

ACCIDENT REPORT

VERY SERIOUS MARINE CASUALTY

REPORT NO 9/2022

JULY 2022

This investigation was carried out by the UK Marine Accident Investigation Branch (MAIB) on behalf of the Isle of Man Administration in accordance with the Memorandum of Understanding between the MAIB and the Red Ensign Group Category 1 registries of Isle of Man, Cayman Islands, Bermuda and Gibraltar.

Extract from The Isle of Man Merchant Shipping (Accident Reporting and Investigation) Regulations 2001 – Regulation 4:

“The fundamental purpose of investigating a casualty, an accident, or an incident under these Regulations is to determine its circumstances and the causes with the aim of improving the safety of life at sea and the avoidance of accidents in the future. It is not the purpose to apportion liability, nor, except so far as is necessary to achieve the fundamental purpose, to apportion blame.”

NOTE

Under Section 4 of the Isle of Man Merchant Shipping Act 1985 a person is required to answer an Inspector's questions truthfully. If the contents of this report were subsequently submitted as evidence in court proceedings then this would contradict the principle that a person cannot be required to give evidence against themselves. Therefore, the Isle of Man Ship Registry makes this report available to interested parties on the understanding that it shall be inadmissible in any judicial proceedings whose purpose, or one of whose purposes is to attribute or apportion liability or blame.

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Mooring deck accident on board the cargo vessel *Teal Bay* resulting in one fatality at Kavkaz South anchorage, Russia on 30 August 2021

BACKGROUND

This investigation into a very serious marine casualty was conducted by the Marine Accident Investigation Branch on behalf of the Isle of Man Ship Registry, a member of the Red Ensign Group. The investigation was conducted remotely as access to the vessels, shore authorities and port involved was not possible due to COVID-19 travel restrictions. The remote investigation also limited the evidence that was directly available from Russian authorities.

SUMMARY

At about 2235 on 30 August 2021, the chief officer (C/O) of the Isle of Man registered general cargo vessel *Teal Bay* was fatally injured when he was struck on the head by a tensioned mooring line that sprang out of an open roller fairlead. *Teal Bay* was loading grain when moored alongside an anchored bulk carrier. The mooring line was being used to pull *Teal Bay* forward and it sprang free when its lead angle became too great for the open fairlead to restrain it.

Image courtesy of Hans-Peter Shroeder (www.marinetraffic.com)



Teal Bay

The C/O was struck because he was standing in a hazardous area close to a mooring line under significant tension. The operation to move *Teal Bay* forward had not been risk assessed and was undertaken with insufficient crew. The use of an open roller fairlead was inappropriate during a ship to ship (STS) transfer operation where a freeboard differential between the two vessels was foreseeable and created the hazard of a high lead angle on mooring lines.

Since the accident, *Teal Bay*'s management company, V.Ships Ship Management (India), has conducted additional safety training with the vessel's crew, issued a fleetwide safety alert to highlight the issues raised by this accident report, and set out a plan for replacement of open fairleads on its vessels. V.Ships has also amended its safety management procedures and generic risk assessments to include STS transfer of bulk cargoes. Additionally, the Maritime and Coastguard Agency (MCA) has undertaken to amend the Code of Safe Working Practices for Merchant Seafarers to include guidance recommending that open fairleads are not used where there is a mooring line upward lead angle. A recommendation has been made to the Isle of Man Ship Registry to promulgate the safety lessons in this report to vessels on its register.

FACTUAL INFORMATION

Narrative

On 29 August 2021, *Teal Bay* arrived at the Kavkaz anchorage in Russia to load a cargo of grain from the anchored bulk carrier, *Kavkaz V*, which was acting as a grain storage vessel. At 2215, a pilot boarded *Teal Bay* and the vessel was moored alongside and prepared for the STS transfer of cargo. The mooring arrangement, agreed between the master and pilot, consisted of three head lines, three stern lines, two forward springs and two aft springs; all lines belonged to *Teal Bay*. At 0025 on 30 August, *Kavkaz V*'s crew began loading grain into *Teal Bay*'s holds using its crane grabs, at which point the two vessels' freeboards were similar.

At about 2220, with loading around 80% complete, *Kavkaz V*'s forward crane operator advised his duty officer that *Teal Bay* needed to be moved forward to allow the crane grab to reach part of the hold he was loading. By this time, *Kavkaz V*'s deck was about 8m higher than *Teal Bay*'s; it was dark, and the wind was light. At 2223, *Kavkaz V*'s third officer (3/O) called *Teal Bay* using very high frequency (VHF) radio and requested that the vessel be moved forward 2-3m. *Teal Bay*'s master instructed the on watch crew and the C/O to proceed to the forward and aft mooring decks to warp the vessel forward using the spring lines¹. The master decided not to wake the off watch crew to assist as this would disrupt their hours of rest. When discussing the plan for the warping operation, the master acknowledged that the C/O was tired.

At 2234, with the C/O and an able-bodied seaman (AB) in position on the aft mooring deck and the 3/O and bosun on the forward mooring deck, *Teal Bay*'s master informed *Kavkaz V* that they were starting the warping operation. On the aft mooring deck, the C/O was standing close to the vessel's side with the AB standing by the winch ready to heave in the aft spring (**Figure 1**). As the bosun slackened the forward springs, the AB began to haul in on one of the aft springs to heave *Teal Bay* forward. Almost as soon as the mooring line came under tension, it sprang out of its shipside open roller fairlead and struck the C/O's head as it snapped tight. The C/O fell unconscious to the deck.

The AB used VHF radio to immediately inform the master that the C/O had been struck and injured. *Teal Bay*'s master directed the crew to provide first aid to the C/O and then called *Kavkaz V* and Kavkaz traffic² on VHF radio to request medical assistance. The master also phoned the agent and company superintendent, requesting a medical evacuation of the C/O, and alerted the nearest Maritime Rescue Coordination Centre (MRCC). The C/O was lying unresponsive on the deck, with no visible injuries; he

¹ Moving a vessel using the mooring lines is known as 'warping'.

² Kavkaz traffic was the port authority managing the anchorage.

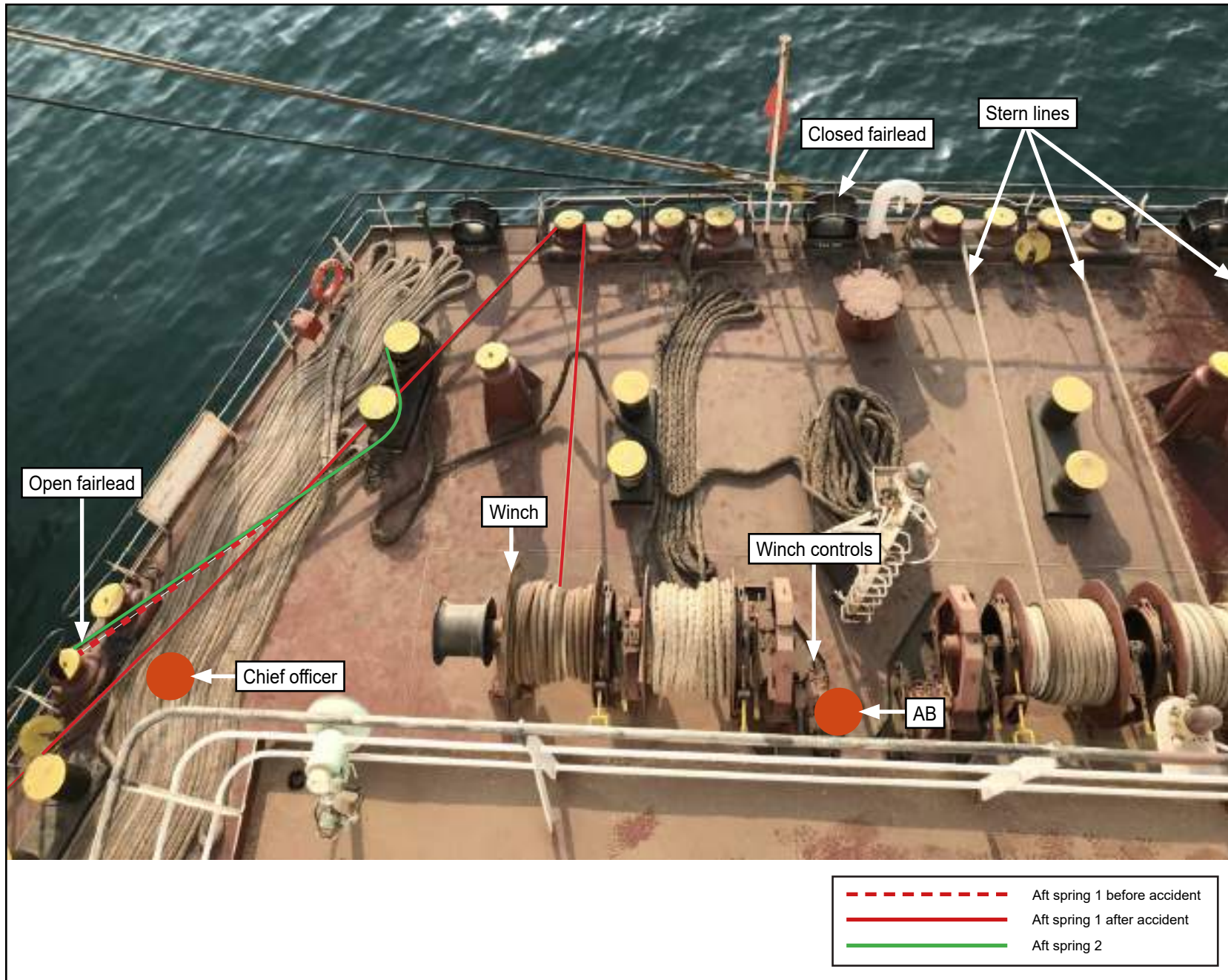


Figure 1: *Teal Bay's* aft mooring arrangement (dotted line indicates position of aft spring 1 before the accident)

was breathing, and a pulse was observed. *Teal Bay's* second officer (2/O) administered first aid to the C/O, giving him oxygen and attaching a blood pressure monitor and pulse oximeter³. *Teal Bay's* portable defibrillator was also brought to the scene.

At 2255, the agent informed *Teal Bay's* master that the tug *Dobrynya* would take the C/O ashore. At 2316, *Dobrynya* arrived and the tug crew informed *Teal Bay's* master that they were awaiting permission from the local port of Taman, Russia, before embarking the C/O and that the agent was trying to organise his evacuation by helicopter.

At 2340, *Dobrynya's* crew informed *Teal Bay's* master that no helicopter was available and that they would take the C/O ashore. The C/O was transferred to *Dobrynya* accompanied by the 2/O and another crew member and, at 2350, the tug left *Teal Bay*. By this time the C/O's condition had deteriorated and his pulse had weakened. At 0030 on 31 August, *Dobrynya* arrived at Taman and a paramedic was transferred to the tug at 0045. The paramedic assessed the C/O and checked for responsiveness and vital signs. After observation, and with no response or sign of life, the paramedic declared the C/O to be deceased. A postmortem examination determined he had suffered closed blunt force trauma to the head, traumatic swelling of the brain and a brain haemorrhage.

Vessels and crew

Teal Bay was an Isle of Man registered 177.13m general cargo vessel. *Kavkaz V* was a Liberian registered 185.74m bulk carrier operated by a Russian crew.

Teal Bay's 20 crew were Ukrainian nationals who all held appropriate qualifications for their roles. The C/O, Yuriy Maslov, was a 54-year-old experienced seafarer and had been with the company for over 20 years. He was wearing shorts, a T-shirt, safety boots, gloves and a hard hat. On the day of the accident, his record of work and rest showed that he had worked from 0600 to 1000 and then from 1700 onwards.

Teal Bay's C/O was in charge of cargo operations and was not working a set watch pattern during the loading; the 2/O and 3/O were keeping a 6 hours on, 6 hours off routine. The 3/O was on watch at the time of the warping operation, supported by the bosun and an AB.

Both *Teal Bay's* master and 2/O held STCW⁴ certificates for medical first aid on board ship⁵, the master also held a certificate for medical care on board ship⁶.

Aft mooring arrangement

Teal Bay was moored starboard side to alongside *Kavkaz V* (**Figure 2**). The three stern lines were rigged from the port side of the aft mooring deck. Two were attached to the port mooring winch drums and led through open roller fairleads at the stern; the third was secured to a set of double bitts and led through a closed fairlead (**Figure 1**). All three stern lines were led through a single closed fairlead on the port side of *Kavkaz V's* aft mooring deck and placed over bitts.

The aft spring lines were rigged from the starboard side of the aft mooring deck. One (aft spring 1) was attached to the starboard mooring winch outer drum and led around an open roller fairlead at the stern, back through a set of double bitts and then forward through an open roller fairlead on the outer edge of the mooring deck. The second aft spring (aft spring 2) was secured above aft spring 1 on the double bitts and led forward through the same open roller fairlead (**Figure 1**). Both springs passed through the same closed fairlead on *Kavkaz V's* main deck.

There were five closed Panama⁷ fairleads around *Teal Bay's* aft mooring deck, three at the stern and one each side, close to the stowed accommodation ladders.

³ A pulse oximeter is a medical device which measures blood oxygen levels and heart rate and is attached to the tip of a finger.

⁴ International Convention on Standards of Training, Certification and Watchkeeping (STCW).

⁵ In accordance with provisions of Regulation VI/4 p.1 of the STCW convention.

⁶ In accordance with provisions of Regulation VI/4 p.2 of the STCW convention.

⁷ Panama fairleads are non-roller type fairleads that are enclosed, enabling mooring lines to be led to shore with equal facility either above or below the horizontal.



Figure 2: *Teal Bay* (left) moored alongside *Kavkaz V* (right)

Cargo loading arrangements

When acting as a storage vessel at anchor, *Kavkaz V*'s cargo holds were loaded with grain from river barges. The grain was then discharged into other vessels moored alongside for onward transport (**Figure 3**). *Teal Bay*'s crew had not loaded cargo in this way before and, until the pilot boarded and informed him of the loading arrangements, the master was expecting to load grain directly from barges while at anchor.

Image courtesy of *Kavkaz V*



Figure 3: *Kavkaz V* (centre) loading grain from a barge (right) while transferring cargo to another vessel (left)

Onboard safety management

Teal Bay's mooring procedures required an officer-led team of three on each of the forward and aft decks, with the master in overall control and the C/O supervising. The vessel's safety management system (SMS) included a section on mooring, which emphasised the hazardous nature of mooring deck operations and the need for personnel to stand clear of all lines under tension. The section also highlighted the need for mooring operations to have sufficient personnel available and for winch operators to have sight of the person in charge, as well as the importance of ensuring multiple ropes were not used on the same fairleads or bollards. The SMS mooring section directed crew to refer to the latest edition of the MCA's Code of Safe Working Practices for Merchant Seafarers (COSWP⁸). Although an MCA document, COSWP was accepted as best practice onboard Isle of Man registered vessels.

⁸ Code of Safe Working Practices for Merchant Seafarers 2015 edition – Amendment 5, October 2020.

COSWP advised that warping should only be carried out following a comprehensive risk assessment and that a toolbox talk should precede the evolution. COSWP emphasised the hazardous nature of mooring decks, noting that *the whole mooring deck may be considered a danger zone*, and stated that:

When mooring lines are under strain, all personnel in the vicinity should remain in positions of safety, i.e. avoid the snap-back⁹ zones.

Teal Bay's SMS did not include a procedure for warping a vessel using the mooring lines.

Teal Bay's SMS included a section for mooring arrangements of tanker STS transfer operations. This section required that tankers undertaking such an operation had a specific STS plan in place and referred to the ICS¹⁰/OCIMF¹¹ STS transfer guide¹². The STS guidance on mooring equipment stated that open fairleads were not recommended and that:

Only fairleads of the enclosed type should be used, except on a ship that will always have substantially greater freeboard than the other. This will ensure that the fairleads will remain effective in controlling the mooring line leads as the freeboard difference between the two ships changes.

Teal Bay's SMS did not contain guidance for STS of dry cargo.

Specific tasks on board *Teal Bay* were risk assessed through preparation of a job safety analysis (JSA). Among the JSAs in use at the time of the accident were assessments for mooring operations and cargo loading, neither of which referenced loading cargo while moored alongside a similar sized vessel. No JSA was prepared in advance of the warping operation.

Maritime Labour Convention

The Maritime Labour Convention¹³ (MLC) was an International Labour Organization convention setting out seafarers' rights. Russia was a signatory to the convention. Regarding access to medical care, Regulation 4.1 paragraph 3 stated that *each member shall ensure that seafarers on board ships in its territory who are in need of immediate medical care are given access to the Member's medical facilities on shore*.

The MLC also set out the limit for seafarers' hours of work and rest with a maximum of 14 hours' work permitted in any 24-hour period.

Mooring accidents

During the 10-year period prior to the accident, the Isle of Man registry recorded 22 injuries and one fatality resulting from mooring deck accidents.

⁹ Snap-back is the sudden recoil of a mooring line that has failed under tension. The snap-back zone is the anticipated area where a parted mooring line could recoil with great velocity.

¹⁰International Chamber of Shipping.

¹¹Oil Companies International Marine Forum.

¹²Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases. Joint industry publication by ICS, OCIMF, SIGTTO and CDI, 2013.

¹³Maritime Labour Convention, 2006 as amended (MLC 2006) <https://www.ilo.org/dyn/normlex/en/f?p=1000:91::NO:91::>

ANALYSIS

Overview

Teal Bay's C/O was fatally injured because he was struck on the head when a tensioned mooring line sprang free from an open roller fairlead. This section of the report will examine the reasons why the mooring line jumped out of the fairlead and struck the C/O. The conduct of the warping operation and the circumstances of the emergency response will also be discussed.

The accident

Both COSWP and *Teal Bay's* SMS emphasised the hazardous nature of mooring operations and the need to stand clear of lines under tension. However, despite his lengthy seafaring experience, *Teal Bay's* C/O positioned himself in a hazardous zone immediately adjacent to the tensioned aft spring during the warping operation.

Choosing to preserve crew rest and considering the short distance to be moved, the master decided not to treat the warping as a mooring operation as that would require waking off watch crew. Instead, only the C/O and those on watch for cargo operations were tasked to conduct the warping. This meant the C/O was working on the aft deck with a single AB, in contrast to mooring operations where he acted in a supervisory role and the aft team of three was led by another officer. Without a full mooring team, the C/O was probably attempting to simultaneously supervise the aft deck and the overall evolution, and this likely contributed to his decision to stand close to the ship's side where he could monitor *Teal Bay's* forward motion while maintaining sight of the AB operating the winch.

Although on board records indicated that the C/O had met the requirements of the hours of work and rest regulations, he was tired when tasked to warp the vessel forward, a point acknowledged by the master. The C/O's tiredness may have influenced his actions and motivated him to complete the job quickly so he could rest. As the accident occurred almost immediately when the warping started, there was little opportunity for the AB to challenge the C/O's decision to stand in a hazardous location even if he had recognised it as such.

A combination of a desire to complete the move and a need to monitor both the winch operator and *Teal Bay's* forward progression led to the C/O standing in a hazardous location where he had, almost certainly, not appreciated the risk of the spring line jumping out of the fairlead.

The warping operation

Warping a vessel using the mooring springs involved working with, and in proximity to, lines under tension and required an effective plan, sufficient crew, and a risk assessment before starting. This did not happen on *Teal Bay* and the forward move was attempted without a clear plan, risk assessment or safety brief, and without full mooring teams.

With only a short distance to move, the master's decision to warp *Teal Bay* forward was reasonable; however, it did not consider the hazardous upward lead that the mooring lines had developed because of the freeboard differential between the two vessels. At the start of the loading operation, the freeboards of *Kavkaz V* and *Teal Bay* were similar, but after 22 hours there was a difference of about 8m (**Figure 4**). When tension was applied to the aft spring the upward angle of the line became too great for the open fairlead to contain it and it jumped violently upwards, striking the C/O. As the freeboard difference had arisen gradually, and *Teal Bay's* crew were unfamiliar with situations where their vessel was lower than the object it was moored to, they had not realised the dangerous situation that had developed. Without a risk assessment prior to the forward move, the opportunity to identify the hazard and take steps to minimise the risk to crew was lost.

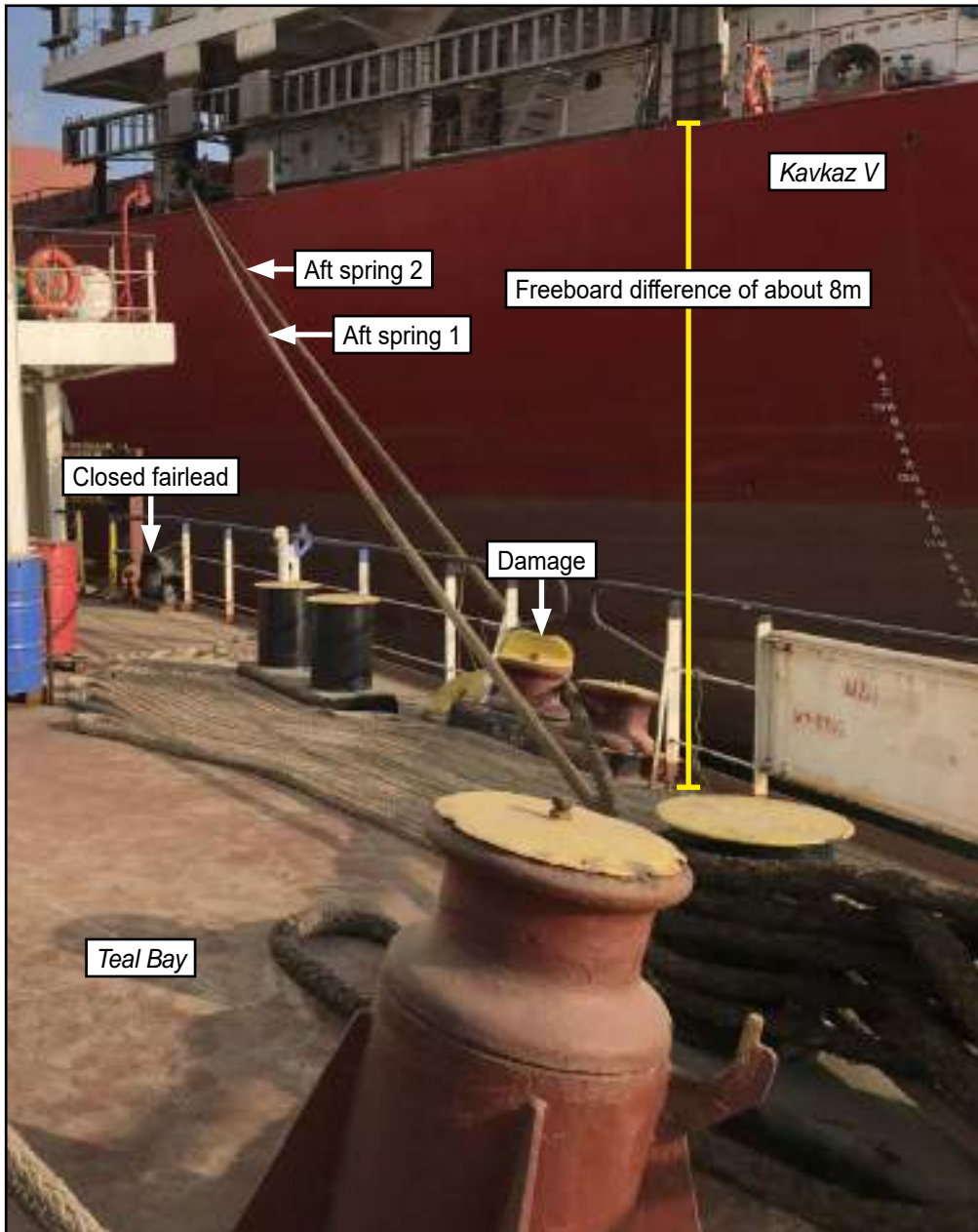


Figure 4: *Teal Bay's* aft deck, showing the nearest closed fairlead, freeboard difference, damage and location of aft spring after the accident

Loading was close to completion when *Kavkaz V's* crew requested the forward move and *Teal Bay's* master was motivated to execute the operation and finish loading. This desire to get the job done and the short distance to be moved may have contributed to him pressing ahead with neither a clear plan nor risk assessment.

Mooring arrangement

When transferring cargo between two vessels of equal size and freeboard, mooring lines will develop upward leads as the discharging vessel's freeboard rises and the loading vessel's falls. To ensure containment of mooring lines that have or develop upward leads, closed fairleads must be used.

Teal Bay's crew were unfamiliar with loading cargo from a similar-sized vessel and were not expecting to load in this way, only finding out the loading arrangements at short notice. *Teal Bay's* SMS lacked a procedure for bulk cargo STS operations, there was no specific guidance in COSWP and the crew had no STS transfer experience. With little time to plan and scant knowledge resource to draw on, the crew led both aft springs through an open fairlead without appreciating that this was unsuitable for STS operations due to the likelihood of an upward lead developing.

The decision to lead two lines through the same roller fairlead was unsafe and the presence of a second line restricted the available space and limited the fairlead's containment ability, almost certainly contributing to the aft (upper) spring 1 jumping out under tension.

Although *Teal Bay's* aft deck mooring equipment included several closed fairleads (**Figure 4**) the springs were led through an open one. This was probably because, constrained by the position of mooring equipment on both vessels, *Teal Bay's* crew judged that the open fairlead provided the most suitable arrangement for the aft spring and had not considered the additional hazards introduced by the loading method. This lack of hazard recognition was further demonstrated by the fact that *Teal Bay's* mooring risk assessment did not include reference to STS loading.

Teal Bay's mooring arrangement was unsuitable for the STS loading operation because the crew were faced with limited time to plan, an unfamiliar loading arrangement and a lack of guidance. Thus, they did not recognise the risk of using the open fairlead.

Emergency response

The MLC required that seafarers should be allowed access to medical facilities ashore. Despite the efforts of *Teal Bay's* master and assistance from the tug *Dobrynya*, it was more than 2 hours after the accident before the C/O was seen by a medical professional, by which time he was deceased.

Although *Teal Bay's* master was in direct contact with the agent, the local traffic channel, the nearest vessel (*Kavkaz V*), the local port and local MRCC, there was no coordination between the various agencies, and no one was in overall control of the emergency response. This lack of coordination and confusion over the method of evacuation and port permissions resulted in a delay of around 25 minutes to the C/O's evacuation. The C/O's condition during *Dobrynya's* passage to the port was unclear, but by the time the paramedic began his observations the C/O had succumbed to his injuries. Although *Teal Bay's* crew attempted first aid, the C/O's head injury was almost certainly beyond the capabilities of both their equipment and medical expertise and his chances of survival were slim.

Given the severity of his injuries, it is unknown whether the delays in the C/O receiving professional medical attention had any bearing on his death; however, the lack of coordination by the parties involved in organising the medical response created delays that lessened his chances of survival.

CONCLUSIONS

- *Teal Bay's* C/O was struck on the head and fatally injured by a tensioned mooring line when it sprang out of a roller fairlead and snapped tight.
- The mooring line sprang free because the fairlead in use was open and the lines had developed a hazardous upward lead during STS cargo operations as the difference between the vessels' freeboard increased.
- Leading two lines through the same fairlead restricted the space available and almost certainly contributed to the loss of spring line 1 containment.
- The number of crew assigned to carry out the warping operation was insufficient and almost certainly influenced the C/O's decision, which went unchallenged, to stand in a hazardous area.
- There was insufficient planning for both the mooring and the warping; this happened because, for both evolutions, there was a lack of time available to plan and the crew was unfamiliar with STS bulk cargo operations.
- Despite the crew's efforts and the assistance of the tug *Dobrynya*, it took over 2 hours for the casualty to be seen by a medical professional. Given the severity of his injuries, it is unknown whether the delays in the C/O receiving medical attention had any bearing on his death; however, the lack of coordination by the parties involved in organising the medical response created delays that lessened his chances of survival.

ACTION TAKEN

MAIB actions

The **Marine Accident Investigation Branch** has written to the MCA proposing that consideration be given to amending COSWP to highlight the risk of a loss of containment when using open fairleads where there is a possibility of an upward lead angle of a line.

Actions by other organisations

The **Maritime and Coastguard Agency** has undertaken to include guidance on the use of open fairleads in the next set of scheduled COSWP amendments.

V.Ships Ship Management (India), *Teal Bay's* management company, has:

- Commissioned and overseen the production of a human factors analysis of the accident.
- Sent a fleetwide safety alert to highlight the safety issues raised by this accident.
- Conducted additional safety training with *Teal Bay's* crew, including modules on safe mooring operations and STS.
- Issued a work instruction setting out a plan to remove open fairleads from the fleet and replace them with a closed type or universal type of fairlead and directed managers to make allowance for this within the dry dock specification for vessels scheduled to dry dock.
- Reviewed SMS procedures to include guidance on STS operations for bulk carriers with a specific bulk carrier checklist and office involvement in the STS approval process.
- Amended the company risk assessments to include a generic risk assessment for bulk carrier STS operations.
- Amended the SMS to include detailed guidance on warping operations.

RECOMMENDATIONS

The **Isle of Man Ship Registry** is recommended to:

- 2022/128** Promulgate the safety lessons from this fatal accident to owners and operators of vessels on its register.

Safety recommendations shall in no case create a presumption of blame or liability

SHIP PARTICULARS

Vessel's name	<i>Teal Bay</i>
Flag	Isle of Man
Classification society	Det Norske Veritas
IMO number	9343637
Type	Open hatch general cargo
Registered owner	PNR Marine Trading VIII LLC
Manager(s)	V.Ships Ship Management (India) Pvt.Ltd
Year of build	2007
Construction	Steel
Length overall	177.13m
Registered length	168.5m
Gross tonnage	20236
Minimum safe manning	16
Authorised cargo	Dry bulk

VOYAGE PARTICULARS

Port of departure	Hereke, Turkey
Port of arrival	Kavkaz South anchorage, Russia
Type of voyage	International
Cargo information	Grain
Manning	20

MARINE CASUALTY INFORMATION

Date and time	30 August 2021 at about 2235
Type of marine casualty or incident	Very Serious Marine Casualty
Location of incident	45°07.971 N 036°34.912 E
Place on board	Aft mooring deck
Injuries/fatalities	1 fatality
Damage/environmental impact	Minor damage to roller fairlead
Ship operation	Cargo loading: ship to ship transfer
Voyage segment	Moored to anchored vessel
External & internal environment	Light breeze, calm sea, darkness
Persons on board	20