



REPUBLIC OF THE MARSHALL ISLANDS

Maritime Administrator

BLUE CECIL MARINE SAFETY INVESTIGATION REPORT

Multiple Fatalities During Enclosed Space Entry

South China Sea | 8 December 2023

Official Number: 9420

IMO Number: 9300207



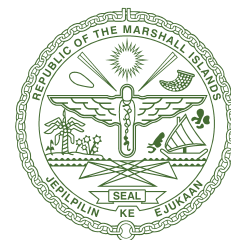
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AUTHORITY

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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LIST OF ABBREVIATIONS AND ACRONYMS

2/E	Second Engineer
3/E	Third Engineer
C/E	Chief Engineer
C/O	Chief Officer
CPR	Cardiopulmonary Resuscitation
ETO	Electro Technical Officer
ILO	International Labour Organization
IMO	International Maritime Organization
m	Meters
MSA	Marine Safety Advisory
MT	Metric Tons
No.	Number
OOW	Officer of the Watch
P	Port
PA	Public Address
QHSE	Quality, Health, Safety, and Environment
SCBA	Self-contained Breathing Apparatus
SMS	Safety Management System
TST	Top Side Tank
US NIOSH	United States National Institute for Occupational Safety and Health
UTC	Universal Coordinated Time

DOCUMENTS CITED

IMO Resolution A.1050(27)	IMO Assembly Resolution on Revised Recommendations for Entering Enclosed Spaces Aboard Ships
IMO Resolution MSC.133(76)	IMO Marine Safety Committee Resolution on Adoption of Technical Provisions for Means of Access for Inspections
ISM Code	International Management Code for the Safe Operation of Ships and for Pollution Prevention
MLC, 2006	Maritime Labour Convention, 2006
MSA No. 03-24	Enclosed Space Entry Incidents
SOLAS	International Convention for the Safety of Life at Sea, 1974
STCW Code	Seafarers' Training, Certification and Watchkeeping Code



PART 1: EXECUTIVE SUMMARY

On the afternoon of 8 December 2023, the Republic of the Marshall Islands-registered BLUE CECIL was underway in the South China Sea. All cargo holds were laden with scrap metal. Work being done on deck included the C/E, ETO, and Fitter repairing a corroded electrical junction box located on the port side of the cross deck between Cargo Holds Nos. 1 and 2 while the Bosun and deck ratings were painting the main deck on the starboard side.

Prior to the afternoon coffee break, the C/E told the Bosun he was going to enter Cargo Hold No. 1 to get a welding cable and some other tools that had previously been left inside the cargo hold. The Bosun told the C/E that it was dangerous and that they should get permission from the Master before entering the cargo hold. The C/E replied they would go inside the cargo hold later. The Bosun observed the Fitter opening the booby hatch for Cargo Hold No. 1 as he and the C/E were talking. The Bosun reported smelling a strong odor after the booby hatch was opened.

The Bosun and deck ratings resumed work on deck after the coffee break. From where they were on deck, they were not able to see where the C/E, ETO, and Fitter had been working on the electrical junction box before the coffee break. The 2/E did not see the C/E, ETO, or Fitter and did not look for them when he went out on deck to check on the work being done on the electrical junction box after the coffee break was over. While in the Changing Room at the end of the workday, the Bosun determined that no one had recently seen the C/E, ETO, or Fitter.

The Bosun went out on deck with a flashlight and after not seeing the C/E, ETO, or Fitter on deck, he entered Cargo Hold No. 1 without telling the OOW or wearing an SCBA. While on the vertical ladder leading from the main deck to the upper platform, the Bosun saw light reflect from what he presumed were reflective patches on the missing crewmembers' coveralls as he scanned with his flashlight. He went back on deck, raised the alarm, and then started removing the cleats for the cargo hold hatch cover so that it could be opened. A rescue was conducted per the ship's enclosed space entry rescue plan and the C/E, ETO, and Fitter were removed from Cargo Hold No. 1 without further incident. All three were unresponsive when removed from the cargo hold. They did not respond to CPR and were subsequently determined to be deceased.

The Republic of the Marshall Islands Maritime Administrator's (the "Administrator's") marine safety investigation determined that the C/E, ETO, and Fitter had entered Cargo Hold No. 1 to recover the welding cable and other tools

without complying with the Company’s enclosed space entry procedures despite the Bosun’s prior warning to the C/E that it was dangerous and required permission from the Master.

The following lessons learned were identified:

- (a) Entering a loaded cargo hold without authorization and without following established shipboard enclosed space entry and rescue procedures is extremely hazardous and should not be attempted.
- (b) Physical boundaries are critical for preventing unauthorized access into an enclosed space.
- (c) Enclosed space rescue procedures must be properly practiced and drills conducted as if they were a real emergency.
- (d) Stop-work authority can prevent marine casualties. For stop-work authority to be effective, crewmembers must not only be aware that they have this authority, but they must also have confidence that the authority is non-negotiable and can be exercised without fear of repercussion. They must also be as familiar with how to issue and respond to a stop-work action or instruction as they are with their other shipboard duties.

PART 2: FACTUAL INFORMATION

The following Factual Information is based on the information obtained during the Administrator’s marine safety investigation.

Ship particulars at the time of the incident: *see* chart to right.

Narrative

The geared, five-hatch, bulk carrier BLUE CECIL (*see Figure 1*) departed Portland, Oregon, United States of America on 12 November 2023 laden with 31,085.9 MT of scrap metal.¹ The planned discharge port was Chittagong, People’s Republic of Bangladesh. The ship was managed by Opal Ship Management Pte Ltd (hereinafter the “Company”).

¹ Scrap metal is an oxygen depleting cargo. *See* IMO Resolution A.1050(27), section 10.5.13.

SHIP PARTICULARS

Vessel Name

BLUE CECIL

Registered Owner

Good Highlander (MI) Ltd

ISM Ship Management

Opal Ship Management Pte Ltd

Flag State

Republic of the Marshall Islands

IMO No.

9300207

Official No.

9420

Call Sign

V7A4708

Year of Build

2004

Gross Tonnage

19,885

Net Tonnage

11,140

Deadweight Tonnage

32,564

Length x Breadth x Depth

169.4 x 28.4 x 14.2 m

Ship Type

Bulk Carrier

Document of Compliance

Recognized Organization

Nippon Kaiji Kyokai

Safety Management Certificate

Recognized Organization

Nippon Kaiji Kyokai

Classification Society

Nippon Kaiji Kyokai

Persons on Board

20

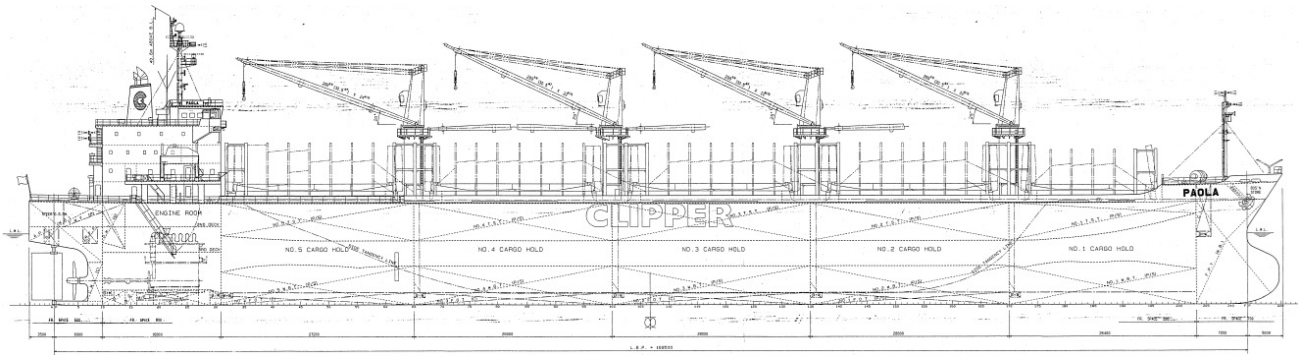


Figure 1: BLUE CECIL General Arrangement.

On the morning of 30 November 2023, the ship's C/O, C/E, and Fitter entered Cargo Hold No. 1 to repair a pinhole leak that had previously been observed in way of the No. 1 P TST. Prior to their entering the cargo hold, it had been ventilated by opening the hatch covers, the atmosphere was tested, and an Enclosed Space Entry Permit was issued as required by the Company's enclosed space entry procedures. The ship's C/E was responsible for monitoring the operation.

The work was completed that same day before the coffee break. The hatch covers and access hatch for Cargo Hold No. 1 were closed after the C/O, C/E, and Fitter left the cargo hold and the Enclosed Space Entry Permit was closed out. A welding cable and some tools were left behind inside Cargo Hold No. 1 when the C/O, C/E, and Fitter left the cargo hold.²

One week later, on the afternoon of 8 December 2023, the ship was underway in the South China Sea approximately 150 NM off the west coast of the Republic of the Philippines (hereinafter the "Philippines"). Work that was being done on deck included the C/E, ETO, and Fitter who were repairing a corroded electrical junction box located on the port side of the cross deck between Cargo Holds Nos. 1 and 2, while the Bosun and deck ratings were painting the main deck on the starboard side.

The Master called the C/E in his cabin by telephone at 1300³ to make him aware of an email that had been received from the Company. The C/E did not say anything when he spoke with the Master about the work being done on the electrical junction box or about the possibility of entering Cargo Hold No. 1. The Master stated that this was the last time he spoke with the C/E. The C/E went out on deck with the ETO and Fitter after speaking with the Master.

At approximately 1400, the C/E told the Bosun, who was painting a fitting near the electrical junction box, that he was going to enter Cargo Hold No. 1 to get a welding cable and other tools that had been left inside the cargo hold when the leak in way of No. 1 P TST was repaired. The Bosun told the C/E that it was dangerous and that they should get permission from the Master before entering the cargo hold. The C/E replied they would go inside the cargo hold later. The C/E did not elaborate regarding what he meant by "later." The Bosun observed the Fitter opening the booby hatch for Cargo Hold No. 1 as he and the C/E were talking. The Bosun stated he could smell a strong odor

² The 2/E reported having heard the Fitter say something about leaving some welding tools in Cargo Hold No. 1. It could not be determined why the tools were left in the cargo hold.

³ Unless stated otherwise, all times are ship's local time (UTC +8).

after the booby hatch was opened. The C/E, ETO, and Fitter resumed working on the electrical junction and the Bosun resumed painting. They continued working until 1500, when they all stopped for their afternoon coffee break.

The C/E, ETO, and Fitter went to the Engine Control Room and the Bosun went to the Crew's Mess for their coffee break. The 3/E stated that during the coffee break they spoke very little about the ongoing work. He also said that neither the C/E, ETO, or Fitter said anything about going into Cargo Hold No. 1.⁴ The 3/E said that the Fitter left the Engine Control Room after a few minutes and that the C/E and ETO left a short time later.

At 1530, the Bosun went back out on deck and started painting the cross deck between Cargo Holds Nos. 2 and 3 while the other deck ratings resumed painting the main deck starboard side near Cargo Hold No. 2. The Bosun did not tell anyone during coffee break that the C/E had told him that he (i.e., the C/E) planned to enter Cargo Hold No. 1 since he expected that the C/E would speak with the Master.

At 1545, the 2/E went out on deck to check on how the work on the electrical junction box was proceeding and to take pictures for the daily work report. He did not see anyone working on the junction box before going back to the Engine Room.

At 1700, the Bosun and deck ratings stopped work for the day and went aft to the Accommodation. While in the Changing Room, the Bosun asked if anyone had seen the C/E, ETO, or Fitter. None of the crewmembers who were in the Changing Room reported having seen them. The Bosun then took a flashlight and went out on deck to look for the C/E, ETO, and Fitter.⁵

The Bosun did not see anyone on deck as he approached the electrical junction box that the C/E, ETO, and Fitter had been repairing. He saw that the booby hatch for Cargo Hold No. 1 was open and that the welding machine was turned on. He also smelled what he described as fumes coming out of the booby hatch. The Bosun shouted into the booby hatch for the C/E but did not get a response. He then climbed about six steps down the ladder into Cargo Hold No. 1 while holding his breath and saw light reflect from what he presumed were reflective patches on the missing crewmembers' coveralls as he scanned with his flashlight. The Bosun was not wearing an SCBA and had not informed the OOW or any other crewmember before he entered the cargo hold. The Bosun immediately went back out on deck and started shouting "man down" as he ran back to the Accommodation.

At approximately 1735, the C/O, who was on duty on the Bridge, saw the Bosun running toward the Accommodation waving a flashlight and shouting. The C/O could not make out what the Bosun was shouting, so he went out to the Bridge wing and called to the Bosun. The Bosun, who was near Cargo Hold No. 4, reported that three crewmembers were unconscious inside Cargo Hold No. 1. The C/O announced the emergency over the PA system and ordered all crewmembers to muster at Cargo Hold No. 1. The Master and 3/O arrived on the Bridge. After being relieved by the 3/O as the OOW, the C/O went to the Ship's Office to get two gas detectors before going forward to direct the rescue operation.

4 The 2/E stated that there had been no discussion of entering Cargo Hold No. 1 or the need to retrieve the tools that had been left inside the cargo hold during the engineer's morning Toolbox Meeting.

5 The time of sunset was 1736.

After reporting the emergency to the C/O, the Bosun returned forward and started removing the cleats so that the hatch cover could be opened as other crewmembers arrived with SCBAs, a rescue tripod, stretcher, and first aid equipment.

Both gas detectors activated when the C/O checked the atmosphere inside the booby hatch. The C/O directed the Bosun to fully open the hatch covers for Cargo Hold No. 1 and then directed the two ASDs who had donned SCBAs to enter the cargo hold through the booby hatch. By 1747, the two ASDs had located the C/E, ETO, and Fitter lying unconscious at the bottom of the inclined section of the Cargo Hold No. 1 aft access ladder (see Figure 2).



Figure 2: Cargo Hold No. 1 aft access ladder. The vertical ladder leading from the booby hatch to the upper platform is shown in the photograph on the left. The inclined ladder between the upper and intermediate platforms is shown in the photograph on the right. The location where the C/E, ETO, and Fitter were found at the bottom of the ladder and on the intermediate platform is circled in red. The cargo of scrap metal is visible in both photographs.

Crewmembers rigged the rescue tripod over the booby hatch and lowered a rescue harness to the two ASDs. After carrying the Fitter up the inclined ladder to the upper platform (see Figure 2), the ASDs put the rescue harness on the Fitter, who was hoisted out of the cargo hold at 1800. The rescue harness was taken off the Fitter and lowered back down to the ASDs, who put it on the C/E after they carried him up the inclined ladder to the upper platform. The C/E was removed from the cargo hold at 1815. This process was repeated a third time, and the ETO was lifted out of the cargo hold at 1825. The two ASDs exited Cargo Hold No. 1 after the ETO had been lifted out.

As the Fitter, C/E, and ETO were removed from the cargo hold, it was determined that they did not have a pulse and were not breathing. On deck, crewmembers started administering CPR and medical oxygen using an oxygen resuscitator.

At 1848, BLUE CECIL was diverted to Manila, Philippines after the Master consulted with the Company. At the time, the ship started to roll and the area of the main deck where the crewmembers were assisting the C/E, ETO, and Fitter began to get wet due to spray from waves hitting the ship's bow. The C/E, ETO, and Fitter were transported by stretcher aft near the Accommodation where crewmembers continued to administer CPR and medical oxygen.

At 2059, the Company's medical doctor determined remotely⁶ that the C/E, ETO, and Fitter were deceased after confirming with the Master that they each did not have any detectable vital signs. BLUE CECIL continued en route to Manila, where the ship arrived on 9 December 2023.

⁶ Via video call.

The Certificate of Post-mortem Examination issued by the Philippine authorities stated that the cause of the C/E's, ETO's, and Fitter's deaths was "asphyxia by suffocation." The results of any toxicology testing that might have been conducted as part of the post-mortem exams were not received by the Administrator.

Ship's Crew

BLUE CECIL had a complement of 20 crewmembers, four more than required by the Minimum Safe Manning Certificate issued by the Administrator.

The seagoing experience of the Master and crewmembers on board BLUE CECIL who were involved in this very serious marine casualty was:

RANK	TIME ON BOARD BLUE CECIL	TIME IN RANK	TIME WITH COMPANY	TOTAL TIME AT SEA
Master	4 months	10 years	4.8 months	28 years
C/O	8.7 months	6.2 years	1.6 years	22 years
C/E	6.7 months	0.6 years	1.2 years	9 years
ETO	9.7 months	2.9 years	2 years	6 years
Fitter	7.7 months	3.6 years	8.4 months	10 years
Bosun	4.7 months	1 year	1.9 years	17 years

All of the involved seafarers held the appropriate Republic of the Marshall Islands seafarer documentation for their positions. The C/E was promoted by the Company approximately one month after he signed on board the ship as 2/E. Each of the involved crewmembers also held current medical certificates and were reported to be fit for duty without restrictions.

Each of the involved crewmembers had completed the required onboard familiarization after signing on board BLUE CECIL.

The Administrator did not find any indication that the crewmembers involved with this very serious marine casualty had not received the required amount of rest mandated by the IMO's STCW Code, Section A-VIII/1, paragraphs 2 and 3 and the ILO's MLC, 2006, Regulation 2.3.

Company Procedures

As required by the ISM Code, the Company's SMS included procedures for shipboard tasks, including entry into cargo holds and enclosed space entry and rescue. They also included procedures for stopping work.

The Company's procedures for entering cargo holds stated that permission from the C/O was required to enter a cargo hold. The procedures also required that before giving permission to enter a cargo hold, the C/O needed to ensure that it had been ventilated, that the atmosphere inside the cargo hold had been tested to determine it was safe for entry,

and that an assessment of the hazards associated with the cargo being carried had been completed.⁷ Compliance with the Company’s enclosed space entry procedures was also required when entering a cargo hold.

The Company’s cargo hold access procedures required each entrance to a cargo hold be marked “NO UNAUTHORIZED ENTRY. DANGEROUS ATMOSPHERE.” The procedures did not address physical barriers for preventing unauthorized access to a cargo hold.

The Company’s enclosed space entry procedures required that before any entry into an enclosed space outside of the Engine Room, the Master or C/O conduct an assessment of the space and ensure that the space is ventilated, the atmosphere inside the space is safe for entry, and that an Enclosed Space Entry Permit is issued. Either the C/E or 2/E were responsible for conducting the assessment and issuing an Enclosed Space Entry Permit for entries into enclosed spaces in the Engine Room. These procedures also required that a responsible crewmember be in constant attendance just outside the entrance to the space, be in direct contact with the officer supervising the work, and that rescue equipment⁸ be staged at the entrance. The Company’s enclosed space entry procedures did not address ensuring that all tools and equipment that might have been taken into an enclosed space were removed before the access was secured and the Enclosed Space Entry Permit closed out.

There was no indication that the Company’s procedures for entering a cargo hold or enclosed space were followed when the C/E, ETO, and Fitter entered Cargo Hold No. 1 on 8 December 2023.

Per the Company’s procedures for enclosed space rescues, anyone entering an enclosed space to rescue someone was required to wear an SCBA, a rescue harness, and if possible, a lifeline. It also prohibited anyone from entering an enclosed space except as part of a rescue conducted in accordance with the ship’s enclosed space rescue plan.

Per the Company’s SMS, any crewmember on board Company-managed ships, regardless of their position, “has the right and duty to apply the ‘Stop-Work’ system, if in his/her opinion or judgment, such activity is deemed to be unsafe or risky behavior.”⁹ No blame or fault shall be assigned to a crewmember who exercises their stop-work authority if it is determined that it was not necessary. Examples of situations, that warrant the exercise of stop-work authority identified in the Company’s SMS included:

- (a) changes to the scope of work or work plan;
- (b) improper use of equipment; and
- (c) near-miss or hazardous occurrence or unsafe conditions.

The Company’s Stop-Work Process required that a crewmember “immediately initiate a stop work intervention with the person(s) potentially at risk” if they observed a condition or behavior that posed an imminent hazard to others, equipment, or the environment. The Company’s Stop-Work Process required a crewmember exercising this authority to clearly state he or she was exercising stop-work authority in a non-combative manner. The process also required that

⁷ The Company’s cargo entry procedures also included warnings addressing the potential for the atmosphere inside empty cargo holds to be hazardous.

⁸ Rescue equipment required to be staged at the entrance to an enclosed space included flashlights, an SCBA with fully charged spare cylinders, lifelines and rescue harnesses, and a means of hoisting an incapacitated person from the enclosed space.

⁹ Stop-work authority also extended to the Company’s shore staff, regardless of their position.

a crewmember who exercised his or her stop-work authority inform the supervisor of the task that was stopped if he or she was not present at the work site.

Crewmembers to whom a stop-work action was directed were required by the Company's Stop-Work Process to stop work and assess the situation with the crewmember who initiated the action to determine if the work could proceed with any changes or if some corrective action was required. The work could resume without taking further action if it was agreed that the work could proceed without any changes or corrective action. If it was determined that the reason for the stop-work action was valid, the work was required to be suspended until actions were taken to address the condition or behavior that posed an imminent hazard.

The Company's Stop-Work Process did not address what action the crewmember initiating a stop-work action should take if crewmembers to whom the action was directed did not acknowledge the action, stop the work that was being done, or assess the situation.

The Company's Stop-Work Process required that any exercise of stop-work authority be documented as a near miss. The Company's QHSE Department was required to review all reports of stop-work actions to assess how the situation was addressed, to identify common issues and trends, and to provide input for Company recognition programs.

The Bosun and other crewmembers on board BLUE CECIL stated they had been made aware that they had stop-work authority when they signed on board. None of the ship's officers or ratings who were interviewed as part of the Administrator's marine safety investigation were aware of any instances when this authority had been exercised, although the Bosun did say that he had previously raised concerns about potential safety issues with the C/O during pre-task hazards assessments, which were addressed before work started. None of the other crewmembers provided any indication that they had any concerns or reservations about exercising this authority.

Cargo Hold Access Arrangements

Each of the booby hatches for all five of BLUE CECIL's cargo holds were marked "NO ENTRY W/O PERMISSION" (see Figure 3).¹⁰ The top of each booby hatch cover was also marked "RESTRICTED AREA." Crewmembers stated the warnings had faded and had been repainted after 8 December 2023. It was not reported why the warning differed from the warning required by the Company's cargo hold access procedures. Each of the booby hatches had also been fitted with a lock after 8 December 2023.¹¹

¹⁰ There was a means of access at the forward and aft bulkheads for each of BLUE CECIL's five cargo holds.

¹¹ The keys were held by the Bosun.



Figure 3: Aft booby hatch for Cargo Hold No. 1.

The aft access ladder for Cargo Hold No. 1 consisted of two vertical ladders, an inclined ladder, and two platforms (see Figures 2 and 4).¹² The aft access ladder for Cargo Hold No. 1 was found in good condition and free of defects.

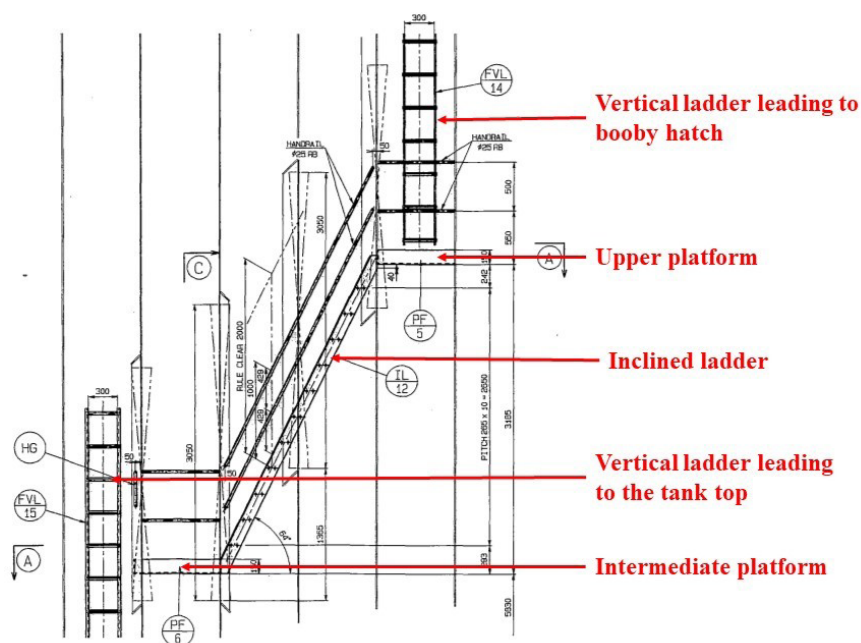


Figure 4: Detail of Cargo Hold No. 1 aft access ladder.

¹² Except for the length of the vertical ladder that extended from the booby hatch to the upper platform, the dimensions of the vertical and inclined ladders, angle of the inclined ladder, and height of the guardrails were all consistent with those required by IMO Resolution MSC.133(76). The vertical ladder that extended from the booby hatch to the upper platform was 3.9 m, whereas IMO Resolution MSC.133(76) requires that the upper most section of a cargo hold access ladder be 2.5 m. This resolution was adopted by the IMO to facilitate the implementation of SOLAS regulation II-1/3-6 and is applicable to bulk carriers of 20,000 GT or more constructed on or after 1 January 2006. Neither SOLAS regulation II-1/3-6 nor IMO Resolution MSC.133(76) are applicable to BLUE CECIL, which was built in 2004.

Enclosed Space Entry Training and Drills

Enclosed space entry and rescue drills had been conducted on board BLUE CECIL once a month as required by the Company. The Company's requirement to conduct these drills once a month exceeded the IMO mandate that an enclosed space entry and rescue drill be held at least every two months.¹³

The C/O, ETO, and Fitter had participated in each of the enclosed space entry and rescue drills conducted on board since they signed on the ship. The most recent enclosed space entry and rescue drill conducted on board BLUE CECIL had been held on 25 November 2023. The scenario for this drill was a rescue from the lower flat of the Engine Room near the main engine crankshaft.

Gas Detection Equipment

BLUE CECIL had three portable multi-gas detectors available on board capable of detecting methane, oxygen, hydrogen sulfide, and carbon monoxide. The multi-gas detectors were last tested and calibrated on 11 and 12 January 2023 by a certified service engineer.

PART 3: ANALYSIS

The following Analysis is based on the above Factual Information.

Company's Cargo Hold Entry and Enclosed Space Entry Procedures

The Company had procedures in place to ensure that cargo holds and enclosed spaces on board Company-managed ships could be entered safely. These procedures included warnings and relevant safety information. They also required that certain conditions be met (e.g., the space be ventilated, and the atmosphere determined to be safe for entry, etc.) and certain safeguards be in place before anyone enters a cargo hold or enclosed space (e.g., stationing a crewmember and staging rescue equipment just outside the entrance to the space).

The Company's procedures for entering a cargo hold or enclosed space are examples of administrative controls. Such controls lower risk by reducing exposure to a hazard while a particular task or activity is being conducted by providing written instructions for the task or activity.¹⁴ Administrative controls do not establish physical barriers and are only effective if they are implemented consistently.

Including the C/E, ETO, and Fitter on board BLUE CECIL, between 2019 and 2023, ten seafarers working on board Republic of the Marshall Islands-registered ships died when they entered an enclosed space without following the established onboard enclosed space entry procedures. The Administrator's investigations of these occupational fatalities identified evidence that more than half of the seafarers had ignored a warning from another crewmember to not

¹³ Per SOLAS regulation III/19.3.3, "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."

¹⁴ Administrative controls are lower-level means of reducing risk. Higher-level means of reducing risk are those that either eliminate the hazard, substitute the hazard with one that is less hazardous, or isolate the hazard. US NIOSH, Hierarchy of Controls (<https://www.cdc.gov/niosh/hierarchy-of-controls/about/index.html>).

enter an enclosed space without following the proper procedures. During this same period, there were no occupational fatalities reported to the Administrator that were attributed to inappropriate or improper enclosed space entry procedures during entries into an enclosed space that were conducted in accordance with the established shipboard procedures. These entries include the entry conducted on board BLUE CECIL on 30 November 2023 when the C/O, C/E, and Fitter entered Cargo Hold No. 1 without incident.

Entry into Cargo Hold No. 1

On the afternoon of 8 December 2023, the C/E had told the Bosun that he intended to enter Cargo Hold No. 1 to retrieve a welding cable and other tools that had been left inside the cargo hold after the repairs to No. 1 P TST were completed on 30 November 2023. The Bosun responded by telling the C/E that it was dangerous to enter the cargo hold and that he should get permission from the Master. Despite the warning from the Bosun, and the painted warning on the deck next to the booby hatch to not enter without permission, the C/E, ETO, and Fitter likely entered Cargo Hold No. 1 sometime between 1500–1545. Although the reason the C/E intended to enter Cargo Hold No. 1 is known (i.e., to retrieve the left behind tools), it is not known why he apparently thought the cargo hold could be safely entered without obtaining permission from the Master or otherwise complying with the Company’s cargo hold and enclosed space entry procedures.

Based on how they were found lying at the bottom of the inclined ladder inside Cargo Hold No. 1, the ETO was the first person to have entered the cargo hold on 8 December 2023. He was followed by the C/E and then the Fitter. What cannot be established is if the C/E entered the cargo hold in response to a call for assistance from the ETO or if he had followed the ETO into the cargo hold to help him retrieve the welding cable and other tools that had been left behind on 30 November 2023. Similarly, it cannot be established if the Fitter entered the cargo hold in response to a call for assistance or to help the C/E and ETO recover the welding cable and other tools out of the cargo hold.

Response

The Bosun entered Cargo Hold No. 1 looking for the C/E, ETO, and Fitter after none of the crewmembers who were in the Changing Room at the end of the workday reported seeing them. The Bosun indicated he understood that he should not have entered the cargo hold, but that he was focused on finding the C/E, ETO, and Fitter. The Bosun’s entry into the cargo hold on his own and without informing the OOW or donning an SCBA endangered his life. His entry was also not necessary since informing the OOW that the C/E, ETO, and Fitter might be in Cargo Hold No. 1 would have initiated a response per the established shipboard emergency procedures.

After the Bosun reported that three crewmembers were unconscious inside of Cargo Hold No. 1, the OOW announced the emergency over the ship’s PA system, initiating a response that was conducted in accordance with the ship’s established procedures. Although the two ASDs had to carry the C/E, ETO, and Fitter up the inclined ladder from where they had fallen to the upper platform so that they could be lifted out of the cargo hold through the booby hatch (*see Figures 2 and 4*), the rescue operation was conducted without further incident or injury.

Stop-Work Authority

Consistent with the Company’s Stop-Work Process, the Bosun recognized it was hazardous for the C/E to enter Cargo Hold No. 1 without following the established enclosed space entry procedures. Although he did not state that he

was exercising his stop-work authority, he did intervene by telling the C/E that it was not safe and that he should get permission from the Master. The C/E's response was not consistent with the Company's Stop-Work Process. Rather than acknowledging that the Bosun's concern was valid and that the entry into Cargo Hold No. 1 should be done in accordance with the Company's procedures, the C/E simply indicated that they would enter the cargo hold later. Whether the C/E might have responded differently if the Bosun had formally exercised his stop-work authority per the Company's process cannot be determined.

The Company's Stop-Work Process did not address what action a crewmember initiating a stop-work action should take if the supervisor did not acknowledge the action, stop the work that was being done, or assess the situation. However, because the Bosun expected that the C/E would speak with the Master, such a requirement might not have prompted the Bosun to inform the C/O or Master that the C/E intended to enter Cargo Hold No. 1. It could not be confirmed if the Bosun assumed that the C/E, as a senior officer, would inform the Master, or if he was concerned about possible repercussions if he "reported" the C/E.

Stop-work authority can prevent marine casualties by allowing crewmembers, regardless of their position on board, to manage safety in real time by giving them the responsibility, obligation, and right to stop work that poses or creates an imminent danger to themselves, others, the ship and cargo, or the environment. For stop-work authority to be effective, crewmembers must not only be aware that they have this authority, but they must also have confidence that the authority is non-negotiable and can be exercised without fear of repercussion. Crewmembers must also be as familiar with how to both issue and respond to a stop-work action or instruction as they are with their other shipboard duties.

PART 4: CONCLUSIONS

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

1. Causal factors that contributed to this very serious marine casualty include:
 - (a) a welding cable and other tools being left in Cargo Hold No. 1 on 30 November 2023 after repairs to the No. 1 P TST were completed; and
 - (b) the C/E's decision to enter Cargo Hold No. 1 without complying with the Company's enclosed space entry procedures to recover the welding cable and other tools despite the warning from the Bosun that it was not safe.
2. Additional causal factors that may have contributed to this very serious marine casualty include:
 - (a) ineffective onboard implementation of the Company's Stop-Work Process.
3. Additional issues that were identified but that did not contribute to this very serious marine casualty include:
 - (a) the Bosun entering Cargo Hold No. 1 by himself without complying with the Company's enclosed space entry procedures, such as informing the OOW or wearing an SCBA.

PART 5: PREVENTIVE ACTIONS

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

1. On board all Company-managed ships, it is required that:
 - (a) all cargo hold bobby hatches be locked and that the keys be held by the ship's C/O;
 - (b) notices be placed in strategic locations after loading cargo indicating the cargo carried and the dangers associated with the cargo;
 - (c) the Company's Stop-Work Process be enforced by all officers and crew; and
 - (d) additional training be conducted regarding enclosed space entry and rescue.
2. A review was conducted of the Company's safety culture and implementation of industry best practices.
3. An internal audit was conducted on the implementation of the Company's enclosed space entry procedures on board all Company-managed ships;
4. The lessons learned were shared with all ships in the Company-managed fleet.
5. The pre-joining briefing for crewmembers working on board Company-managed ships was revised to include the lessons learned from this very serious marine casualty.

The Administrator has taken the following Preventive Actions:

1. MSA No. 03-24 was issued reminding ship managers of the need for continued vigilance regarding enclosed space entry and rescue training. MSA No. 03-24 included a number of recommendations based on a review of enclosed space entry incidents that had occurred on board Republic of the Marshall Islands-registered ships between 2020–2023.

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:
 - (a) review and, as necessary, revise its enclosed space entry procedures to:
 - (i) document the requirement for cargo hold bobby hatches to be locked and that the keys be held by the ship's C/O; and
 - (ii) require that before an Enclosed Space Entry Permit is closed that the relevant space be checked to ensure that no tools or equipment are left behind;
 - (b) review and, as necessary, revise the Company's Stop-Work Process to address the actions a crewmember initiating a stop-work action should take if crewmembers to whom a stop-work action is addressed do not acknowledge the action, stop the work that was being done, or assess the situation to determine if some corrective action was required before restarting work;

- (c) review and, as necessary, revise its onboard training requirements to include periodic reviews of the Company's Stop-Work Process and practice exercising this authority; and
- (d) undertake a fleet-wide safety campaign focused on ensuring crewmembers on board Company-managed ships:
 - (i) understand the dangers of entering a cargo hold or another enclosed space without following the ship's established procedures;
 - (ii) are aware they have stop-work authority and that they each have a responsibility for stopping work that poses or creates an imminent danger to themselves, others, the ship and cargo, or the environment;
 - (iii) understand that the authority is non-negotiable and can be exercised without fear of repercussion; and
 - (iv) are familiar with how to issue and respond to a stop-work action or instruction.

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