MA2024-7

MARINE ACCIDENT
INVESTIGATION REPORT

July 25, 2024

Japan Transport Safety Board

The objective of the investigation conducted by the Japan Transport Safety Board in accordance with the Act for Establishment of the Japan Transport Safety Board is to determine the causes of an accident and damage incidental to such an accident, thereby preventing future accidents and reducing damage. It is not the purpose of the investigation to apportion blame or liability.

TAKEDA Nobuo
Chairperson
Japan Transport Safety Board

Note:

This report is a translation of the Japanese original investigation report. The text in Japanese shall prevail in the interpretation of the report.

《Reference》

The terms used to describe the results of the analysis in "3. ANALYSIS" of this report are as follows.

i) In case of being able to determine, the term "certain" or "certainly" is used.

ii) In case of being unable to determine but being almost certain, the term "highly probable" or "most likely" is used.

iii) In case of higher possibility, the term "probable" or "more likely" is used.

iv) In a case that there is a possibility, the term "likely" or "possible" is used.

MARINE ACCIDENT INVESTIGATION REPORT

June 19th, 2024
Adopted by the Japan Transport Safety Board
Chairperson TAKEDA Nobuo
Member ITO Hiroyasu
Member UENO Michio
Member SOUDA Hisako
Member OKAMOTO Makiko

Accident Type	Fatality of the Linesman
Date and Time	Around 07:54 on November 9, 2021 (local time, UTC+9 hours) (Date and Time of Death : Around 18:11 on November 12, 2021)
Location	Akaishi, Komatsushima District, Tokushima Komatsushima Port, Tokushima Prefecture - 10m berth Around 037°true bearing, 1.1 mile from Wadanohana lighthouse. (Approximate North latitude 33°59.7′, East longitude 134°37.3′)
Summary of Accident	When the Container Ship DONGJIN FORTUNE with master and 16 crew members on board were during an operation of berthing on the Akaishi-10m berth with starboard side, a linesman who was working at the berth to connect the ship's mooring line to the bollard (hereinafter referred to as "mooring lines work") was seriously injured when he was hit by a mooring line bouncing up, and he had subsequently died.
Process and Progress of the Investigation	On November 10, 2021, the Japan Transport Safety Board (JTSB) appointed a Regional Investigator in charge (Kobe Office) and another one to the investigation of this accident. At a later date, the Regional Investigator in charge and another one were replaced by Marine Accident Investigator. November 11, 2021, June 7, 8 and July 29, 2022 : Interviews. January 18, 24, May 11, 13, 17 and 31, 2022 : Received of questionnaire. On October 27, 2022, an Interim Report based on the results of the fact-finding investigation conducted up to the point was submitted to the Minister of Land, Infrastructure, Transport and Tourism were presented and made public. JTSB did not invite the comment for the Report to the party, because a person relevant the cause of this accident has died. Comments on the draft report were invited from the flag state of DONGJIN FORTUNE.

Factual Information	
Vessel Type and Name	Container Ship, DONGJIN FORTUNE (Flag : Republic of Korea)
Gross Tonnage	7,683 tons
Vessel Number	IMO No. 9251145
Owner	DONGJIN SHIPPING CO., LTD. (Republic of Korea)
Management Company	DONGJIN SHIPPING CO., LTD. (Republic of Korea)
Classification Society	KOREAN RESISTER OF SHIPPING
L x B x D	130.36m x 20.00m x 10.70m
Material of Vessel	Steel
Engine Type, Output	Diesel Engine, 5,600kW
Date of Launch	May 22, 2002
Container Capacity	728TEU*1 (See Picture 1.)  Picture 1 - DONGJIN FORTUNE
Crew Information	Master（national of the Republic of Korea）, 47 years old Seaman's book : Issued by Republic of Korea Seaman's license : Unknown. Linesman A, 58 years old According to information from the company of contract to take the mooring lines of subject vessel (hereinafter referred to as "the Company"), linesman A was a full-time employee of the Company. At that time of this accident, he was handling the mooring lines along with 5 other linesmen.
Injuries to Person	Death of one person (Linesman A)
Damage to Vessel	None
Weather and Sea Condition	Weather : Weather - fine, Wind – west-north-west, Wind force - 4, Visibility - clear, Sea conditions : Wave height – Approximately 1.0m, Tide - Middle

*1 "TEU" is a unit which is indicated the capacity of a 20ft container, and it is an abbreviation for Twenty-foot Equivalent Unit.

	period of low tide, Tidal height – Approximately 132 cm (Komatsushima City) A strong wind advisory was issued to Komatsushima City, Tokushima Prefecture at 04:23 on November 4, 2021, and it was issued continuously at that time of this accident. According to the statement of a linesman (hereinafter referred to as "linesman B") who was handling the mooring lines on the berth along with linesman A, on the day of this accident was strong wind and the crest of the wave was washed up on the berth.
Event Leading to the Accident	According to the Automatic Identification System (AIS) information records received by a private information company (hereinafter referred to as "AIS records"), port arrival/departure notifications, the information from the company, and statement of other 2 linesmen (hereinafter referred to as "linesman C" and "linesman D") who was mooring lines work on the berth along with linesman A, the events leading to this accident were as follows; The Container Ship DONGJIN FORTUNE with master (Nationality: Republic of Korea) and 16 crew members (Nationality: 4 person's Republic of Korea and 12 person's Republic of the Philippines) on board was departure from Hanshin Port, Osaka District at early morning on November 9, 2021, and entered in area of Komatsushima District, Tokushima Komatsushima Port, Tokushima Prefecture at around 07:29. The subject vessel took a tug line to the port stern and gradually slowed down toward to the port of Akaishi area -10m berth (hereinafter referred to as the "the berth") with a plan to be berthing of starboard side. The 6 linesmen (all Japanese nationality) who were mooring lines work gathered in the company's office near this berth at around 07:30, and they held a meeting regarding the taking mooring line work and cargo handling work including confirmation of work precautions. Then, they went to the berth at around 07:40 who were wearing the safety equipment. Based on the meeting, the 6 linesmen divided into 2 groups which were each 3 linesmen on the bow side and the stern side, and the linesman A, linesman B and linesman C were in charge of bow side. At first, they confirmed to take the fore spring line[*2] of starboard side (hereinafter referred to as "this spring line") to the 4th bollard (hereinafter referred to as "this bollard") located on the approximately 70 meters west from the east end of the berth. (See Figure 1 and 4)

[*2] "Fore spring line" is a mooring line running diagonally aft from the bow of the ship. When a ship is docked, it is often used as a mooring line that is first sent to a mooring facility and moored there for the purpose of suppressing forward inertia.

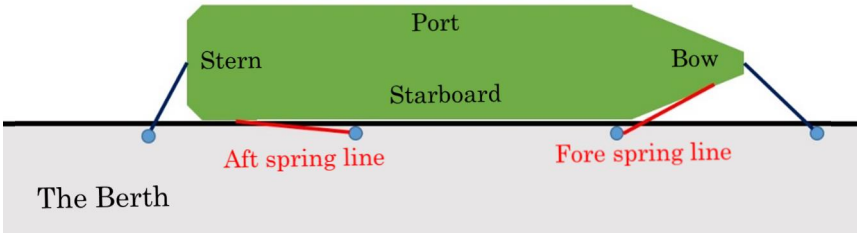


Figure 1 General methods and names for mooring lines (Image View)

The subject vessel approached to the berth in the berthing position while turning to the left off the northwest coast of the berth from around 07:42. At around 07:50, the eye (ring) part at the end of this spring line which was send through fairleader[*3] on the starboard bow was connected to this bollard by the linesman A, linesman B and linesman C. (See Figure 2 and 3)

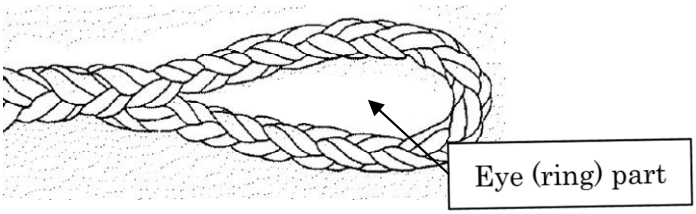


Figure 2 Schematic view of the eye (ring) part of tip of this spring line

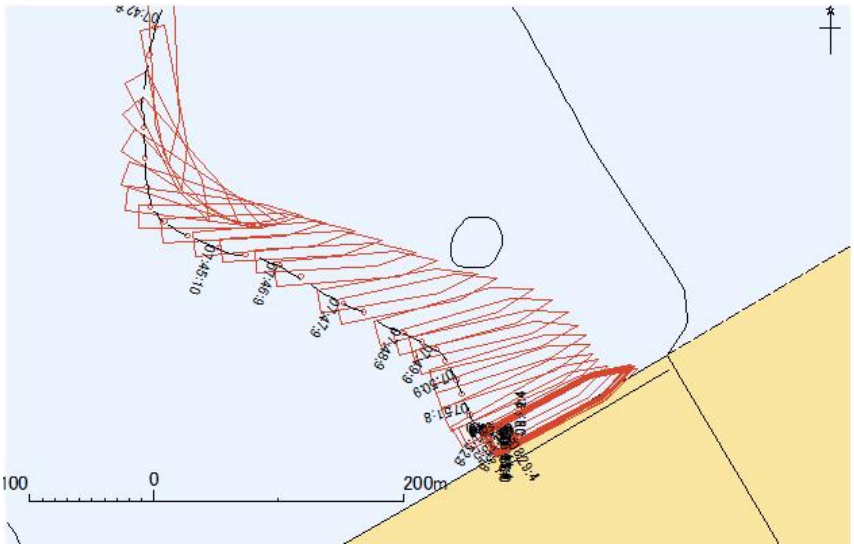


Figure 3 Ship's track of approaching to the berth.

Normally, while the fore and aft spring lines of the subject vessel are keeping appropriate tension, and the main engine and bow thruster were used to approach to the berth slowly. However, on that day, since this spring line received pressure flow by the wind, the subject vessel was to the berth before keeping the tension of this

[*3] "Fairleader" is a metal fitting such as a roller for guiding mooring lines in any direction.

spring line, and the 3 linesmen of stern side connected the eye (ring) part at the end of the aft starboard spring line to the 8th bollard located from approximately 165 meters west of the east end of the berth. After that, starboard side of the vessel was arrived ashore parallelly to the berth by using the bow thruster and one tugboat. At that time, since the vessel arrived ashore before keeping tension of this spring line, this spring line was kept slack, and it passed through below the fifth rubber fender (hereinafter referred to as "this fender") from the east end of the berth. The starboard shell plate of the subject vessel was contacted with this fender, and this spring line passed through below the contacted part. (See Figure 4.)

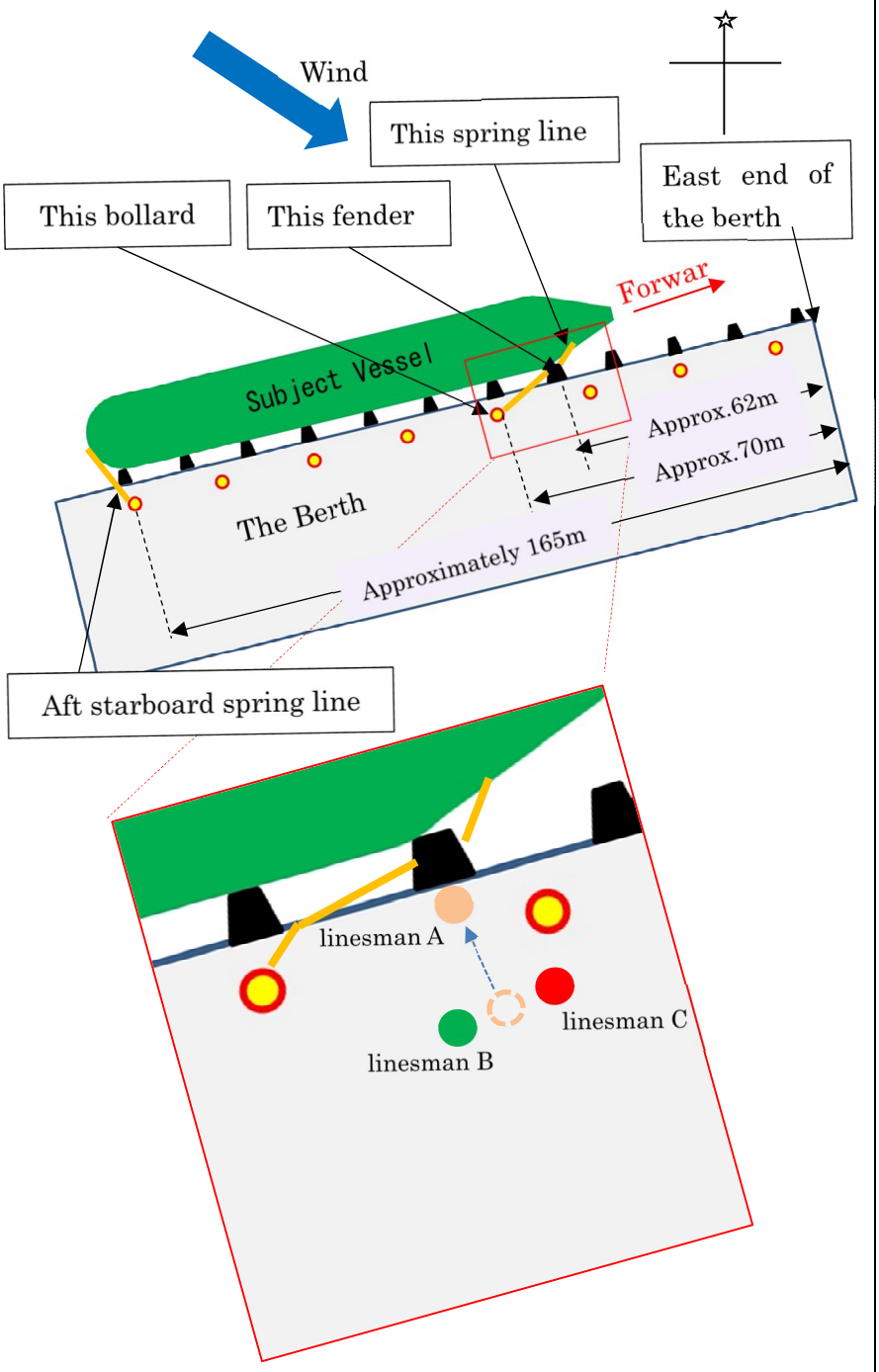


Figure 4 Situation of the berth of subject vessel

	At around 07:52, under the situation where the starboard shell plate of subject vessel was pressed against each fender due to the wind coming from the west-north-west, and the vessel used main engine and moved to forward (east) side in order to meet the location of the cargo handling equipment on shore side. At that time, the starboard shell plate of subject vessel was pressed against each fender strongly, and shell plate was friction to the fenders, and it was caused to rise smoke when the ship was moved. The linesman A, linesman B and linesman C were waiting for the next mooring line to be sent near this fender after connecting this spring line to this bollard. The tension of this spring line was increasing when the vessel was moving (to the east), and the tension of this spring line was more increasing due to catch on the underside of this fender. When this spring line was receiving tension, linesman A saw obliquely downward from near the upper edge of the berth where the fenders were installed. At that moment, this spring line which were receiving the tension came off from underside of this fender, and it bounced up and hit to linesman A's head. The linesman A was carried to the hospital in the Komatsushima city. Although he was hospitalization and he was serious condition of unconscious and continued to treat, he died at around 18:11 on 12 November, 2021. The cause of death was determined as cervical spinal cord injury, diffuse brain injury and fractures of the skull, facial bones and rib. (Appendix 1 Schematic view of accident location, Table 1 AIS Record (excerpt))
Other Matters	(1) Course of the subject vessel The subject vessel was a regular container ship that sailed between the Republic of Korea, Hanshin Port, ports in Yamaguchi prefectures and port in Oita prefectures in about a week, and it called at Tokushima Komatsushima Port, Komatsushima district, Tokushima every week. (2) Structure of the subject vessel According to the General Arrangement, the vessel is container carrier with No.1~No.6 cargo hold which navigation bridge is located on stern side. Since from end of bow to aft bulkhead of the No.1 hold corresponds to the water cutting section[*4] of the hull, the shell plate of the vessel has angle with respect to the hull centerline, and the design was different from parallel section of the structure from backward of fore bulkhead of No.2 cargo hold. Also, since bow flare[*5] of the hull is larger than

[*4] "Water cutting section" means that the water stream cutting by the bow material are followed to the hull and divides into left and right, when the vessel is navigating.
[*5] "Bow flare" is to the warping of the shell plate of the bow.

general cargo ship and the upper deck reaches almost its maximum width from the bow end to the center of the No.1 hold, the slope of water cutting section from upper deck to the bottom was greater than general cargo ship. (See Figure 5.)

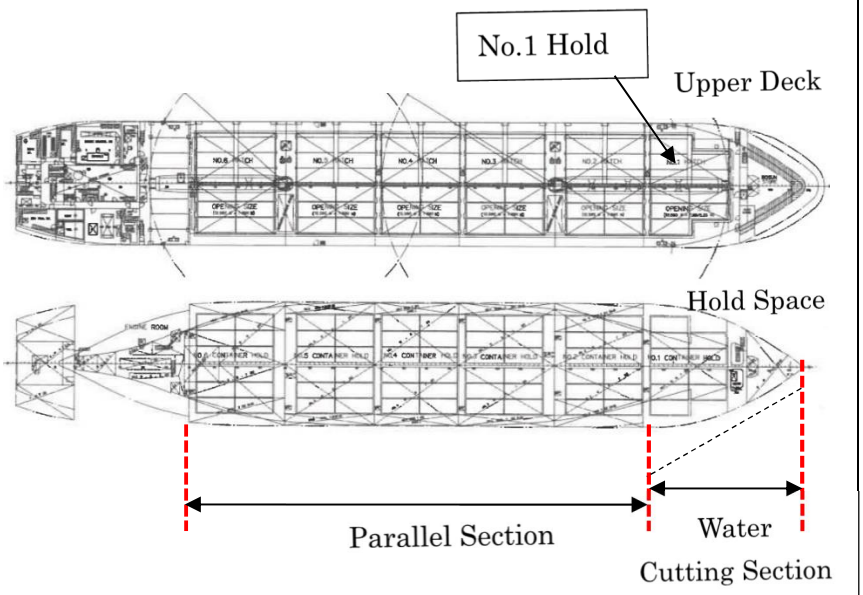


Figure 5 General Arrangement (excerpt)

(3) The state of the hull at that time of this accident

The parallel section of shell plate of subject vessel was contacted with the fenders generally vertically and evenly. However, the water cutting section of the vessel was contacted at an angle and slope with this fender which was fitted perpendicularly with berth.

(4) Regarding this spring line

This spring line was general mooring line which was made by the synthetic fiber using on the cargo ship, and the end of this spring line was eye splice*6, and the eye part was connected with this bollard.

According to the document "Knowledge of Ropes - Structure and Handling of Steel Ropes, Fiber Ropes, and Chains" (edited by the Maritime Department of Tokyo Tanker Co., Ltd. and published by Seizando Shoten Co., Ltd. in 1989), the mooring lines made by synthetic fibers have great elongation recovery which is stretches when a load is applied and returns to its original shape when the load is removed in comparison with steel mooring lines or natural fiber mooring lines. Although the elongation characteristic of synthetic fiber ropes has the

*6 "Eye splicing" is a process in which the end of a mooring line is looped to form an eye (ring), and each sland at the end of the mooring line is woven along the main cable.

effect to mitigate the impact loads, on the other hand, it is described that the speed of the rope when it slips or bounce back is extremely high and dangerous by the energy stored during elongation.

(5) Regarding this fender

This fender was made a solid rubber[*7], and it was V-shape. The vertical length of the fender which was attached to the berth was approximately 1.3m, and the height from the mounting bottom which was fitted to the berth to the protruding part toward the sea was approximately 0.6 m. The upper and lower end portions that were contacted to the upper edge of the berth were tapered[*8] with respect to the contact surface that contacts the shell plate of the vessel, and it was trapezoidal when viewed from the side.

The 12 fenders were installed at approximately 15.5m intervals at the berth. This fender was installed approximately 62 meters away from the east end of the berth, and it was 5th fender from the west. (See Figure 6 and Picture 2)

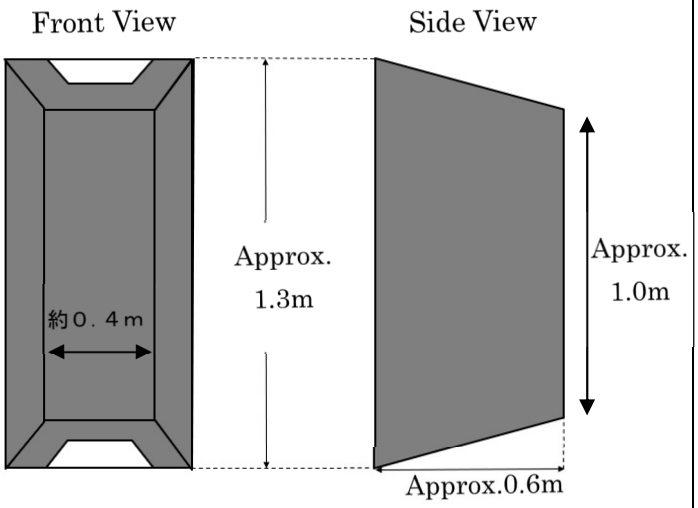
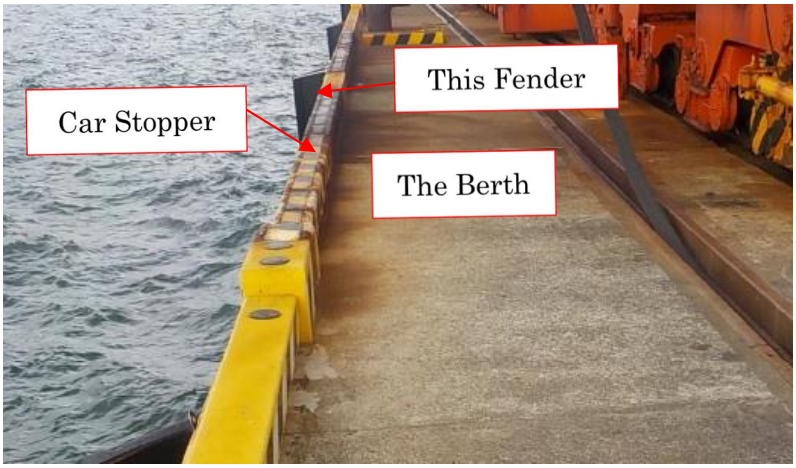


Figure 6 Imagery of the Fender

[*7] "Solid rubber fender" is a fender which absorbs the pushing press from ship when ship is berthing through elastic deformation and buckling of the rubber of the fender.
[*8] "Taper" is a shape which is the diameter, width, and thickness of a structure are tapered.



Picture 2 The dock and this fender

(6) Regarding this bollard

This bollard was cylindrical type made by steel which was the diameter of approximately 32 cm, end of this bollard was bent approximately 90 degrees toward the shore, and the maximum allowable load was approximately 500 kN.

This bollard was located approximately 36 cm on the shore side from the edge of the berth which the car stopper approximately 20 cm wide and 20 cm high was fitted. (See Figure 7.)

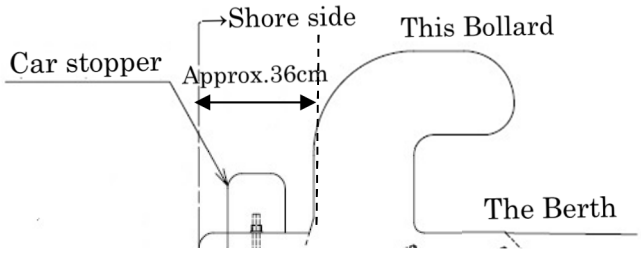


Figure 7 This Bollard

The berth had a total length of approximately 170 m and a depth of approximately 10 m. Also, the 8 bollards including this bollard were located at approximately 23.2 m intervals.

(7) Regarding the linesmen of shore

The linesman D of the 6 linesmen, was a regular clerical employee of the Company and supervisor of the linesmen. The other 5 linesmen were also all regular employees of the Company.

According to the linesman D who was supervisor of the work

	of linesman, the lineman A had experience of 10 years for the linesman and cargo handling of the shore, and he was a leader in the field work among the 6 linesmen, because he was always careful, gave warning to inexperienced linesman if they engage in unsafe behavior, and he also explained the risks in advance if there is any dangerous work. (8) Recognition of the risk for the mooring line under the condition at that time of this accident According to the statement of the linesman B and linesman C, they had never seen the situation in experience that the mooring line pass through underside of the fender, receiving the tension due to catch on it, and bounced up suddenly after coming off from the underside of the fender. Although the company had conducted the safety guidance to the linesman in the meeting prior to commencing work such as confirmed the plan of the work and precaution statement, the company had not provided in writing instructions on specific work procedures and precaution statement of at each stage of the work. They have understood that the snapback which the mooring line under tension is ruptured and bounced back, and the mooring line of tautness was released and bounced up after the mooring line catch on the obstacle and pull. However, the dangers of these events had not been specifically addressed, and the safety education and guidance had not provided. (9) The actions of linesman A at that time of this accident According to the statement of linesman C, the actions of linesman A at that time of this accident was as follows; The linesman B believed that linesman A approached to the edge of the berth immediately and looked to downward from around upper edge of the berth, because he planned to inform to the crews on subject vessel upon confirmation of this spring line which caught on the underside of this fender.
Analysis Involvement of Crew Members and others	Applicable (Linesman A)
Involvement of Vessel and Engine	Not Applicable
Involvement of Weather and Sea condition	Not Applicable
Analysis of the Findings	(1) The status of the fatality The cause of death of linesman A was determined as cervical spinal cord injury, diffuse brain injury and fractures of the skull, facial bones and rib.

(2) The status of the subject vessel

At that time of this accident, the subject vessel was berthed with starboard to the berth, this spring line was connected to this bollard, and aft starboard spring line was connected to the 8th bollard located from east end of the berth. It was curtained that the subject vessel moved to forward side under the situation where the starboard shell plate of subject vessel was pressed against each fender due to the wind coming from the west-north-west.

(3) The status of this spring line before this accident

This spring line was connected with this bollard, and then, the starboard of subject vessel was berthed to the berth before this spring line was received the tension. Since starboard shell plate contacted with this fender, it is probably that this spring line passed below lower end of this fender which was located approximately 1.3 m below the upper edge of the berth located upper end of this fender.

This spring line caught on the underside of this fender and it was pulled to downward direction. Furthermore, since this bollard was also located approximately 36cm shore side from end of the berth, it is probably that this spring line was bent towards the shore side by the car stopper which was approximately 20cm width and approximately 20cm height.(See Figure 8)

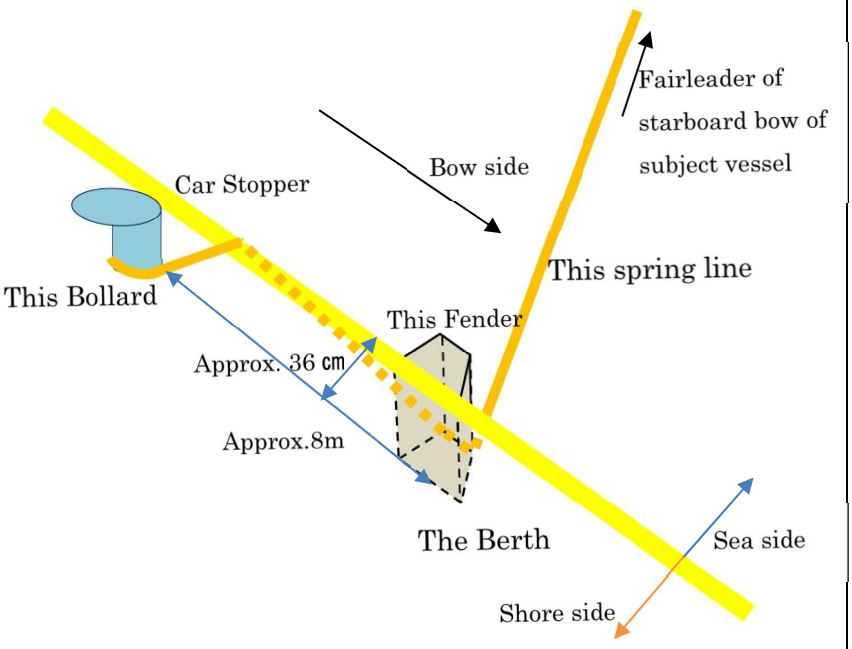


Figure 8 The status of this spring line before this accident (Image)

Since subject vessel was moved forward in order to adjust the position of the berthing, this spring line made by synthetic fiber was pulled to bow side and increased tension slowly. After that, this spring line caught on the underside of this fender which was located approximately 1.3 m below the upper edge of the berth located upper end of this fender, and it was more increased the tenson. It is probably that energy was stored which was attributed to the elasticity of the synthetic fiber of this spring line, because the strong tension was applied to both direction of subject vessel side and the berth side. (See Figure 9)

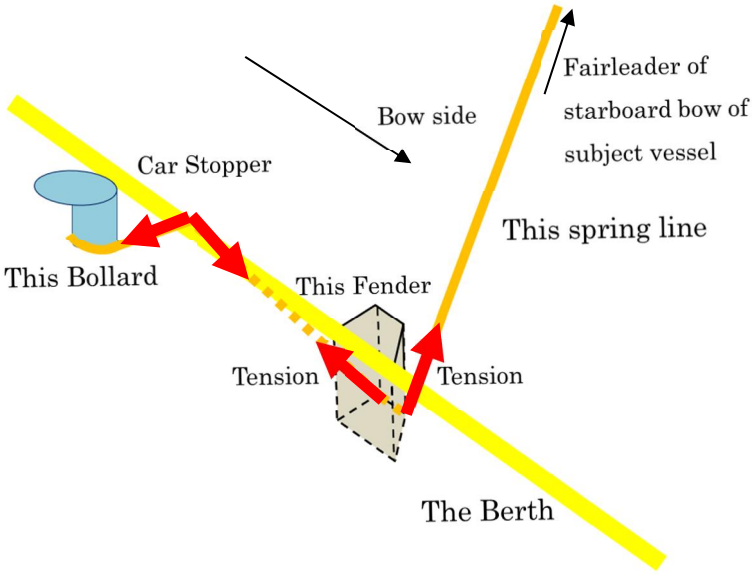


Figure 9 The energy was stored to this spring line before accident (Image)

(4) The status of bounce up of this spring line

This spring line came off from below of this fender when this spring line receiving the tension was applied to both direction of fairleader side of starboard bow of subject vessel and the berth side by point of origin from bottom of this fender. Therefore, it is probably that stored energy was released immediately and this spring line was bounced up.

Although this fender was contacted with starboard shell plate of subject vessel, this section of the starboard shell plate was water cutting section and the starboard of subject vessel which had angle and inclination was contacted with this fender. Therefore, when subject vessel was moved forward, the starboard shell plate of subject vessel got away from this fender and created a gap between the starboard shell plate and this fender. In this regard, it is probably that this spring line was

bounced up through this gap.

(5) Situation regarding the position of the linesman A

Since the linesman A stood near the upper edge of the berth and looked diagonally downward with the head bent forward in order to see the underside of this fender which this spring line caught on, it is probably that his head was entered in the area which this spring line was bounced up.

The linesman B and linesman C had never seen the situation in experience that the mooring line pass through below fender, receiving the tension due to catch on it, and bounced up suddenly after coming off from the below fender. Therefore, it is possible that the linesman A did not also have the knowledge of the risk for the status of this spring line at that time of this accident. However, since the linesman A had died, it was not possible to determine whether or not he had the knowledge of the risk for the status of this spring line.

Although the company had conducted the safety guidance to the linesman in the meeting prior to commencing work such as confirmed the plan of the work and precaution statement, they had not conducted the specific safety training and guidance for various danger of mooring work. In this regard, it is probably that the specific safety management in the field work was relied on the knowledge and experience of each linesman.

(6) Analysis regarding the time of the bounce up of this spring line

According to the AIS record, at the position north latitude 33°59'40.4"and east longitude 134°37'15.7", the speed of the subject vessel became 0 once from around 07:53:50 to 07:54:00, and then, 0.1 knot speed over the ground was recorded around 07:54:08. In this regard, this spring line came off from underside of this fender, bounced up and slacken off, furthermore, since the subject vessel moved forward a little, it was probably that forward speed was recorded.

In view of the above, it was probably that this spring line came off from underside of this fender and bounced up from 07:54:00 to 8 seconds.

(7) The analysis regarding this accident

Under wind speed was over 10m/s from west-north-west and wave was washed up on the berth, when the subject vessel was berthing operation at Komatsushima District, Tokushima Komatsushima Port, Tokushima Prefecture, this accident had occurred. The linesman A looked diagonally downward from near upper edge of the berth located this fender in order to

	confirm the status of this spring line which caught on the underside of this fender. At that moment, this spring line receiving tension was came off from below this fender and it bounced up passing through between this fender and starboard shell plate. Since linesman A's head was entered in the area which this spring line was bounced up, it is probably that this spring line hit to his head, and he was died.
Probable Causes	Under the subject vessel was berthing operation at Komatsushima District, Tokushima Komatsushima Port, Tokushima Prefecture, when this spring line caught on the underside of this fender and receiving the tension, the linesman A looked diagonally downward from near upper edge of the berth located this fender in order to confirm the status of this spring line. When this spring line came off from underside of this fender and bounced up, since linesman A's head was entered in the area that this spring line was bounced up and this spring line hit to his head, it is probably that this accident had occurred.
Safety Actions	It was probably that the following measures are useful in preventing the recurrence of similar accidents in the future. ・ The company contracting the mooring line work must conduct specific safety training to the linesman of the mooring work at shore such as inform the accident example and clearly indicating of the dangerous area, regarding the risk of snapback which the mooring line under tension is ruptured and bounced back, and risk of the mooring line of tautness was released and bounced up after the mooring line catch on the obstacle and pull. Also, during field meetings prior to work, when the mooring line is caught between the hull and the fender and the mooring line is receiving tension, specific precautions for each stage of work must be clearly indicated and strictly observed such as requiring ships leaving or arriving at the berth to loosen the mooring line. ・ The company contracting the mooring line work is advisable to decide on signals in advance, and ask your business partners to help publicize and utilize the information in order to improve the communication between crew members of docking and departing vessels and workers on shore. The company has implemented the following measures to prevent the occurrence of similar accidents. ・ Since the company has been conducted re-evaluation of the organizational structure within the company and Safety and Health Manager has been provided to each department of assuming field work, a more detailed safety management system has been established.

	・ The company organized the hand signals for mooring work (hereinafter referred to as "hand signals") in order to improve communication with the ship's side, and the documents which was described the explanation and how to use of hand signal have been distributed to the business acquaintance trough agents and requested the ship's side to use them and cooperate with us. ・ During the mooring work, the observer has been provided in addition to the lines man who are engaged in the mooring work, in order to observe the condition of work of the crew on bord ship leaving and berthing as well as overall mooring work status, communicate with ship side by hand signal, and provide necessary safety instructions. ・ The company has been created the documents of the mooring work procedure which is described specific precaution statement such as the substance and procedure of the field work, setup and function of Observer, communication with Ship side by hand signal, and the marking of the dangerous area during the work. In this regard, the company has conducted the confirmation of the substance and procedure of the field work and safety guidance by using this document in the meeting prior to commencing work. ・ The company has held a safety and health meeting once a month at each branch and each office, and provided safety guidance and education to linesman using work procedures and accident examples. ・ The company has collected various risks during field work, compile them into near-miss reports along with improvement measures, etc., and share and inform each department within the company and each field.

Appendix 1 Schematic view of accident location

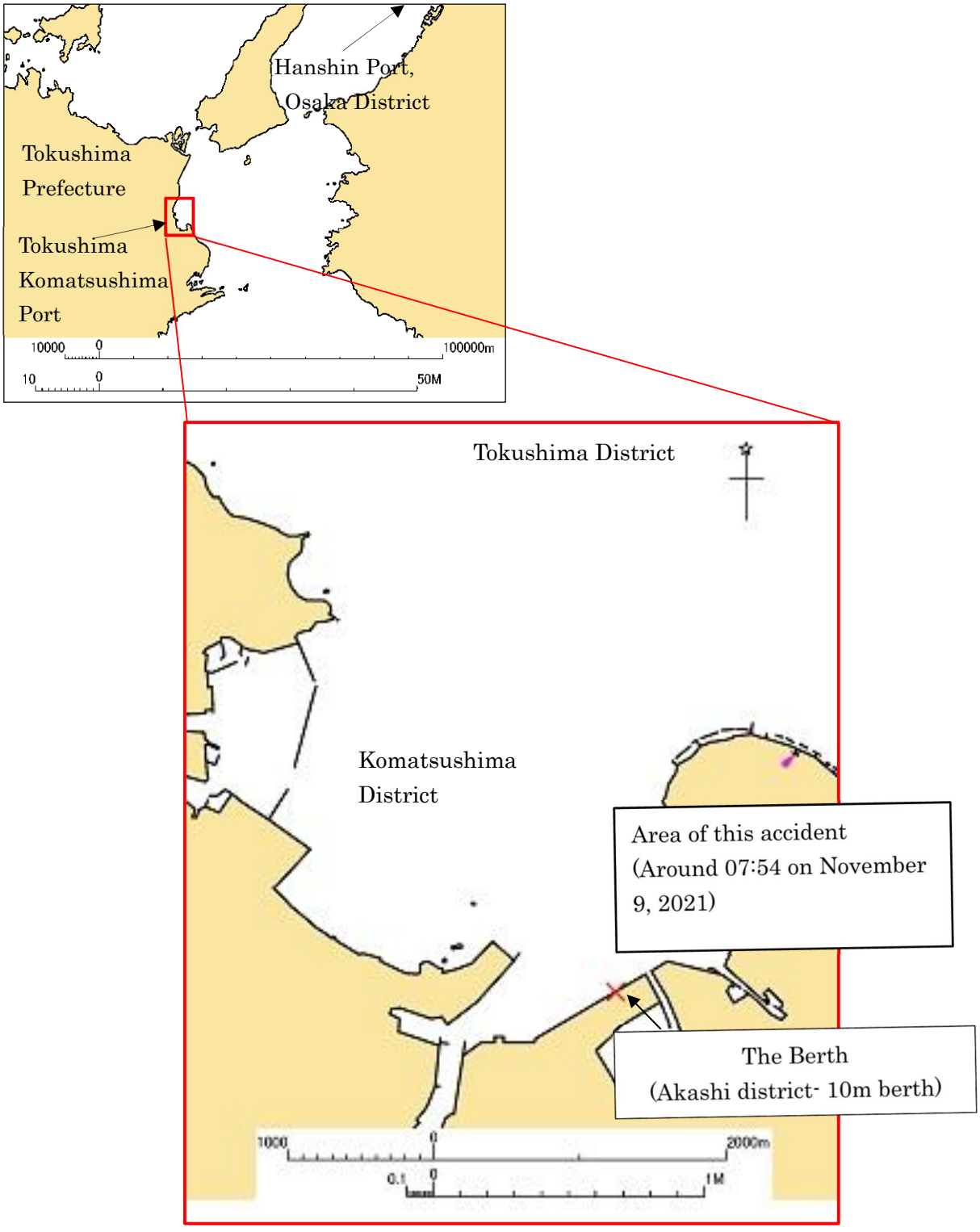


Table 1 AIS Record (excerpt)

Time (HH:MM:SS)	Position		Course Over the Ground (°)	Heading (°)	Speed Over the Ground (kn)
	Latitude (N) (°-′-″)	Longitude (E) (°-′-″)			
07:44:58	33-59-45.4	134-37-06.2	113	086	1.6
07:45:10	33-59-45.3	134-37-06.6	111	085	1.7
07:45:19	33-59-45.2	134-37-06.8	110	084	1.7
07:45:29	33-59-45.1	134-37-07.2	110	085	1.7
07:45:40	33-59-45.1	134-37-07.4	107	086	1.6
07:45:48	33-59-45.1	134-37-07.9	104	087	1.6
07:45:58	33-59-44.9	134-37-08.1	104	087	1.6
07:46:09	33-59-44.8	134-37-08.5	107	087	1.7
07:46:19	33-59-44.6	134-37-08.8	110	086	1.7
07:46:29	33-59-44.5	134-37-09.2	113	085	1.8
07:46:40	33-59-44.3	134-37-09.5	116	083	1.9
07:46:48	33-59-44.1	134-37-09.9	120	082	1.9
07:46:58	33-59-44.0	134-37-10.1	119	081	1.9
07:47:09	33-59-43.9	134-37-10.5	117	080	1.8
07:47:19	33-59-43.7	134-37-10.7	116	079	1.8
07:47:29	33-59-43.6	134-37-11.2	116	078	1.7
07:47:40	33-59-43.4	134-37-11.5	116	077	1.7
07:47:48	33-59-43.3	134-37-11.8	116	076	1.7
07:48:09	33-59-43.1	134-37-12.4	114	074	1.6
07:48:19	33-59-43.0	134-37-12.5	113	074	1.5
07:48:29	33-59-42.9	134-37-12.8	114	074	1.4
07:48:40	33-59-42.8	134-37-13.0	114	074	1.2
07:48:49	33-59-42.8	134-37-13.1	116	075	1.1
07:48:58	33-59-42.7	134-37-13.3	116	076	0.9
07:49:09	33-59-42.7	134-37-13.4	116	077	0.8
07:49:19	33-59-42.6	134-37-13.5	119	078	0.7
07:49:29	33-59-42.5	134-37-13.6	125	078	0.7
07:49:40	33-59-42.4	134-37-13.7	133	077	0.8
07:49:48	33-59-42.2	134-37-13.8	140	076	0.9
07:49:58	33-59-42.1	134-37-13.9	145	074	1.0
07:50:09	33-59-41.9	134-37-14.0	149	073	1.0
07:50:19	33-59-41.8	134-37-14.0	152	072	1.0

07:50:29	33-59-41.6	134-37-14.2	154	071	0.9
07:50:40	33-59-41.5	134-37-14.2	154	071	0.9
07:50:48	33-59-41.3	134-37-14.3	153	070	0.9
07:50:58	33-59-41.2	134-37-14.4	151	068	0.9
07:51:08	33-59-41.0	134-37-14.5	151	066	0.9
07:51:18	33-59-40.8	134-37-14.6	149	065	1.0
07:51:29	33-59-40.7	134-37-14.8	146	062	1.0
07:51:40	33-59-40.6	134-37-14.8	144	061	0.9
07:51:50	33-59-40.6	134-37-14.9	137	062	0.7
07:51:58	33-59-40.6	134-37-14.9	122	063	0.4
07:52:08	33-59-40.5	134-37-15.1	117	063	0.4
07:52:18	33-59-40.4	134-37-15.2	122	063	0.6
07:52:29	33-59-40.4	134-37-15.4	122	062	0.7
07:52:39	33-59-40.4	134-37-15.5	113	062	0.6
07:52:50	33-59-40.4	134-37-15.6	97	063	0.5
07:52:58	33-59-40.4	134-37-15.7	84	064	0.5
07:53:08	33-59-40.4	134-37-15.8	86	063	0.5
07:53:18	33-59-40.4	134-37-15.8	85	062	0.4
07:53:29	33-59-40.4	134-37-15.8	58	061	0.2
07:53:39	33-59-40.4	134-37-15.8	47	061	0.0
07:53:50	33-59-40.4	134-37-15.7	127	061	0.0
07:54:00	33-59-40.4	134-37-15.7	127	062	0.0
07:54:08	33-59-40.4	134-37-15.7	351	063	0.1
07:54:18	33-59-40.4	134-37-15.7	344	062	0.0
07:54:29	33-59-40.3	134-37-15.7	344	061	0.0
07:54:39	33-59-40.4	134-37-15.7	344	062	0.0
07:54:50	33-59-40.4	134-37-15.7	344	062	0.0
07:55:00	33-59-40.4	134-37-15.8	344	062	0.0

※ The position of the vessel is the position of the GPS antenna located on the bridge, and the GPS antenna position is 110 m from the bow, 20 m from the stern, 15 m from the port side, and 5 m from the starboard side. Also, the Course Over the Ground and Heading are true bearing.