Islands

IMO No.	Official No.	Call Sign
9246463	90299	V7EE9

Year of Build	Gross Tonnage
2003	29,998

Net Tonnage	Deadweight Tonnage
11,642	45,800

Length x Breadth x Depth
175.9 x 32.2 x 19.1 meters

Ship Type
Product Tanker

Document of Compliance Recognized Organization
DNV GL

Safety Management Certificate Recognized Organization
Lloyd's Register

Classification Society
DNV GL

Persons on Board
21 Crewmembers, 7 Supernumeraries

1 Unless otherwise specified, all times are ship's local time (UTC +8).

5. At 0900, the Master, C/O, Chief Engineer (C/E), and Fleet Superintendent met with the yard's Supervisor and Safety Officer to hold a daily safety meeting and plan the work for the day.

6. The Second Officer (2/O) and the Third Officer (3/O) stood duty as the OOW while PORT STANLEY was in the shipyard. They were on a "six hours on, six hours off" watch schedule and stood watch on the Bridge. The OOWs were not assigned any additional duties while the ship was in the shipyard other than to make periodic safety rounds on deck. Neither the Master nor the C/O made the OOW aware of planned daily work.

7. The WBTs and COTs were identified as enclosed spaces in accordance with the Company's SMS. They were ventilated using blowers located on the main deck with flexible ducts that extended to the bottom of each tank. Portable lighting was also installed. The shipyard provided the blowers, ducts, and portable lighting.

8. Daily, the shipyard staff checked the atmosphere inside the WBTs and COTs. They also posted gas free certificates at the COT domes and WBT manholes.

9. The C/O stated he occasionally checked the atmosphere inside the tanks.

10. The C/O stated that, from 14 May 2019 onwards, inspections of the COTs for damage caused by the shipyard workers were conducted. Initially he conducted these inspections but, on several days, he assigned ASD1 to complete them. He indicated he last assigned this task to ASD1 on 18 May 2019. The C/O did not maintain a written record of the inspections or who conducted them.

11. Enclosed Space Entry Permits had been issued as required by the Company's SMS when the ship's crewmembers were required to enter enclosed spaces for the first days after the ship entered the shipyard. Afterwards, they were then issued only occasionally. An Enclosed Space Entry Permit had been issued when the C/O conducted an inspection of the No. 5 port (P) COT on 19 May 2019.

Incident Description

12. At 0700 on 21 May 2019, the C/O met with the Pumpman, Bosun, and other deck crewmembers to assign daily work and conduct a job safety analysis and Toolbox Talk. The work plan and job safety analysis were not documented as required by the Company's SMS.

13. Throughout the day on 21 May 2019, ASD1 had been working on deck with the Pumpman. Sometime before 1500, the ASD1 told the Pumpman that after teatime[2] he needed to complete a COT inspection.

14. At about 1530, the ASD1 asked the OS1 to assist him with the inspection of No. 2 S COT, No. 3 P COT, and the S slop tank.

15. The C/O stated that he did not assign the ASD1 to conduct any tank inspections on 21 May 2019. The OS1 stated that he and the ASD1 had conducted tank inspections together since the C/O assigned this task to the deck crewmembers on 18 May 2019. OS1 stated that he would remain on deck near the tank dome while ASD1 entered the tanks.

2 Teatime was from 1500–1530.

16. Both the ASD1 and the OS1 were wearing a boiler suit, safety helmet, safety shoes, and were carrying radios with a strap slung around their necks. It was reported that both were also carrying flashlights. OS1 stated that ASD1 was carrying a camera in his pocket.

17. At about 1540, the ASD1 informed the OOW, who was the 2/O, that he was entering No. 2 S COT to take pictures. The 2/O stated that ASD1 with OS1's assistance had regularly entered the COTs to conduct inspections. The 2/O also said he did not ask ASD1 who had assigned him to this task, or if he and the OS1 had all the required personal protective equipment (PPE). The 2/0 did not inform the C/O that ASD1 was entering the tank.

18. An Enclosed Space Entry Permit was not issued for the ASD1's planned entry into the No. 2 S COT, No. 3 P COT, and the S slop tank. Each of these tanks had previously been identified as enclosed spaces.[3]

19. The OS1 stated that he heard a loud noise approximately 15 seconds after the ASD1 had started climbing down the vertical ladder leading to the first platform. He stated he looked down into the tank and saw the ASD1 falling.

20. There were no crewmembers or Company representatives in the tank when the ASD1 fell. In addition, the Administrator did not receive any information indicating that any of the shipyard workers who were in the tank saw the start of his fall.

No. 2 S COT Access

21. The tank was accessed through the tank dome using a vertical ladder that extended down through an opening in the main deck to the first platform. From the first platform there were a series of four inclined ladders with three additional platforms leading down to the tank top *(see Figure 1)*.[4]

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3 The Company's procedures require that crewmembers entering an enclosed space carry a personal gas monitor. They also require that a breathing apparatus (BA) be available at the entrance to the space. Neither ASD1 nor OS1 were wearing a gas monitor. OS1 stated he brought an emergency escape breathing device (EEBD) and placed it on the deck next to the tank dome.

4 PORT STANLEY was required by the International Convention for the Safety of Life at Sea (SOLAS), 1974, Chapter II-1, regulation 12-2 to be fitted with permanent means of access for accessing the COTs. SOLAS regulation II-1/12-2 was adopted by International Maritime Organization (IMO) Resolution MSC.27(61). This regulation was applicable to oil tankers of 500 gross tons and over constructed on or after 1 October 1994. It was incorporated into SOLAS regulation II-1/3-6.1 and made applicable to oil tankers of 500 gross tons and over constructed on or after 1 October 1994 but before 1 January 2005 when amendments to chapter II-1 were adopted by IMO Resolution MSC.134(76).

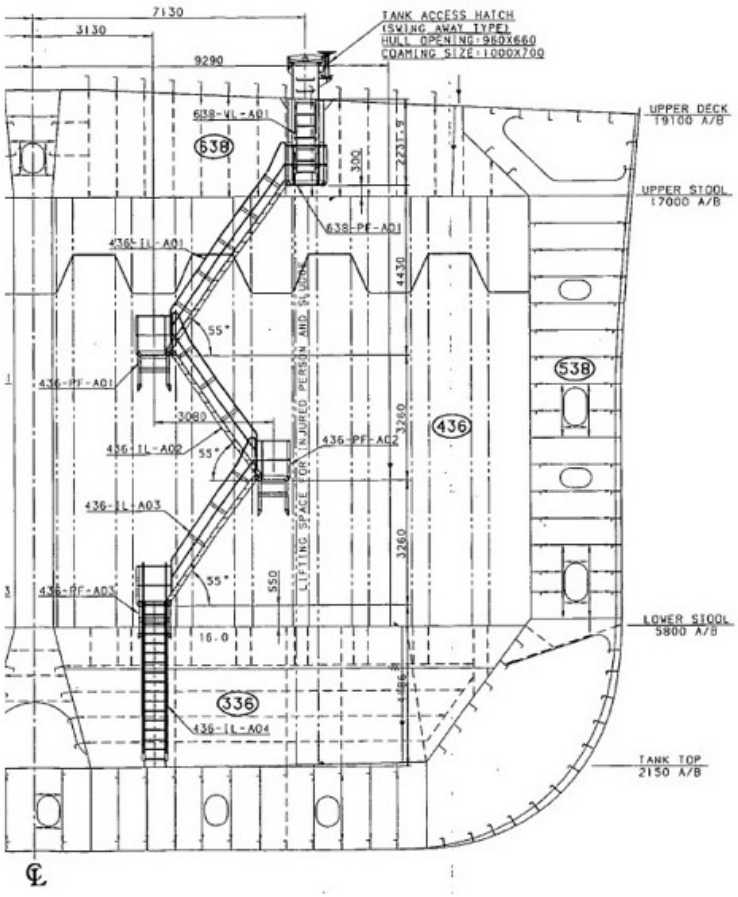

Figure 1: Forward bulkhead for No. 2 S COT showing the access ladder.

22. The length of the vertical ladder that extended through the tank down to the first platform inside the tank was 2.5 meters (m). The rungs were 600 millimeters (mm) wide and spaced 300 mm apart. The platform was 1 x 1 m. The inclined ladders and the platforms were fitted with guard rails that consisted of an upper rail that was 1,000 mm high when measured from the top of the platform and an intermediate rail that was 500 mm high.[5]

23. On 21 May 2019, the ventilation duct and electrical cable passed through the tank dome and extended to the tank top *(see Figure 2)*.

5 The IMO did not adopt technical provisions for the implementation of SOLAS II-1/12-2. However, it is noted that dimensions of the vertical ladder, the platform, and the guardrails are consistent with those required by IMO Resolution MSC.133(76), Adoption of Technical Means of Access for Inspections. This resolution was adopted by the IMO to facilitate the implementation of SOLAS regulation II-1/3-6, which is applicable to oil tankers of 500 gross tons and over constructed on or after 1 January 2006.

Figure 2: The entrance to No. 2 S COT (left) showing the vertical ladder inside the tank dome and the ventilation duct and cable. The access ladder inside the tank (right) showing the forward bulkhead, lighting and ventilation duct extending to the bottom of the tank. The pictures were taken on 22 May 2019. It was reported that the ventilation duct, cable, and lighting had not been moved since the ASD1's fall.

24. The ventilation trunk and electrical cable extended down along the inboard side of the vertical ladder and across the first platform. Both the ventilation duct and the electrical cable passed over the top course of the safety rail around the first platform *(see Figures 2 and 3)*.

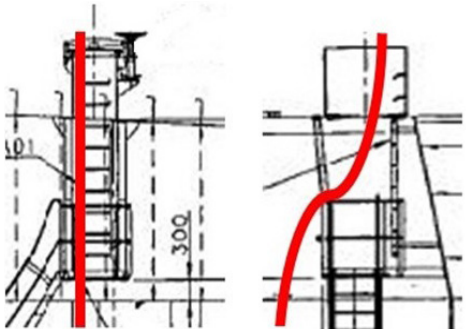

Figure 3: Detail of the entrance to No. 2 S COT showing the vertical ladder, the first platform, and the location of the ventilation duct (red line). The duct is not drawn to scale.

25. The portable lights rigged by the shipyard extended from the second platform to the bottom of the ladder *(see Figure 2)*. Portable lighting was not provided for the first platform.

26. The OS1 stated that crewmembers had previously discussed how the ladders into the COTs were obstructed by the ventilation ducts and cables, and that it was difficult to enter and exit the tanks. It was not clear that their concern was discussed with the C/O, the Master, or the Fleet Superintendent.

27. The permanent means of access to the tank was found in good condition and free of defects when inspected after this incident.

Emergency Response

28. The OS1 informed the OOW by radio when he saw the ASD1 fall. The OOW was on the Bridge and immediately informed the Master before heading to the tank access. The emergency was announced and the C/O along with other crewmembers immediately responded with rescue and first aid equipment.

29. The Pumpman was the first crewmember to reach the tank dome. The Pumpman stated that when he arrived at the tank dome, the OS1 told him to not enter the tank. The Pumpman then asked him what had happened and was told that ASD1 had fallen.

30. The Pumpman reported seeing shipyard workers coming out of the tank, assumed it was safe to enter, and decided to enter to assist the ASD1.[6]

31. The Pumpman stated he found ASD1 lying on his back on the tank top just outboard of the first and third platforms *(see Figures 1 and 2)*. The Pumpman stated that ASD1 was unconscious, appeared to be breathing and that he was bleeding from his mouth and the back of his head. He then used his radio to call for assistance evacuating ASD1. The Pumpman then removed ASD1's boots and gloves and then began rubbing his hands while talking to him.

32. According to the Pumpman's statement, he saw the ASD1's safety helmet lying beside his head and a camera next to his boiler suit pocket. The Pumpman also observed that he did not see any of the shipyard workers approach him or the ASD1 and that he had to step carefully while on the ladder to avoid loose tools that were lying on the platforms.

33. The OOW stated that after notifying the Master he then went to the tank. The OOW reported that when he arrived at the tank dome, he saw shipyard workers leaving the tank and assumed it was safe to enter it.

34. The OOW reported that when he reached the ASD1, he observed that he was breathing and that his head and face were bleeding heavily. He stated that the Pumpman was rubbing ASD1's hands and talking to him.

35. At approximately the same time, the C/O and other crewmembers, who were bringing first aid and rescue equipment, arrived at the tank dome. The C/O then directed the OS1 to enter the tank with first aid equipment to assist the OOW and Pumpman. He also directed the other crewmembers to lower a stretcher into the tank.

36. By 1610, the ship's agent had been informed that the ASD1 required medical evacuation and was asked to call for an ambulance. The ambulance arrived in about 10 minutes.

37. The stretcher had been lowered to the bottom of the tank by the time the OS1 reached the ASD1. The ventilation duct was then removed from the tank entrance.

38. The OOW, Pumpman, and OS1 immediately strapped the ASD1 onto the stretcher and observed that he was still unconscious but appeared to be breathing.

39. The ship's crewmembers and some yard workers hoisted the ASD1 out of the tank under the direction of the C/O.

6 The Pumpman did not report checking for a gas free certificate before entering the tank. He entered the tank without a BA or a personal gas meter.

40. By 1630, the ASD1 had been transferred ashore and taken by ambulance to a nearby hospital.

41. At 1830, the agent informed the Master that the ASD1 had died. The Death Certificate issued by the local authorities reported that the cause of the ASD1's death was serious brain and skull injuries.

Human Factors

42. PORT STANLEY had a complement of 21 crewmembers, five more than required by the Minimum Safe Manning Certificate issued by the Administrator. All held the appropriate Republic of the Marshall Islands-issued seafarer documentation for their positions on board.

43. The ship's Fleet Superintendent along with six other members of the Company's shore side staff were on board monitoring the work done by the shipyard and assisting the Master, C/O, and C/E.

44. Crewmember experience:

RANK	TIME ON BOARD PORT STANLEY	TIME IN RANK	TIME WITH COMPANY	TOTAL TIME AT SEA
Master	5 days	5.7 years	6.0 years	26 years
C/O	1.8 months	1.6 years	10.1 years	12 years
2/O	1.6 months	6.2 years	11 years	11 years
Pumpman	6.8 months	5 years	25.5 years	25.5 years
ASD1	7.6 months	8.1 years	11.1 years	15 years
OS1	15 days	6 years	3.3 years	6 years

45. The Master at the time of the accident had joined the ship at short notice on 16 May 2019 after the prior Master was hospitalized.[7] On 17 May 2019, the formal handover was completed after he was discharged from the hospital.

46. Each of the ship's senior officers had carried out a drydocking for the Company within five years of PORT STANLEY entering the shipyard in May 2019.

47. There was no indication that any crewmembers involved with this incident had failed to receive the amount of rest mandated by the IMO's Seafarers Training, Certification and Watchkeeping (STCW) Code, Section A-VIII/1, paragraphs 2 and 3 and the International Labour Organization's Maritime Labour Convention, 2006 (MLC, 2006), Regulation 2.3.

48. Alcohol testing of the crewmembers was conducted on the evening of 21 May 2019 and indicated blood alcohol content of each crewmember was 0.0%.

49. The Fleet Superintendent had seven years of experience working in ship management and had worked for the Company for approximately two years. He had been at sea for 20 years and had sailed as a C/E

7 The prior Master had been admitted to the hospital on 14 May 2019.

for nine years. As a Fleet Superintendent, he had overseen the completion of seven major drydockings in the previous five years.

50. All of the involved seafarers had completed the Company's required shipboard familiarization training after joining the ship. This familiarization training included a review of when Enclosed Space Entry Permits, Hot Work Permits, and general permits to work were required.

51. The Pumpman reported that he was a family friend of the ASD1.

Safety Management

52. As required by the IMO's International Management Code for the Safe Operation of Ships and for Pollution Prevention (International Safety Management (ISM) Code), the Company's SMS provided processes and procedures for shipboard operations and maintenance. These include a detailed process for drydocking ships in its fleet. This process is also applicable for ships undergoing repairs in a shipyard while afloat. It also includes enclosed space entry procedures.

53. A ship's Fleet Superintendent is designated by the Company's SMS as the person responsible for the drydocking process. The tasks assigned to the Fleet Superintendent by this process include sending the ship's Master the Company's risk assessment for drydocking three months before the drydock date. The Fleet Superintendent is required to attend the ship throughout the time it is in drydock or in the shipyard to ensure that all work is completed satisfactorily.

54. The Company's generic risk assessment for drydocking was last reviewed on board PORT STANLEY on 9 September 2018 by the Master, C/O, C/E, and Second Engineer. This was the required annual review of the Company's VMS.[8] None of the officers who conducted this review were on board the ship when it entered the shipyard.

55. There is no information available to the Administrator indicating that the Fleet Superintendent sent the Master a risk assessment as required by the Company's SMS. The Fleet Superintendent and the shipboard management team did not review the generic risk assessment for drydocking either before or after the ship entered the shipyard on 4 May 2019 as required by the Company's SMS.

56. The generic risk assessment for drydocking identified hazards to the safety of the ship and to the crewmembers. These included deaths due to asphyxiation, and slips, trips, and falls.

57. The Company's drydocking process requires that all its procedures apply to hot-work and other higher risk tasks undertaken by the ship's crewmembers or outside contractors while the ship is in drydock or in a shipyard. The generic risk assessment for drydocking does not include a similar statement.

58. The Company's SMS requires the completion of daily work planning meetings. The SMS also requires that any planned work be documented on a daily work plan using the form ADM 37. This plan is also required to identify those who will perform the work and the required PPE, work permits, risk assessments, and Toolbox Talks. The completed plan is supposed to be posted on the Bridge, in the Engine Control Room (ECR), and on crewmember notice boards. There is no record that daily work plans were

8 These four officers are identified by the Company's SMS as the shipboard management team.

completed while PORT STANLEY was in the shipyard in May 2019, nor any indication that the Fleet Superintendent raised this with the Master.

59. The Company's enclosed space entry procedures require completing a risk assessment and issuing an Enclosed Space Entry Permit before entering an enclosed space.[9] Assessing whether the access to the space is free of obstructions is not required when issuing a permit.

60. When interviewed after the ASD1's fall, the Master stated it was not necessary to complete a risk assessment or issue an Enclosed Space Entry Permit for a crewmember to enter an enclosed space while the ship was in the shipyard. However, he did say this was done occasionally. To support this, he provided a copy of an Enclosed Space Entry Permit that had been issued for the C/O to inspect the No. 5 P COT on 19 May 2019.

61. The C/O and OOW both stated that it was not clear if the Company's requirements for enclosed space entry applied while the ship was in the shipyard.

62. Enclosed space entry training, which included a review of the Company's procedures and completing an enclosed space rescue drill, was conducted on 14 April 2019. The ASD1 and the Pumpman both participated in this training.

63. The Company's SMS includes a "Stop the Job" policy. This empowers any crewmember who witnesses an unsafe act/condition, or deems it necessary, to intervene and stop the job.

PART 3: ANALYSIS

The following Analysis is based on the above Findings of Fact.

The ASD1's Fall

The start of the ASD1's fall was not witnessed. Therefore, it is not possible to determine with certainty how he fell. It is known that the OS1 heard a loud noise and then saw the ASD1 falling within about 15 seconds after the ASD1 entered the No. 2 S COT. He was found lying on the tank top almost directly below the first a nd third platforms *(see Figures 1 and 2)*.

The ventilation duct and electrical cable extended down along the inboard side of the vertical ladder and across the first platform *(see Figure 3)* obstructing access to the inclined section of the ladder leading to the second platform. This would have required the ASD1 to go over, around, or under the duct after he was on the platform, or to pass over it while he was still descending the vertical ladder. Although it cannot be established how the ASD1 may have tried to move past the ventilation duct, there is sufficient available information to conclude that the duct likely interfered with the ASD1 as he was entering the tank.

9 Conditions for issuing an Enclosed Space Entry Permit include determining that: the atmosphere is safe for entry; ventilation is provided; required equipment is available and ready for use; and there is adequate lighting inside the enclosed space.

There were lights in the tank, but they were located below the first platform. There was also a light inside the tank dome *(see Figure 2)*. The ladder and the first platform would have been lit by sun light passing through the entrance to the tank. Although it cannot be determined with certainty, the ASD1's vision may have been impaired as his eyes adjusted from the bright daylight on deck to the relatively dark interior of the tank *(see Figure 2)*.[10] Any impairment of his vision due to the change of lighting could potentially have interfered with his ability to see as he first entered the tank.

No. 2 S COT Access Ladder

The permanent means of access to the No. 2 S COT was found in good condition and free of defects when inspected after this incident. The dimensions of the vertical ladder, top platform, and the guard rails were consistent with the technical standards established by the IMO for permanent means of access to COTs on oil tankers constructed on or after 1 January 2006. This is an indication that the design and construction of the vertical ladder, platform, and guard rails likely did not contribute to the ASD1's fall while entering the tank.

SMS

The Company's SMS includes procedures for ensuring the safety of its ships and crewmembers. These include safe work procedures addressing, among other things, daily work planning, the identification and control of hazards, supervision, and enclosed space entry. The SMS also includes a procedure for drydocking ships in the Company's fleet that is applicable for ships undergoing repairs in a shipyard while afloat.

Daily Work Planning

The safe work procedures in the Company's SMS include requirements for daily work planning that are supposed to include the identification of the planned work, who will perform it, and required PPE needed. It also requires identifying any needed work permits, risk assessments, and if a Toolbox Talk must be completed. Copies of this form are required to be posted on the Bridge, in the ECR, and crewmember notice boards. The procedure is applicable whether a ship is in or out of a shipyard.

Although the C/O conducted daily work planning meetings and Toolbox Talks, there is no record that daily work plans were completed as required while PORT STANLEY was in the shipyard in May 2019.

Based on interviews with the C/O and OS1, there may have been a lack of clear understanding regarding whether the C/O had tasked the ASD1 with inspecting any of the COTs on 21 May 2019.

There is no indication that either the Master or the Fleet Superintendent questioned why the C/O did not complete a daily work plan as required by the Company's SMS while PORT STANLEY was in the shipyard. This is an indication of inadequate supervision.

10 It is noted that the United Kingdom Maritime Coastguard Agency's Code of Safe Working Practices for Merchant Seafarers (2015 edition, amended 4 October 2019), paragraph 11.5.2 states that lighting should be arranged to minimize "the formation of deep shadows and sharp contrasts in the level of illumination between one area and another."

Enclosed Space Entry

The ASD1's fall occurred inside an enclosed space. Neither a risk assessment was conducted, nor was an Enclosed Space Entry Permit completed before his planned entry into the No. 2 S COT, No. 3 P COT, and the S slop tank on 21 May 2019.[11]

The Company's drydocking procedures states that all Company procedures apply to hot-work and risk-related works undertaken by ship's crewmembers or Company employed contractors while the ship is on drydock or in a shipyard. It does not indicate if risk-related works include enclosed space entry. The Master, C/O, and OOW stated that the Company's enclosed space entry procedures did not apply or that it was unclear if they applied when a crewmember entered an enclosed space while the ship was in the shipyard. Further, there is no indication the Fleet Superintendent questioned why the Company's enclosed space procedures had not been implemented when a member of PORT STANLEY's crew entered an enclosed space while the ship was in shipyard in May 2019.[12]

The Company's enclosed space entry procedures do not require assessing the means of access to ensure that crewmembers can safely enter and exit an enclosed space, or that a rescue operation can be conducted safely and efficiently prior to issuing an Enclosed Space Entry Permit.[13]

The Pumpman stated he assumed it was safe to enter the tank to assist the ASD1 because he saw shipyard workers leaving it. There is no indication he attempted to determine if there was an unsafe condition, such as a fire, inside the tank that had caused the shipyard workers to leave it. The OOW also stated he assumed it was safe to enter the tank because he saw shipyard workers were leaving it.

The response of both the Pumpman and the OOW to enter the tank to render assistance is not unique. All too often seafarers have rushed into an enclosed space to assist a fellow crewmember, sometimes with fatal consequences. Fortunately, neither the Pumpman nor the OOW suffered any adverse effects after entering the tank without confirming if the atmosphere inside was safe for entry, or if there was another unsafe condition inside.

The fact that the Company's enclosed space entry procedures had not been consistently implemented while PORT STANLEY was in the shipyard in May 2019 may have contributed to their decision to enter the tank without following those procedures. The fact the Pumpman was a family friend of the ASD1 may also have contributed to his decision to enter the tank.

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11 As previously stated, he also did not have a personal gas meter with him nor was a BA set immediately available at the entrance to the tank as required by the Company's enclosed space entry procedures.

12 It is noted that the generic risk assessment for drydocking did not identify the Company's enclosed space entry procedures as an existing control measure to reduce the risks associated with entering an enclosed space. This may have contributed to the Master's and C/O's uncertainty regarding whether these procedures applied while the ship was in the shipyard.

13 Limited openings for entry and exit are one characteristic of an enclosed space. *See* IMO Resolution A.1050(27), Revised Recommendations for Entering Enclosed Spaces Aboard Ships.

Hazard Identification and Communication

It is a common practice to pass ventilation ducts and electrical cables through tank entrances when work is being conducted inside. This can create a potential safety hazard. There is no indication that it had been identified by the Fleet Superintendent, the Master, or the C/O, nor communicated to them by the crewmembers, who reportedly had discussed this amongst themselves. It is noted that this hazard could have been addressed by passing the ducts and electrical cables through other available openings, such as those for the COT washing machines.[14]

Safety Culture

"An effective safety culture will support a shipboard environment that encourages and requires all on board to proactively consider their own and others' safety."[15] An effective safety culture requires commitment from senior management. It also requires that both shore-based and sea staff at all levels believe in safety, think safety, and be fully committed to safety.[16]

There are several indicators that there may not have been an effective safety culture on board PORT STANLEY while in drydock in May 2019. These include:

1. the fact there is no indication that the Fleet Superintendent prepared a risk assessment or that either he or the shipboard management team reviewed the generic risk assessment for drydocking either before or after the ship entered the shipyard on 4 May 2019 as required by the Company's drydocking procedure;

2. the fact that neither the Master nor the Fleet Superintendent questioned why the C/O did not complete a daily work plan as required by the Company's SMS while the ship was in the shipyard;

3. the apparent lack of certainty as to whether the Company's enclosed space entry procedures were applicable when crewmembers entered enclosed spaces while the ship was in the shipyard;

4. ineffective hazards identification and communication in that:

   (a) neither the Master, C/O, nor Fleet Superintendent identified the risk to safety associated with the ventilation duct and electrical cables being passed through tank domes and obstructing the access ladder;

   (b) written daily work plans were not completed and posted as required by the Company's SMS; and

   (c) that there is no indication that the deck ratings communicated their concern of the potential risks caused by the obstruction to the ladders;

5. the non-compliance with the Company's "Stop the Job" policy when the Pumpman entered the No. 2 S COT after OS1 told him to not enter the tank; and

14 An opening can be seen in *Figure 2*.

15 International Chamber of Shipping and International Shipping Federation, Guidelines on the Application of the IMO International Safety Management Code, 4th ed (2010), p. 86.

16 *Ibid*, p. 88. See also, ISM Code, Preamble.

6. the crewmembers entering the No. 2 S COT to assist the ASD1 without first determining if there was an unsafe condition inside the tank.

The apparent lack of an effective safety culture had existed prior to the current Master joining the ship on 16 May 2019 and was still existing when the ASD1 fell inside the tank.

PART 4: CONCLUSIONS

The following Conclusions are based on the above Findings of Fact and Analysis and shall in no way create a presumption of blame or apportion liability.

1. Causal factors that may have contributed to this very serious marine casualty include:
   (a) the access ladder for the No. 2 S COT was obstructed by the ventilation duct and electrical cable that passed through the tank dome and across the first platform;
   (b) ineffective supervision and oversight by the Fleet Superintendent who was responsible for implementing the Company's drydocking procedures;
   (c) ineffective supervision and implementation by the Master and C/O of the safe work practices on board the ship;
   (d) ineffective onboard hazards identification and communication;
   (e) the apparent ineffective safety culture on board PORT STANELY while the ship was in the shipyard in May 2019; and
   (f) the impact that the change of lighting may have had on ASD1's vision as he entered No. 2 S COT.
2. Additional factors that were identified but that did not contribute to this very serious marine casualty include:
   (a) uncertainly by the Master and C/O regarding whether the Company's enclosed space entry procedures were applicable while PORT STANLEY was in the shipyard;
   (b) the Pumpman entered the No. 2 S COT after OS1 told him not to, as permitted by the Company's "Stop the Job" policy; and
   (c) the Pumpman and the OOW entered the No. 2 S COT to assist the ASD1 without determining if there was an unsafe condition inside the tank or if the atmosphere was not safe for entry.

PART 5: PREVENTIVE ACTIONS

In response to this very serious marine casualty, the Company has taken the following Preventive Actions.

1. The Company sent a Safety Circular with the lessons learned during its preliminary investigation that was discussed during a safety stand down on all ships in its fleet. These lessons learned included:

(a) the need for all job safety assessments, risk assessments, and Toolbox Talks to be conducted while a ship is in the shipyard to ensure that all potential hazards to personal safety are identified and control measures implemented;

(b) the need to plan all work efficiently; and

(c) ensuring that all work planning is documented on an ADM 37.

2. A case study based on this incident was prepared for use during crewmember seminars, Superintendent Safety Briefings, and pre-joining briefings for Masters and C/Es.

3. A drydocking safety campaign was undertaken that included:

(a) reviewing and revising the Company's drydocking procedures. Changes were made to the Fleet Superintendent's daily drydock report and revisions to the checklists for the initial drydocking meeting and the site safety assessment. Changes were also made to the shipyard evaluation and assessment form;

(b) requiring attendance when possible by a member of the Company's Health, Safety, Environmental, and Quality staff or a Marine Superintendent to provide additional oversight when a ship first enters drydock and to reinforce Company expectations regarding the onboard safety culture; and

(c) developing a drydocking safety assurance eLearning course for Superintendents and seafarers.

PART 6: RECOMMENDATIONS

The following Recommendations are based on the above Conclusions and in consideration of the Preventive Actions taken.

1. It is recommended that the Company review and, as necessary, revise:

(a) its enclosed space entry procedures to clearly establish whether they are applicable while a ship is in the shipyard;

(b) its Enclosed Space Entry Permit and risk assessment to address whether the means of accessing an enclosed space is free of obstructions;

(c) its enclosed space rescue training considering the lessons learned from this incident;

(d) its "Stop the Job" policy considering the lessons learned from this incident; and

(e) its procedures for monitoring and assessing the performance of Fleet Superintendents and ships' senior officers with respect to their compliance with the Company's safe work procedures.

2. It is recommended that the Company carryout an awareness campaign directed toward shore staff and ships' crewmembers addressing the importance of conducting thorough risk assessments to ensure ship operations and daily tasks are conducted safely. It is recommended that consideration also be given to conducting

periodic refresher training for shore staff and all officers working on ships in the Company's fleet to reinforce Company expectations for conducting risk assessments.

3. It is recommended that the Company review and, if deemed necessary, revise how shore staff and ships' senior officers communicate the Company's commitment to safety with ships' crewmembers in order to enhance the safety culture on board ships in its fleet. It is also suggested that periodic refresher training addressing safety communications be held for shore staff and senior officers.

The Administrator's marine safety investigation is closed. It will be reopened if additional information is received that would warrant further review.