



REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

LA DONNA I CASUALTY INVESTIGATION REPORT

Deck Cadet Enclosed Space Fatality

Paradip, India | 14 August 2018

Official Number: 5578

IMO Number: 9591428



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AUTHORITY

An investigation under the authority of Republic of the Marshall Islands laws and regulations, all conventions, treaties and other 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

The Republic of the Marshall Islands-registered bulk carrier LA DONNA I, managed by FML Ship Management Ltd. (the “Company”), arrived in the Port of Paradip, India on 12 August 2018 to discharge a cargo of 61,557 metric tons (MT) of coal.

At approximately 1730¹ on 14 August 2018, during cargo discharge operations, the Deck Cadet was reported to have been incapacitated due to oxygen deficient conditions in the enclosed Australian ladder² trunk of Cargo Hold No. 6. In response to the incident, the Chief Officer (C/O) entered the space to assist the Deck Cadet and subsequently lost consciousness. The Deck Cadet and C/O were rescued from Cargo Hold No. 6 by the ship’s crew. The C/O regained consciousness and recovered, however, the Deck Cadet did not survive.

The Republic of the Marshall Islands Maritime Administrator’s (the “Administrator’s”) marine safety investigation concluded that the causal factors that contributed to the Deck Cadet’s loss of life include:

- (a) asphyxiation due to insufficient oxygen levels within the space where he was working;
- (b) the C/O’s failure to properly identify the Australian ladder trunk as an enclosed space when he entered, and subsequently directed the Deck Cadet to enter, the cargo holds;
- (c) the failure of the C/O to identify the potential hazards despite the warning statement present on each access hatch cover;

¹ Unless otherwise stated, all times are ship’s local time (UTC + 5.5).

² The term Australian ladder refers to a design of a cargo hold access ladder specified under the Australian Maritime Safety Authority’s Marine Order 32 (Cargo handling equipment) 2016. These regulations require that all vertical and inclined ladders be provided with landing platforms not more than 6 meters (m) apart vertically. The use of a spiral type ladder is considered an inclined ladder, but the intermediate landings are not required.

- (d) the failure of the Deck Cadet to follow the OS’s advice that a self-contained breathing apparatus (SCBA) should be used when entering the enclosed trunk;
- (e) the failure of the Deck Cadet to identify the potential hazards despite the warning statement present on each access hatch cover; and
- (f) the C/O’s failure to follow and enforce enclosed space entry and rescue procedures.

Additional causal factors which likely contributed to the Deck Cadet’s loss of life include:

- (a) lack of familiarity with ship design characteristics in relation to design of the enclosed Australian ladders within the cargo holds;
- (b) inadequate onboard implementation of pre-task risk identification, assessment, and control procedures;
- (c) inadequate supervision of trainee crewmembers during high-risk or non-routine work assignments;
- (d) ineffective communication amongst crewmembers related to the transfer of duties and responsibilities;
- (e) delays in effecting a properly organized rescue of the Deck Cadet due to the C/O attempting a rescue alone and without raising the general alarm; and
- (f) ineffective onboard implementation of “Stop the Work” policy when crewmembers observed unsafe actions or conditions.

PART 2: FINDINGS OF FACT

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

1. Ship particulars: see chart to right.

Cargo Hold Configuration

2. LA DONNA I has seven cargo holds which are fitted with McGregor sliding hatches. Access to the cargo holds is provided by two fixed ladders: a vertical ladder with intermediate landings and an Australian ladder.
3. Each cargo hold is fitted with four access hatches. Two access hatches lead to the forward and aft inspection platforms, one

SHIP PARTICULARS

Ship Name
LA DONNA I

Registered Owner
Parvana Shipmanagement S.A.

ISM Ship Management
FML Ship Management Ltd.

Flag State
Republic of the Marshall Islands

IMO No. 9591428	Official No. 5578	Call Sign V7FD2
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Length x Breadth x Depth
222.75 x 32.26 x 20.25 meters

Year of Build 2014	Gross Tonnage 43,717
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Net Tonnage 26,513	Deadweight Tonnage 79,104
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Ship Type
Bulk Carrier

Document of Compliance
Recognized Organization
DNV GL

Safety Management Certificate
Recognized Organization
Lloyd’s Register

Classification Society
Lloyd’s Register

Persons on Board
22

access hatch leads to the vertical ladder, and one access hatch leads to the Australian ladder (see Figure 1). The straight ladders are open to the cargo holds while the Australian ladders on board LA DONNA I are contained within an enclosed trunk space. The bottom of the Australian ladder trunk opens to a vertical ladder which leads to the cargo hold tank top.

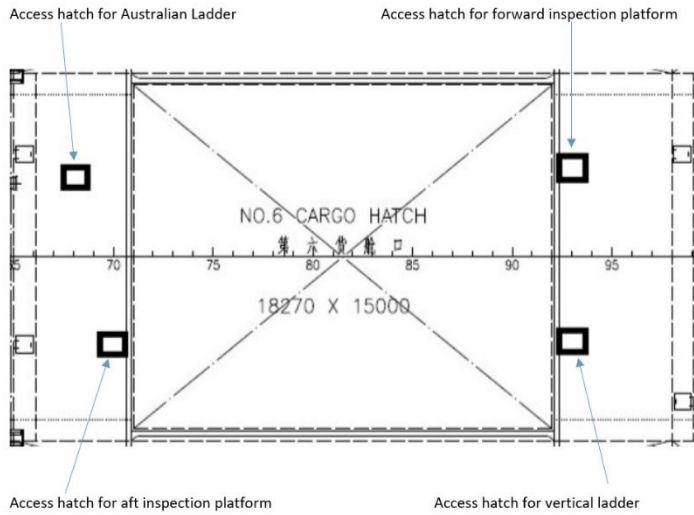


Figure 1: Cargo Hold No. 6 configuration.

4. An access hatch from the main deck leads to an intermediate platform by way of a 2.5 m vertical ladder. Another vertical ladder then descends approximately 2.75 m to a platform at the top of the Australian ladder. This second vertical ladder and platform are contained within the same enclosed trunk as the Australian ladder (see Figure 2).

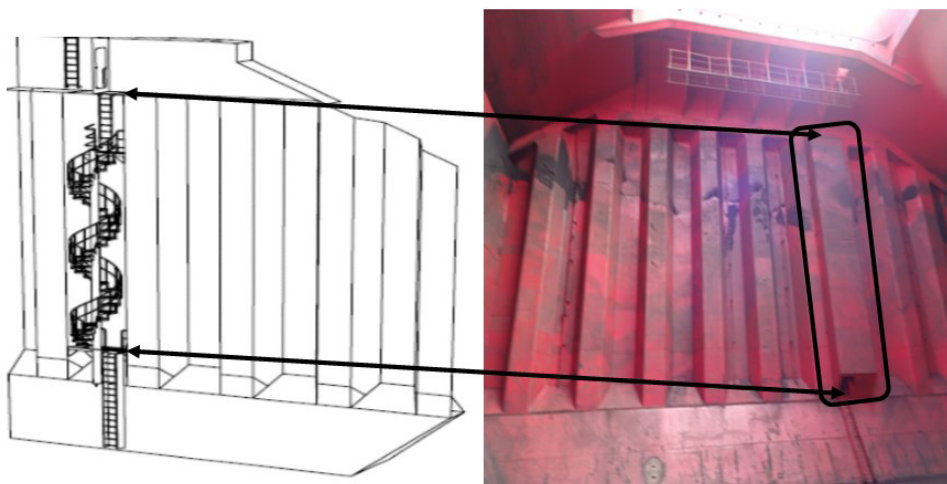


Figure 2: Enclosed Australian ladder on board LA DONNA I.

5. All access hatches for the cargo holds were marked with the warning “LACK OF OXYGEN” regarding the possible presence of an oxygen deficient atmosphere (see Figure 3).



Figure 3: Access hatch for Cargo Hold No. 6.

Incident Description

6. At 1842 on 12 August 2018, LA DONNA I berthed at the Paradip Multi-Purpose Berth (MPB) to discharge a cargo of 61,557 MT of coal. The cargo hold hatch covers were opened after berthing. Cargo discharge using shore cranes started at 0440 on 13 August 2018. The atmosphere in the cargo holds and adjacent spaces was not tested prior to the start of cargo discharge operations.³
7. On 14 August 2018, a Technical Superintendent, who was on board to conduct a routine shipboard inspection, asked the C/O to provide current photographs of hatch covers, hatch coamings, cargo holds, access hatches, and Australian ladders for his inspection report.
8. At 1430, the C/O tasked the Deck Cadet with taking the required photographs. They went to Cargo Hold No. 1 so that the C/O could show the Deck Cadet which areas to photograph. The C/O entered Cargo Hold No. 1 through the access hatch, which was reported to have already been open, in order to photograph the Australian ladder. The Deck Cadet remained on deck during this time.
9. The C/O then instructed the Deck Cadet to take the necessary photographs of the remaining cargo holds. The C/O also assigned an OS to assist the Deck Cadet with this task. The Master later stated that he was unaware that the C/O had been requested by the attending Technical Superintendent to photograph the cargo holds, or that the C/O had assigned this task to the Deck Cadet and an OS.

³ The International Maritime Organization (IMO) International Maritime Solid Bulk Cargoes (IMSBC) Code Appendix 1 indicates that coal cargoes may emit methane and are subject to oxidation, leading to the depletion of oxygen within cargo hold spaces. Further, IMSBC Code Regulation 3.2.4 requires that appropriate procedures be followed (taking into account the recommendations in IMO Resolution A.1050(27) “Revised recommendations for entering enclosed spaces aboard ships”) prior to entering enclosed spaces. Specifically, Section 6.3.3 of Resolution A.1050(27) states that the atmosphere of the space should be tested to ascertain if acceptable levels of oxygen are present.

10. The Deck Cadet proceeded with photographing the cargo holds (see Figure 4). The OS reported that, as the Deck Cadet prepared to enter Cargo Hold No. 3, he reminded him that it would be unsafe to enter without using a SCBA. The OS also reported that the Deck Cadet's response was that SCBA equipment was unnecessary.⁴



Figure 4: Example of a photograph taken by the Deck Cadet of an Australian ladder.

11. The Deck Cadet continued to enter additional cargo holds using the Australian ladders. At approximately 1640, the Deck Cadet exited Cargo Hold No. 5 and informed the OS that the battery in his camera had lost charge. The Deck Cadet then proceeded to the Engine Room and obtained the engine room camera. During this time, the OS, who had been assisting the Deck Cadet, requested the Bosun to grant him early shore leave. The Bosun agreed and assumed the OS's responsibilities. However, he was not aware of the OS's specific duties in relation to the cargo hold inspections. Subsequently, after being advised that the Bosun would be providing coverage for the OS, the C/O granted the OS's request for shore leave.
12. At approximately 1700, the Deck Cadet met with the C/O and provided him with all photographs that he had taken up to that point. The Deck Cadet informed the C/O that he would continue to photograph the remaining cargo holds, including Cargo Holds Nos. 6 and 7, with the camera that had been obtained from the Engine Room.
13. At approximately 1740, the C/O contacted the Bosun via portable radio and requested that he locate the Deck Cadet who was not responding to portable radio calls. The Bosun went to the cross-deck area between Cargo Hold Nos. 6 and 7 and found the access hatch for the Australian ladder of Cargo Hold No. 6 open. A hammer was found lying on the deck near the access hatch. The Bosun looked into the access hatch and shouted for the Deck Cadet but did not receive a response. The Bosun then proceeded to the gangway where he inquired as to whether the on duty Able Seafarer Deck (ASD) had seen the Deck Cadet. The ASD advised that he had not seen the Deck Cadet. The Bosun then returned to the Australian ladder access hatch for Hold No. 6 with a hand torch, entered, and descended the first vertical ladder. At this point, he observed the legs of the Deck Cadet at the top of the Australian ladder. The Bosun immediately exited the access hatch and instructed the ASD to raise the alarm while the Bosun obtained an SCBA.

⁴ Although a "Stop the Work" policy exists on board, it was not exercised by the OS.

At this time, the Bosun also alerted the C/O by portable radio. The general alarm was sounded at approximately 1751.

14. At the time the Deck Cadet entered Cargo Hold No. 6, the hold was partially laden with coal which covered the lower opening of the Australian ladder enclosure (see Figure 5).



Figure 5: Cargo level in Cargo Hold No. 6 at time of entry.

15. As the Bosun returned to Hold No. 6 after obtaining an SCBA, the C/O was entering the access hatch. The Bosun advised the C/O to use an SCBA before entering the access hatch.⁵ The C/O continued into the enclosed space without utilizing the SCBA retrieved by the Bosun.⁶
16. The C/O reported that he immediately located the Deck Cadet seated on the platform at the top of the Australian ladder and that he was breathing irregularly. The C/O stated that he believes he himself lost consciousness shortly after locating the Deck Cadet.⁷
17. At about the same time, the Second Officer (2/O) reached Cargo Hold No. 6 and the Bosun apprised him of the situation. The 2/O directed the Bosun to prepare the necessary rescue equipment. Upon hearing the alarm, other crewmembers including the Master, Electrician, Chief Engineer (C/E), ASD, and Technical Superintendent, proceeded to the cargo hold access hatch.

⁵ Another “Stop the Work” opportunity which was not effective in preventing the unsafe action.

⁶ Following the incident, the C/O stated that he did not consider the cargo holds as enclosed spaces as the cargo hatches had been open greater than 24 hours and there were longshoremen working in the holds. Further, the C/O said that he was not aware that the Australian ladder was of the enclosed type, attributing this to the fact that all previous bulk carriers that he served on had open type Australian ladders. It is noted that the IMSBC Code Section 3.2.4 provides a warning which reads “...after a cargo space has been tested and generally found to be safe for entry, small areas may exist where oxygen is deficient...”

⁷ Crewmembers report that the C/O was found several steps down the Australian ladder with his shoulders caught on the railing. There were no direct witnesses to the C/O’s loss of consciousness, however, it is presumed that he fell down the Australian ladder until he became caught on the railing stanchion.

- At approximately 1800, the Electrician, after donning an SCBA, entered the Cargo Hold No. 6 Australian ladder access hatch. Shortly after entering, the Electrician requested additional lighting and an Emergency Escape Breathing Device (EEBD) from crewmembers on deck. After obtaining these items, the Electrician fitted the EEBD onto the Deck Cadet and ensured that it was operating properly. The Electrician reported that he observed the C/O unconscious and laying further down on the Australian ladder (see Figure 6).

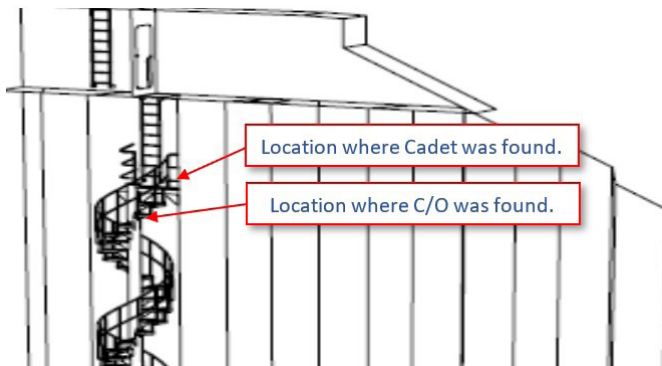


Figure 6: Locations of the C/O and Deck Cadet when they were found.

- The C/E and ASD, using SCBAs and carrying a safety harness, then entered Cargo Hold No. 6 Australian ladder access hatch. At about the same time, the Electrician's SCBA low air pressure alarm activated, and he exited the space. The Electrician then returned after replacing his air cylinder.
- The C/E and ASD assisted the Deck Cadet while the Electrician went to assist the C/O. The Electrician lifted the C/O by the shoulders and positioned his face below a portable air blower duct which had been lowered through the access hatch by crewmembers on the Main Deck.
- Because the location of the Deck Cadet did not allow for the use of a stretcher, the ASD secured him into a safety harness. At approximately 1830, the Deck Cadet was lifted out of the hold by crewmembers on deck. It is reported that the Deck Cadet was unresponsive with irregular breathing upon removal from the space. Cardiopulmonary Resuscitation (CPR) and medical oxygen were immediately administered. At this time, the low air pressure alarm on the C/E's SCBA sounded and he exited the cargo hold in order to change his air cylinder.
- The ASD and Electrician then carried the C/O up approximately four steps to the second landing. At about this time, the C/O regained consciousness and was able to climb the rest of the way out with assistance from the ASD and Electrician. At approximately 1835, the C/O exited the access hatch along with the ASD, Electrician, and C/E, who had again reentered the space after replacing the air cylinder on his SCBA set.
- At 1840, an ambulance arrived alongside the ship. The C/O and Deck Cadet were immediately disembarked and transported to the port hospital.

24. At approximately 1900, the Master was informed by telephone that the C/O was in stable condition, but the Deck Cadet was deceased. Local medical authorities determined the cause of death of the Deck Cadet to be asphyxia.

Crew Experience

25. LA DONNA I's crew consisted of 22 officers and ratings, which was six more than required by the Minimum Safe Manning Certificate issued by the Administrator. All of the officers and ratings held valid Republic of the Marshall Islands issued seafarer documentation.
26. The Master had been sailing for 11 years with seven years' experience on bulk carriers, of which approximately two years were as Master. He had been employed by the Company for five and a half years and had been on board for approximately four and a half months.
27. The C/O had been sailing for seven years, entirely on bulk carriers, of which almost ten months were as C/O. He had been employed by the Company for seven and a half months and had been on board for 13 days.
28. The 2/O had been sailing for five years, with one years' experience on bulk carriers, and serving one year as 2/O. He had been employed by the Company for approximately one year and been on board for 13 days.
29. The Third Officer (3/O) had been sailing for two years, of which one year was as 3/O. He had eight months' experience on bulk carriers. He had been employed by the Company for one year and been on board for approximately three and a half months.
30. The Bosun had been sailing for 19 years, of which 10 years were as Bosun. He had sailed on bulk carriers for five years. He had been employed by the Company for almost 15 years and on board for three and a half months.
31. The OS had been sailing for two years and had over nine months' experience on bulk carriers, of which six months were as an OS. He had been employed by the Company for four and a half months, all on board this ship.
32. The Deck Cadet had been sailing for just over one year, with four and a half months on bulk carriers. All of his experience was as a Deck Cadet. He had been employed by the Company for just over one year and on board for three and a half months.
33. The Administrator did not observe any 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 (ILO) Maritime Labour Convention, 2006 (MLC, 2006), Regulation 2.3.

Safe Work Procedures and Emergency Readiness

34. 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 Safety Management System (SMS) provided procedures for shipboard tasks that included requirements for the use of personal protective equipment (PPE), conducting pre-task hazard assessments, pre-task briefing (also known as "Toolbox

Talks”), and the issuance of a Permit to Work when conducting various shipboard tasks, including enclosed space entry.

35. On 14 August 2018 (prior to the time of the incident), an Enclosed Space Entry Permit had been completed for entry into the emergency fire pump room for routine inspection. The Technical Superintendent and C/O signed the form as entrants, which was then approved by the Master. Prior to this entry, sampling of the atmosphere for oxygen and flammable vapor concentrations was conducted.
36. A Toolbox Talk had not been conducted, nor was an Enclosed Space Entry Permit issued, prior to any crewmembers entering the ship’s cargo holds. Additionally, the C/O did not formally review the hazards associated with entering such a space, nor the actions to be taken in order to mitigate any identified hazards.
37. The Company’s SMS required that all access hatches to loaded cargo holds be sealed with a lock until such time that the C/O grants permission for entry. It is likely that the access hatches to the loaded cargo holds were not locked, as evidenced by the Cadet’s entry into Cargo Hold No. 6 without the C/O’s knowledge.
38. During the laden voyage, atmospheric measurements of the cargo holds were taken daily as required by the IMSBC Code and the Company’s SMS.⁸ Oxygen levels within all seven cargo holds were found to be decreasing with time (see Figure 7). IMO recommendations for oxygen concentration acceptable for entry into enclosed spaces is 21%.⁹ The Company’s SMS requires that oxygen concentrations be maintained between 20.5% and 21%, with the desired being noted as 20.8%.

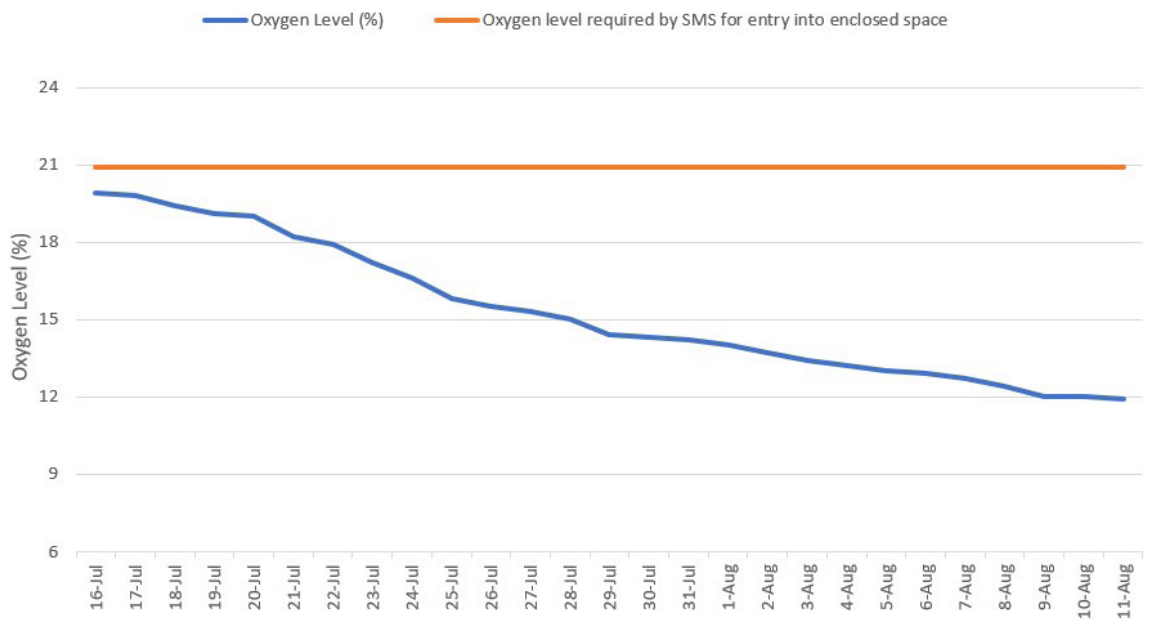


Figure 7: Cargo Hold No. 6’s oxygen levels during this loaded voyage.

8 Readings were recorded daily by the C/O while underway from 16 July 2018 to 11 August 2018. IMSBC Code Appendix 1 schedule for “COAL” requires that atmospheric monitoring of unventilated cargo holds containing coal be monitored for oxygen, flammable gas, and carbon monoxide at least once per day.

9 IMO Resolution A.1050(27) “Revised Recommendations for Entering Enclosed Spaces Aboard Ships.”

39. It was reported that the Deck Cadet was warned by the OS that a SCBA was required for safe entry into the Australian ladder trunk, to which the Deck Cadet responded it was not necessary as he had already entered another similar space along with the C/O. It is also reported that the Bosun warned the C/O to don a SCBA prior to attempting rescue of the Deck Cadet. The C/O reportedly refused and continued into the enclosed space.
40. According to the ship's records, the C/O and Deck Cadet received Safety Familiarization training when they signed on to the ship in accordance with the Company's SMS procedures. It is noted that this familiarization training included notification of the requirement for written permits for entry into enclosed spaces. Both the C/O and Deck Cadet acknowledged their understanding of this policy.
41. The International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS) and the Company's SMS requires that all crewmembers with specific enclosed space entry and rescue responsibilities participate in an enclosed space entry and rescue drill at least once every two months.¹⁰ The last enclosed space entry and rescue drill was conducted on 23 June 2018, prior to the C/O joining the ship.
42. Once the alarm was raised after the discovery of the Deck Cadet, all available crewmembers proceeded to the Cargo Hold No. 6 access hatch with the necessary equipment to carry out an enclosed space rescue.
43. Following the incident, a review of the Australian ladder design was conducted by the ship's Classification Society, Lloyd's Register (LR), which found that they were constructed in accordance with the approved plans and applicable SOLAS requirements.¹¹

PART 3: ANALYSIS

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

SMS

The SMS on board LA DONNA I is comprehensive and includes detailed procedures for entry into loaded cargo holds. Specifically, at least two sections of the SMS designate all loaded cargo holds as "Enclosed Spaces" and require that certain actions be taken prior to entry. These include:

1. issuing of a valid Enclosed Space Entry Permit;
2. completion of a pre-task risk assessment;
3. atmospheric testing within the enclosed space for oxygen levels and the presence of hazardous vapors;
4. a competent person standing at the entrance of the enclosed space; and
5. communication procedures which have been established and tested.

¹⁰ On 21 June 2013, the IMO adopted amendments to SOLAS, Chapter III, Regulation 19, to require that enclosed space entry and rescue drills are performed at least once every two months. This amendment entered into force on 1 January 2015. IMO Resolution MSC.350(92). These drills are to take into account guidance provided in the IMO Resolution A.1050(27) "Revised Recommendations for Entering Enclosed Spaces Aboard Ships". It is noted that these recommendations do not address the well documented reaction by seafarers to immediately enter an enclosed space to assist a fellow crewmember.

¹¹ SOLAS CH. II-1/Regulation 3-6 and IMO Resolution MSC.133(76) Section 3.13.

Earlier in the day on 14 August 2018, an entry was made into the Emergency Fire Pump Room, which is designated as an enclosed space per the SMS. The required “Checklist for Entry into Enclosed Spaces” was properly completed and approved by the Master. The C/O signed the permit as the responsible officer for this operation. Air monitoring was conducted at three locations within the space and the operation was completed with no issues noted. This indicates that the C/O was familiar with the requirement for Enclosed Space Entry Permits and that the SMS was effective.

However, actions required by the SMS were not taken prior to the C/O and Deck Cadet entering the cargo holds to take photographs of the cargo holds and Australian ladders. While preparing for the task, the C/O failed to properly identify the loaded cargo holds and associated Australian ladder trunks as enclosed spaces. He also ignored the painted warning on the access hatches. The C/O stated that he did not consider the cargo holds and associated Australian ladder trunks as enclosed spaces requiring a permit since the cargo hatches had been open for greater than 24 hours and longshoremen were working within the holds.

While a “Stop the Work” policy is included in the Company’s SMS, it was not effectively implemented at the time of the incident. The OS failed to stop the Deck Cadet from entering the Australian ladder trunk when he recognized that additional PPE was required, and the Bosun failed to stop the C/O from entering the cargo hold without utilizing an SCBA.

Hazard Identification and Awareness

Daily oxygen readings were taken within the cargo holds during the laden voyage. These readings indicated a continuous reduction of oxygen concentrations within all holds, and in particular, Cargo Hold No. 6. Three days prior to the incident, Cargo Hold No. 6 was found to contain only 11.9% oxygen, well below the 20.8% oxygen level required by the Company and the 21% oxygen level recommended by IMO. However, there is no indication that this was considered when the C/O made the determination that the enclosed space entry procedures did not need to be followed.

As an added reminder to the crew, each access hatch within the cargo length was marked with the warning “LACK OF OXYGEN” due to the possible presence of a hazardous oxygen deficient. At least some of these hatches, which were entered by the Deck Cadet with the assistance of the OS, were opened just prior to entering. There is also no evidence that these warnings were observed by the C/O prior to entering, and directing the Deck Cadet to enter, the cargo hold ladder trunks.

Cargo Hold Access Arrangements

At the time of the incident, the coal cargo within Cargo Hold No. 6 completely covered the lower opening of the Australian ladder trunk. In addition, the hatch providing access to this space was kept closed until just before entry was conducted. This resulted in a non-ventilated space existing within the Australian ladder trunk even though the cargo hold was open to the atmosphere for the 24 hours leading up to the incident. The Australian ladder trunk maintained an oxygen deficient atmosphere within that enclosed space.

As previously noted, the C/O had stated that all previous ships which he sailed on were fitted with open Australian ladders. Open ladders share a common atmosphere with the rest of the cargo hold, greatly reducing the risk of isolated pockets of hazardous atmosphere from developing. The C/O was not aware that the ship had enclosed Australian ladders nor was he familiar with the unique hazards that this presented. However, it should have been readily apparent that the ladders were located inside an enclosed trunk when the C/O entered the Australian ladder to photograph Cargo Hold No. 1.

Supervision

The C/O indicated to the Deck Cadet which photos were needed while they were in Cargo Hold No. 1. Only the C/O entered the access hatch while the Deck Cadet remained on deck. No instruction was given regarding the hazards associated with entering the Australian ladder trunks while cargo was present in the cargo holds. The C/O then directed an OS to accompany the Deck Cadet. Both individuals continued to take photos of each Australian Ladder and cargo holds without any other supervision or assistance. Later in the day, and without supervision, the Deck Cadet entered Cargo Hold No. 6 alone.

Communications

Portable radios were not used by the Deck Cadet or OS while inspecting the cargo holds. Once the Deck Cadet entered the enclosed space, there was no direct communication with the OS on the Main Deck. Further, the Deck Cadet did not possess a portable radio when he entered Cargo Hold No. 6 without any standby assistance or crew knowledge of his entry. He therefore had no means of urgent communication with his fellow crewmembers in the event of injury or other issue.

The OS was assigned by the C/O to assist the Deck Cadet with photographing the remaining cargo holds. Prior to completion of photographing all the holds, the OS requested that the Bosun assume his duties so that he could be granted shore leave. The Bosun agreed to assume the OS's duties. The OS was subsequently granted shore leave by the C/O. It is reported that the OS did not make the Bosun aware that he was assisting the Deck Cadet with the cargo hold inspections. Although the Deck Cadet spoke with the OS and Bosun prior to proceeding to Cargo Hold No. 6, no request for assistance is reported to have been made by the Deck Cadet.

Enclosed Space Rescue Procedures

SOLAS requires that "crew members with enclosed space entry or rescue responsibilities shall participate in an enclosed space entry and rescue drill to be held on board the ship at least once every two months." This requirement was incorporated into the Company's SMS. Training and drills had been conducted with the crew and properly documented within the two months prior to the incident. However, the C/O had not participated in an enclosed space rescue drill since joining LA DONNA I 13 days earlier.

When the Deck Cadet could not be reached on the portable radio, the Bosun entered the Cargo Hold No. 6 Australian ladder access hatch without wearing an SCBA or complying with the Company's enclosed space entry requirements detailed in the SMS. Upon receiving notification from the Bosun that the Deck Cadet was found incapacitated, the C/O also immediately entered the space without the use of an SCBA and without complying with the enclosed space rescue procedures. The immediate response to enclosed space incidents

without following established safety procedures is not unique to this incident. Unfortunately, the desire to assist fellow crewmembers often results in a seafarer entering an enclosed space to affect a rescue without adhering to proper safety precautions.¹²

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. The causal factors that contributed to the Deck Cadet's loss of life include:
 - (a) asphyxiation due to insufficient oxygen levels within the space where he was working;
 - (b) the C/O's failure to properly identify the Australian ladder trunk as an enclosed space when he entered, and subsequently directed the Deck Cadet to enter, the cargo holds;
 - (c) the failure of the C/O to identify the potential hazards despite the warning statement present on each access hatch cover;
 - (d) the failure of the Deck Cadet to follow the OS's advice that a SCBA should be used when entering the enclosed trunk;
 - (e) the failure of the Deck Cadet to identify the potential hazards despite the warning statement present on each access hatch cover; and
 - (f) the C/O's failure to follow and enforce enclosed space entry and rescue procedures.

2. Additional causal factors which likely contributed to the Deck Cadet's loss of life include:
 - (a) lack of familiarity with ship design characteristics in relation to design of the enclosed Australian ladders within the cargo holds;
 - (b) inadequate onboard implementation of pre-task risk identification, assessment, and control procedures;
 - (c) inadequate supervision of trainee crewmembers during high-risk or non-routine work assignments;
 - (d) ineffective communication amongst crewmembers related to the transfer of duties and responsibilities;
 - (e) delays in effecting a properly organized rescue of the Deck Cadet due to the C/O attempting a rescue alone and without the proper equipment; and
 - (f) ineffective onboard implementation of "Stop the Work" policy when crewmembers observed unsafe actions or conditions.

¹² It is noted there were similar incidents on board two other Republic of the Marshall Islands-registered ships in 2017 and 2018. Similar incidents are known to have also occurred on ships registered under other flags.

PART 5: PREVENTIVE ACTIONS

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

1. All managed ships having similar enclosed Australian ladder designs were identified, and ship-specific entry plans developed.
2. Within 24 hours, a safety alert was sent to all managed ships which detailed the findings and lessons learned from the incident. In addition, all ships carrying coal were reminded of the requirement to keep access hatches for loaded cargo holds locked.
3. The Classification Society was requested to review the Australian ladder design and recommend modifications to increase ventilation of the enclosed areas.
4. For ships fitted with enclosed type Australian ladders, an overview of the design will be added to initial crewmember orientation.
5. Safety training was conducted for all crewmembers regarding the precautions to be taken when entering the enclosed Australian ladders for the cargo holds.
6. All superintendents will be provided with the findings and lessons learned for their awareness and for use as a training aid on board their ships.

Additionally, the Administrator has taken the following action:

1. Issued Marine Safety Advisory (MSA) 23-18 on 30 August 2018 reporting preliminary findings based on the Administrator's marine safety investigation of the enclosed space entry incident that occurred on board LA DONNA I and ones that occurred on board other Republic of the Marshall Islands-registered ships. The MSA also included recommendations for ship managers and Masters regarding enclosed space entry and enclosed space rescue procedures.

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 its "Stop the Work" policy and take positive steps to encourage appropriate use of this policy on board managed ships via additional crew training, crew seminars, and other appropriate measures. It is further recommended that this incident be used as a practical case study in such training.

2. Due to the similarity of this incident with other recent incidents occurring on Republic of the Marshall Islands-registered ships, the previous safety recommendation for the Administrator related to enclosed space entry training is reaffirmed.¹³

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

¹³ See the Administrator's HALLAM Casualty Investigation Report issued on 25 February 2019. The issued safety recommendation reads "taking into consideration the preventative actions that have been taken by the Company and the Administrator, it is recommended that the Administrator consider submitting a proposal to the IMO to amend resolution A.1050(27) to include a recommendation that shipboard enclosed space entry training addresses that the best way for a seafarer to assist a fellow seafarer inside an enclosed space is not to enter the space, but to immediately raise the alarm so that an organized rescue can be conducted in accordance with established procedure."