REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

DS SOFIE BULKER CASUALTY INVESTIGATION REPORT

Fatal Fall from Height

South Atlantic Ocean | 12 April 2021

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DISCLAIMER

In accordance with national and international requirements, the Republic of the Marshall Islands Maritime Administrator (the "Administrator") conducts marine safety investigations of marine casualties and incidents to promote the safety of life and property at sea and to promote the prevention of pollution. Marine safety investigations conducted by the Administrator do not seek to apportion blame or determine liability. While every effort has been made to ensure the accuracy of the information contained in this Report, the Administrator and its representatives, agents, employees, or affiliates accept no liability for any findings or determinations contained herein, or for any error or omission, alleged to be contained herein.

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

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

2/O	Second Officer
3/O	Third Officer
AED	Automatic External Defibrillator
ASD	Able Seafarer Deck
C/O	Chief Officer
cm	Centimeter
COVID-19	Coronavirus Disease 2019
CPR	Cardiopulmonary Resuscitation
ISM Code	International Safety Management Code
m	Meters
MLC, 2006	Maritime Labour Convention, 2006
PPE	Personal Protective Equipment
SMS	Safety Management System
STCW Code	Seafarers' Training, Certification and Watchkeeping Code
UTC	Coordinated Universal Time

PART 1: EXECUTIVE SUMMARY

On 12 April 2021, the Republic of the Marshall Islands-registered bulk carrier DS SOFIE BULKER, managed by Dramar Denizcilik Ticaret A.S. (the "Company"), was underway in the South Atlantic Ocean. The ship was on a ballast voyage from Matadi, Democratic Republic of the Congo (hereinafter "Congo") to Santos, Federative Republic of Brazil (hereinafter "Brazil").

Cargo hold cleaning needed to be completed before loading. That day, the Boson, ASD1, and ASD2 were gathering cargo residue from the tank top of Cargo Hold No. 2. At about 1730,[1] they heard a shout followed quickly by a loud noise. When they turned, they found the C/O lying on the tank top motionless. He was directly below the upper platform of the Australian ladder of Cargo Hold No. 2.

The ASD1 and ASD2 immediately notified other crewmembers using a portable radio and checked the C/O. He was unresponsive but had a pulse. The 2/O and 3/O went to the cargo hold with the necessary first aid equipment while the Master requested telemedical advice. At about 1808, the C/O no longer had a pulse and CPR was immediately started. CPR was stopped and the C/O was determined to be deceased at 1906.

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

An autopsy performed in Brazil determined that the C/O died due to cranial-encephalic trauma and polytraumatic injury by blunt force after falling from height. It is presumed that the C/O fell from the upper platform of the Australian ladder; however, this was not witnessed by anyone nor was the C/O seen immediately before his unwitnessed fall.

The marine safety investigation conducted by the Republic of the Marshall Islands Maritime Administrator (the "Administrator") identified the following:

1. The cause of the C/O's unwitnessed fall cannot be definitively determined.

2. Causal factors that may have contributed to this very serious marine casualty include:

   (a) slipping or losing balance while leaning over the rail of the Australian ladder's upper platform in Cargo Hold No. 2; or

   (b) falling or losing balance while descending the vertical ladder from the main deck to the upper platform and subsequently falling over the railing.

PART 2: FINDINGS OF FACT

The following Findings of Fact are based on the information obtained during the Administrator's marine safety investigation. Due to travel restrictions imposed in response to the COVID-19 pandemic, the Administrator was not able to arrange for onboard attendance as part of its marine safety investigation of this very serious marine casualty. All related information available to the Administrator was obtained remotely.

1. Ship particulars: *see* chart on page 10.

2. DS SOFIE BULKER is a bulk carrier with five cargo holds that have folding hatch covers.

3. At about 1100 on 7 April 2021, DS SOFIE BULKER departed Matadi, Congo. The ship was in ballast and bound for Santos, Brazil. Cargo hold cleaning was required to be completed during the voyage.

4. On 9 April 2021, the C/O completed a risk assessment for hold cleaning operations which identified "Falls – slip or trip" as the sole risk associated with this task. It also identified the use of a safety harness while on the bottom vertical section of the Australian ladder as an adequate control of this risk. The Master approved the risk assessment.

5. Cargo hold cleaning was conducted, without incident, on 9, 10, and 11 April 2021. The work involved the entire deck crew.

6. On 12 April 2021, the C/O assigned the Bosun, ASD1, and ASD2 to continue cleaning in Cargo Hold No. 2. The crewmembers were to use hand tools to remove debris from the previous cargo, bagged rice, that remained on the tank top. Working from height was not planned as part of the hold cleaning.

7. Before starting the work, the C/O conducted a toolbox talk with the Bosun, ASD1, and ASD2. The previously completed risk assessment was reviewed, including the safe work practices to be followed, crewmembers assigned, tools to be used, and the PPE required.

8. The weather on 12 April 2021 was reported as a gentle breeze with a southwesterly swell of 2 m. It was reported that the ship was not excessively rolling or pitching.

9. The C/O gave permission to start cleaning Cargo Hold No. 2 at about 0815. The Bosun, ASD1, and ASD2 then entered the hold.

10. ASD1 and ASD2 were at the aft end of Cargo Hold No. 2 collecting cargo residues from the tank top. The residues were being placed into buckets for later hauling up to the main deck.

11. At about 1730, ASD1 and ASD2 heard someone shout, followed immediately by a loud noise. They turned to find the C/O lying motionless on the tank top, about 3 m forward of the aft bulkhead and in line with the upper platform of the aft access ladder *(see Figure 1)*.

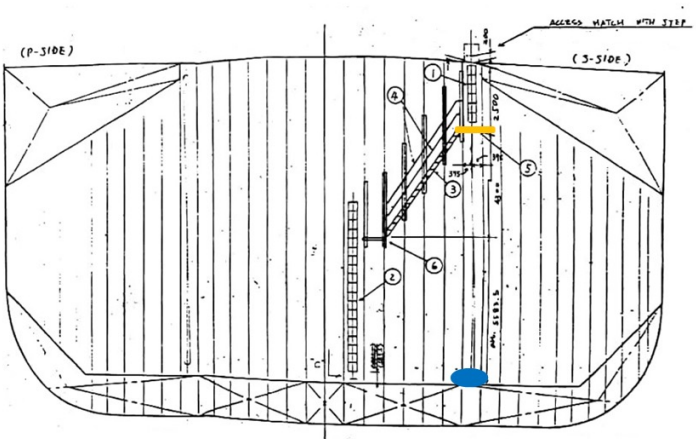

Figure 1: Schematic of the aft bulkhead and Australian ladder of Cargo Hold No. 2. The C/O's location following his unwitnessed fall is marked in blue and the upper platform in yellow.

12. The C/O was not seen immediately before his unwitnessed fall.

13. The ASD1 and ASD2 immediately notified the Master, who was on the Bridge, using a portable radio and then checked the C/O. He was unresponsive but had a pulse. They also observed that he was bleeding from his nose and ears.

14. The 2/O and 3/O were in the Officer's Messroom when they heard the report that the C/O was injured. The 3/O went directly to the cargo hold while the 2/O first retrieved a first aid kit, medical oxygen, and an AED from the ship's Hospital.

15. When the 3/O arrived, he found the C/O to be unresponsive. The 2/O arrived shortly after and checked the C/O's vital signs. He was breathing and his pulse was very elevated. The 2/O

VESSEL PARTICULARS

Vessel Name
DS SOFIE BULKER

Registered Owner
Sofie International SA

ISM Ship Management
Dramar Denizcilik Ticaret A.S.

Flag State
Republic of the Marshall Islands

IMO No.	Official No.
9310604	6829
Call Sign	**Year of Build**
V7RB8	2007

Length x Breadth x Depth
170.1 x 26.0 x 13.6 m

Gross Tonnage	Net Tonnage
17,663	10,133

Vessel Type
Bulk Carrier

Document of Compliance Recognized Organization
ClassNK

Safety Management Certificate Recognized Organization
ClassNK

Classification Society
ClassNK

Persons on Board
21

informed the Master of the C/O's condition and placed a neck brace on him. Medical oxygen was also administered. At the same time, the Master requested telemedical advice.

16. At about 1808, the C/O no longer had a detectable pulse and CPR was immediately started. Following advice from the shore side medical authority, the C/O was administered adrenalin and an AED was used.

17. Despite the crew's lifesaving efforts, CPR was stopped and the C/O was determined to be deceased at 1906.

18. The C/O was removed from the hold and disembarked on the ship's arrival at Santos on 27 April 2021. Medical authorities in São Paulo, Brazil performed an autopsy. The coroner determined that the C/O died due to cranial-encephalic trauma and polytraumatic injury by blunt force after falling from height.

PPE

19. At the time of his unwitnessed fall, the C/O was wearing a boiler suit, safety shoes, safety gloves, and a safety helmet. All of the PPE worn by the C/O was reported to be in good condition.

Cargo Hold No. 2 Aft Access Ladder

20. The aft access ladder of Cargo Hold No. 2 is an Australian ladder consisting of two sections of vertical ladder connected by landings and an inclined ladder *(see Figure 2)*. The ladder is located on the aft bulkhead, starboard of the centerline.

Figure 2: Photo of the Australian ladder of Cargo Hold No. 2.

21. The upper section of vertical ladder is 3.1 m long extending from the main deck access to the upper platform inside the hold. This upper platform is 73 cm x 73 cm and about 10.8 m above the tank top *(see Figure 3)*.

Figure 3: Photo of the upper platform of the Australian ladder for Cargo Hold No. 2, taken from the main deck access hatch.

22. A two-tier guard rail protects the forward side of the platform and extends down the inclined section of ladder. The rails are constructed of 15.5 cm wide flat steel bars, with a 30 cm opening below the lower rail and between the two rails. The top of the upper rail is 100 cm above the platform.

23. The vertical ladder from the main deck to the upper platform is attached to the aft bulkhead, between two vertical frames.

24. The section of vertical ladder between the top of the platform railings and the access hatch was unguarded.

25. Following the incident, the upper platform was found to be clean and free of debris.

SMS

26. The Company's SMS requires completing a risk assessment before conducting cargo hold cleaning. This was completed on 9 April 2021.

27. The Company's SMS also includes requirements for daily work planning. Among other items, it is required that a toolbox talk be completed each day prior to work starting. The toolbox talk should cover the following topics:

    (a) scope of the planned work;

    (b) crewmember responsible for the work;

    (c) crewmember responsible for monitoring safety;

    (d) safeguards that must be in place;

    (e) identification and discussion of the needed tools; and

    (f) review of the permit to work (if one is required).

28. A toolbox talk was conducted each day before hold cleaning started, including on the day of the incident.

29. The SMS also details the PPE required to be worn while working on board. It requires that a boiler suit, safety helmet, safety shoes, and work gloves be worn while cleaning the cargo holds from the tank tops.

30. The use of a safety harness is required by the SMS when the work involves the risk of a fall. A specific height is not used to determine if a task requires the use of a safety harness. Instead, the hazards associated with the task are the basis for determining if a fall risk exists and a safety harness is required. The SMS does not require the use of a safety harness while ascending or descending an Australian ladder.

31. The Company's SMS provides the authority for any crewmember, regardless of rank or position, to take action to stop unsafe work or actions. The SMS also provides the authority for crewmembers to refuse work that is believed to be unsafe until the task is reviewed and ensured to be safe.

32. All crewmembers are required to complete a comprehensive initial familiarization training on joining DS SOFIE BULKER. Topics covered by the familiarization training include emergency procedures and responsibilities, familiarization with the Company's SMS, PPE requirements, and the crewmember's specific duties and responsibilities. Records indicate that the C/O completed this required familiarization training.

DS SOFIE BULKER Crew

33. DS SOFIE BULKER had 21 crewmembers, six more than required by the Minimum Safe Manning Certificate issued by the Administrator.

34. All involved crewmembers held the appropriate Republic of the Marshall Islands-issued seafarer documentation for their positions.

35. The Administrator did not find any indication that any crewmembers involved with this incident failed to receive the amount of rest mandated by the STCW Code, Section A-VIII/1, paragraphs 2 and 3, and the MLC, 2006, Regulation 2.3.

36. The C/O's experience was:

TIME ON BOARD DS SOFIE BULKER	TIME IN RANK	TIME WITH COMPANY	TOTAL TIME AT SEA
32 days	2 years, 2 months	32 days	6 years, 8 months

37. The C/O previously sailed on several bulk carriers in capacities from Deck Cadet to C/O, including six contracts on five different Republic of the Marshall Islands-registered ships.

38. The C/O's most recent medical examination was conducted on 18 September 2020. He was found fit for full duty without any restrictions.

39. The C/O was reported to be 190 cm tall.

PART 3: ANALYSIS

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

Fall from Height

The C/O's fall was not witnessed by any crewmembers, nor was he seen immediately beforehand. The first indication was a shout heard by crewmembers working in Cargo Hold No. 2, followed quickly by a loud noise. The crewmembers turned to see the C/O lying motionless on the tank top. He was in line with the upper platform of the Australian ladder and about 3 m forward of the aft bulkhead. Based on the location where the C/O landed, it is presumed that he fell about 10.8 m from either the vertical access ladder or the upper platform of the Australian ladder. The determined cause of death is consistent with a fall from this height.

The upper platform railing is 100 cm high. The distance between the top of this railing and the overhead transverse beam is 144 cm. The railing for the upper platform is 72 cm from the aft bulkhead (and the vertical ladder from the main deck). With the C/O reported as being 190 cm tall and the railing 100 cm above the platform, almost half of the C/O's body would have been above the railing. It is not known what caused his unwitnessed fall from the area of the upper platform. It is possible that he lost his balance while climbing down the vertical ladder and fell backwards over the railing. However, it is also possible that he fell while standing on the platform and possibly attempting to look over the railing at the crew working beneath. This could happen if his feet were to slip or if he lost his balance.

The platform was found to be clean and clear of debris when inspected following the incident. Additionally, the Australian ladder was designed and constructed in accordance with relevant requirements. Therefore, the ladder or platform condition is not considered a causal factor of this incident.

C/O Experience

At the time of the incident, the C/O had only been on board DS SOFIE BULKER for 32 days. However, he had nearly seven years of shipboard experience, with two of those as a C/O. The C/O had also completed the required initial onboard familiarization training upon joining the ship.

Before joining DS SOFIE BULKER, the C/O sailed on numerous bulk carriers during his career at sea. Using Australian ladders to enter and exit cargo holds is a common task on bulk carriers and the C/O would have likely done this regularly. A lack of experience or knowledge is not considered a causal factor of this incident.

PPE

The Company's SMS details the PPE that must be worn for specific tasks. Specifically, it requires that a boiler suit, safety helmet, safety shoes, and work gloves be worn while cleaning the cargo holds from the tank tops. Using a safety harness and lifeline is only required by the SMS when the planned work involves the risk of falling from height. The crewmembers were collecting cargo residues from the tank top at the time of the C/O's unwitnessed fall, which did not include working from height. Additionally, the Company's SMS does not require the use of a safety harness while ascending or descending Australian ladders. Therefore, the C/O was not required by the SMS to wear a safety harness. The lack of or improper use of PPE is not considered a causal factor of this incident.

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 cause of the C/O's unwitnessed fall cannot be definitively determined.

2. Causal factors that may have contributed to this very serious marine casualty include:

   (a) slipping or losing balance while leaning over the rail of the Australian ladder's upper platform in Cargo Hold No. 2; or

   (b) falling or losing balance while descending the vertical ladder from the main deck to the upper platform and subsequently falling over the railing.

PART 5: PREVENTIVE ACTIONS

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

1. The lessons learned were circulated to all ships in the Company's managed fleet.

2. The Company has increased the frequency of onboard audits and strengthened the oversight of ships in the Company's managed fleet to ensure the effectiveness of the risk assessments conducted on board.

3. All manholes and access hatches leading to ladders were marked with a reminder that three points of contact must be maintained at all times when ascending and descending ladders.

4. The Company implemented a policy requiring that toolbox talk forms and permits to work be signed by all involved crewmembers.

PART 6: RECOMMENDATIONS

Based on the above Conclusions and in consideration of the Preventive Actions taken, the Administrator has no Recommendations.

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