MA2013-4

MARINE ACCIDENT
INVESTIGATION REPORT

April 26, 2013

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.

Norihiro Goto
Chairman,
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.

MARINE ACCIDENT INVESTIGATION REPORT

March 7, 2013
Adopted by the Japan Transport Safety Board
Member Tetsuo Yokoyama
Member Kuniaki Shoji
Member Mina Nemoto

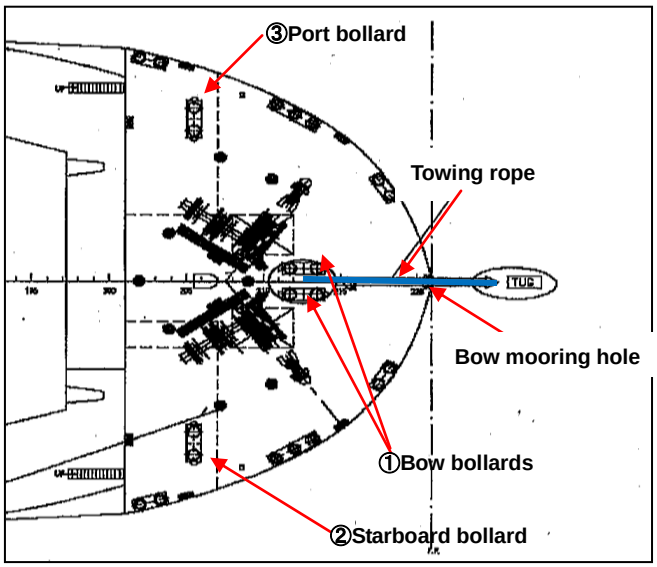
Accident Type	Injury of crew members
Date and Time	At around 1700 hours (local time, UTC+9 hours) on November 15, 2011.
Location	In the northwestern waters of Tsunoshima, Shimonoseki City, Yamaguchi Prefecture, Japan. At around 312° true bearing, 10.2 nautical miles from Tsunoshima Light House (Approximately 34°28.1′ N., 130°41.3′ E.)
Process and Progress of the Investigation	(1) Set up of the Accident Investigation The Japan Transport Safety Board appointed an investigator-in-charge from Moji Office and one other investigator to investigate this accident on November 16, 2011. (2) Comments from parties relevant to the cause of accident Comments on the draft report were invited from parties relevant to the cause of the accident. (3) Comments from the flag State Comments on the draft report were invited from the flag State of a cargo ship, CABRERA.
Factual Information Vessel type and name, Gross Tonnage, Vessel number, Owner, etc. L × B × D, Hull material, Engine, Output, Date of launch, etc.	A Cargo ship CABRERA (registered in Republic of Malta), 24,210 tons, 9537977 (IMO No.), CABRERA SHIPPING A/S (hereinafter referred to as “Company A”) 180.000 m × 29.986 m × 14.700 m, Steel, Diesel engine, 7,500 kW, November 4, 2011 (Delivered) B Tugboat Harukaze, 178 tons, 136401, Harukaze Kaiun Co., Ltd. 39.22 m × 9.80 m × 4.90 m, Steel, Diesel engine 2 units, 2,942 kW (total), October 1997
Crew Information	A Master A (Chinese) Male, 39 years old Documentary proof of application for an endorsement under STCW regulation I/10 for master (issued by Republic of Malta) Date of issue: October 20, 2011 (Valid until January 19, 2012) Officer A (chief officer) (Chinese) Male, 39 years old Documentary proof of application for an endorsement under STCW regulation I/10 for officer (issued by Republic of Malta) Date of issue: October 20, 2011

	(Valid until January 19, 2012) Ordinary Seaman A_1 (Chinese) Male, 30 years old Ordinary Seaman A_2 (Chinese) Male, 24 years old B Master B Male, 35 years old Fifth grade maritime officer (navigation) Date of issue: May 29, 2000 Date of revalidation: May 19, 2010 Date of expiry: May 28, 2015 Officer B (Vessel B first officer) Male, 25 years old Third grade maritime officer (navigation) Date of issue: May 22, 2006 Date of revalidation: April 15, 2011 Date of expiry: May 21, 2016
Injuries to Persons	A Serious injury; One person (the ordinary seaman A_1), Light injury; One person (the ordinary seaman A_2) B None
Damage to the Vessels	A None B None
Events Leading to the Accident	Vessel A, manned by the master A, officer A, ordinary seaman A_1, ordinary seaman A_2 and 19 other crew members, was built in a shipbuilding yard in Nantong Port, Jiangsu Province, People's Republic of China and delivered to Company A on November 4, 2011, after which she was originally scheduled to bound for Commonwealth of Australia, but the destination was changed to Japan. Vessel A departed Nantong Port on the 11th, and bounded for Fukuyama Port via Kanmon Strait. In order to adjust the time of entry at Fukuyama Port, Vessel A started drifting from about 2000 hours on the 12th on the high seas in the northwestern waters of Tsunoshima with her bow heading almost east. At about 0100 hours on the 15th, while Vessel A was staying adrift at approximately 34°45.2′ N, 130°26.9′ E, a rope of parachute type sea anchor of a fishing vessel engaged in squid fishing got entangled with her propellers and rudder, rendering her to be unable to sail. An arrangement was made for Vessel A to be towed by Vessel B, so she was waiting for Vessel B arranged by Company A to arrive while she continued to stay adrift with the patrol boats of Japan Coast Guard. As Vessel B arrived at about 1600 hours, the master A called Vessel B on VHF radio phone (16-channel) in order to discuss how to make fast the towing rope, but there was no response from Vessel B. The officer A, ordinary seaman A_1 and ordinary seaman A_2 as well as 6 other crew members were on standby on the forecastle deck of Vessel A to engage in the mooring operation of the towing rope. The master A decided to entrust the officer A with the discussion on the mooring operation of the towing rope with Vessel B.

The numbers and designations of bollards mounted at the forecastle deck of Vessel A are as shown in the chart below “Bollard Equipment and Designations”, and their locations are as indicated in the figure below, “Excerpt from Emergency Towing Equipment Manual.”

	No. on Figure	Number equipped	Designations below are used in this report
Emergency Towing Bollards	①	2	Bow bollard
Mooring Bollard (starboard)	②	1	Starboard bollard
Mooring Bollard (port)	③	1	Port bollard

“Bollard Equipment and Designations”



“Excerpt from Emergency Towing Equipment Manual”

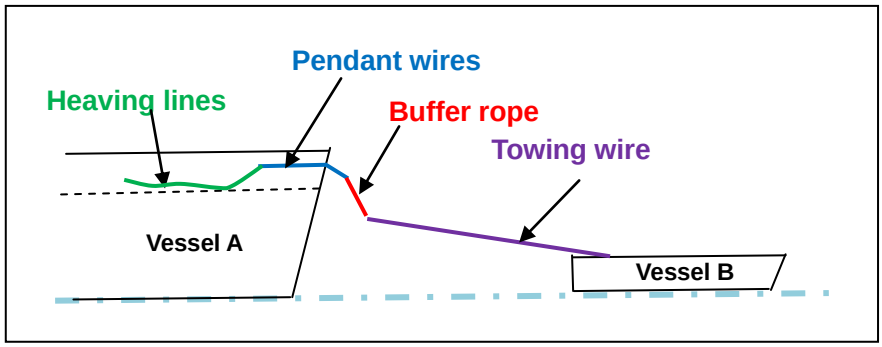
Vessel A had a practice to use the bow bollard when being towed.

Following the Emergency Towing Equipment Manual of Vessel A, the officer A intended to take the towing rope of Vessel B from the “bow mooring hole (hereinafter referred to as “bow hole”)” and to moor it at the bow bollard, so he decided to lower a rope to pick up the towing rope (hereinafter referred to as “pickup rope”) down onto Vessel B, tie 2 heaving lines of Vessel B with the pickup rope, and then tie the heaving lines with 2 pendant wires to bring them to the forecastle deck of Vessel A, so as to moor the pendant wire at the bow bollard.

The entire mooring operation of the towing rope was conducted by tying each rope and wire in order as follows:

Vessel A → pickup rope →heaving lines →pendant wires → buffer rope → towing rope → Vessel B

(See Figure below “Schematic of Towing Rope”)



“Schematic of Towing Rope”

At about 1630 hours the crew of Vessel A lowered the edge of the pickup rope (one rope) down onto the stern of Vessel B. The eye- (ring-) shaped edge of the 2 heaving lines of Vessel B were tied with the pickup rope at the edges put together.

The crew of Vessel A gave the pickup rope via the bow hole and the bow bollard in order and then hove it at the warping end of the starboard mooring winch.

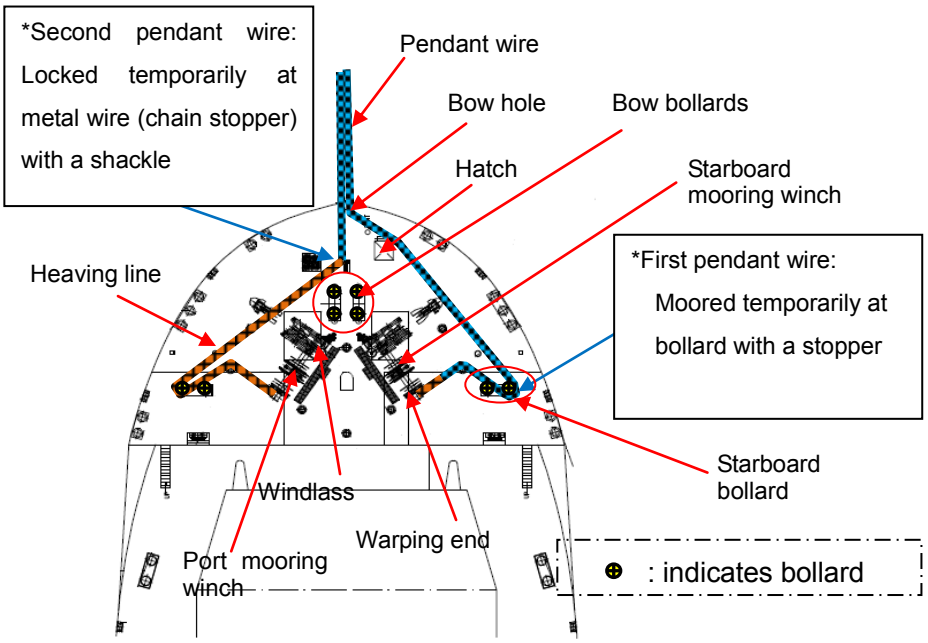
The Vessel A was instructed by the Vessel B that the 2 pendant wires were to be taken separately on the starboard side and port side, and thus they moored temporarily the eye of the first pendant wire which was sent earlier by using the rope stopper (hereinafter referred to as “stopper”), brought up the second pendant wire and temporarily moored it at the bow metal ware by using the shackle, and then untied the pickup rope to separate the two heaving lines into one to be moored at the starboard side and the other at the port side.

In order to moor the first pendant wire’s eye at the starboard bollard, the Vessel A tried to wind the heaving line leading to the said wire with the warping end of the starboard mooring winch, but the stopper which was temporarily moored could not be separated from the pendant wire, and therefore they cut off the stopper apart with a saw and started to wind up the wire.

Then the crew of Vessel A started to wind up the pickup rope tied with the heaving line of the second pendant wire with the warping end of the port mooring winch.

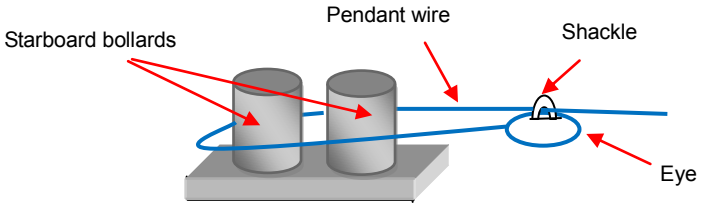
When the pendant wire’s eye being wound up with warping end of the starboard mooring winch came to a position to be moored at the bollard, but the eye’s diameter was smaller than that of the bollard, so the Vessel A decided to pass the pendant wire around the bollard and to attach a shackle to the wire’s eye.

(See Figure next, “Towing Rope Arrangement” and “Assumed Status of Pendant Wire Locking”)



"Towing Rope Arrangement"

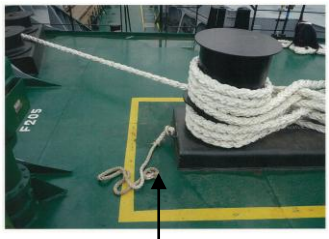
The heaving line and the pendant wire being wound with the warping end of the starboard mooring winch were in contact with the corner of the hatch located towards starboard bow of the forecastle deck.



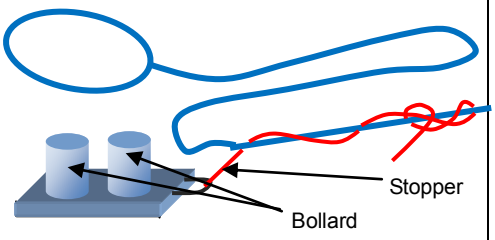
"Assumed Status of Pendant Wire Locking"

The ordinary seaman A_1 was standing right side of the starboard bollard with a backup stopper to replace the cut-off stopper, and the ordinary seaman A_2 was standing about 1 m away from the bow, while they were taking the stopper to the starboard bollard in order to moor the pendant wire temporarily at the said starboard, when, at about 17 00 hours, the heaving line was broken, and the pendant wire hit the lower leg of the ordinary seaman A_1 and A_2, knocking both of them down screaming.

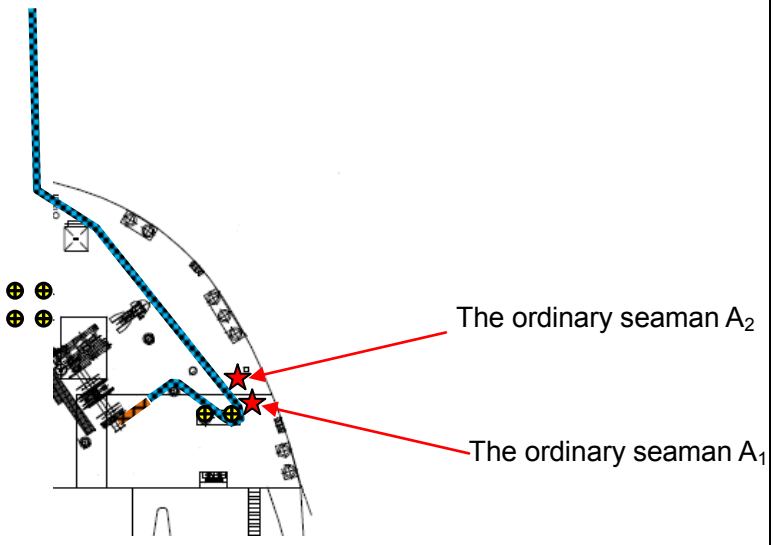
(See following Photo "Stopper," and Figures "Example of Use of Stopper," and "Location of the ordinary seaman A_1 and ordinary seaman A_2 at Time of Accident")



"Stopper"



"Example of Use of Stopper"



"Location of the ordinary seaman A_1 and ordinary seaman A_2 at Time of Accident"

The crew of Vessel A who were engaged in the mooring operation of the towing rope at the forecastle deck heard the scream and ran to the ordinary seaman A_1 and ordinary seaman A_2, and the officer A reported to the master A about the accident and then the master A requested Japan Coast Guard for rescue.

The crew working with the port mooring winch left the equipment so the pickup rope and heaving line that were being wound up with the port drum continued to be winched up as the eye of the pendant wire was temporarily moored at the metal ware since, so the heaving line was broken and fell onto the sea surface.

Vessel B, manned by the master B and 4 other crew members, arrived at the drifting location of Vessel A at about 1555 hours.

The master B received a call from the master A on VHF radio phone (16-channel) but he did not understand the language spoken, so he was maneuvering the bow of Vessel B heading southeast while keeping the oscillation caused by the waves to a minimum level so as to maintain the location near the bow of Vessel A.

The towing rope of Vessel B consisted of a buffer rope connected with a shackle to a towing wire wound at the Vessel B drum, which is then shackled to the two pendant wires.

(See "Schematic of Towing Rope" above)

	The Vessel B normally required the heaving line to be given to the towed vessel to be tied with a pendant wire, and then, in order to reduce the centrifugal whirling of the towed vessel, to provide two pendant wires both to port and starboard to be passed through fairleads separately on the port and starboard sides at the bow section of the towed vessel to be moored at a port as well as starboard bollard. As the Vessel A was heaving two heaving lines from the bow hole, the officer B tried to give them an instruction with gestures; to separate the two heaving lines to port and starboard, heave them through fairleads on the port and starboard sides at the bow section separately, separate the two pendant wires to port and starboard and to moor them separately at the port bollard and starboard bollard on Vessel A, but the crew of Vessel A did not understand it. The workers of Vessel B floated the buffer rope on the seawater and coiled the two pendant wires on the stern deck, and then stayed away from the stern to stand by at the bow while watching the heaving line to be hove to the forecastle deck of Vessel A. As the two heaving lines of Vessel A were different in length, the eyes of the pendant wires tied to each heaving line were hove one at a time with time gap from the bow hole of Vessel A. As one of the pendant wires fell onto the sea surface and the crew of Vessel A who were previously looking down from the bow disappeared at about 1700 hours, the workers of Vessel B imagined something unexpected had happened, and then at about 1710 hours, the other pendant wire which was hanging from the bow hole of Vessel A also came falling down. The Vessel B was notified from a patrol boat securing the area that crew members of Vessel A were injured, and they therefore recovered the two pendant wires which had fell down with a crane. The eye of one of the recovered pendant wires had a piece of the stopper of Vessel A attached to it. After injured the ordinary seaman A_1 was lifted up and transferred to the hospital by helicopter, the Vessel B brought her bow close to the bow of Vessel A to give a mooring rope to Vessel A, and then towed Vessel A sternway to Mutsure Hakuchi in the western seas of Shimonoseki City. The ordinary seaman A_1 suffered serious injuries such as open fracture of his left shinbone shaft, whereas the ordinary seaman A_2 sustained bruise on his left foot, respectively. Next day on the 16th, the Vessel A removed the cable of the parachute type sea anchor that got entangled at Mutsure Hakuchi.
Weather and Sea Conditions	Weather condition: Weather - Fine Wind direction - North Wind speed - about 14 to 15 m/s Visibility – Fair

	Sea condition: Wave height – about 2.5 m	
Other Information	Vessel A was equipped with red-colored metal ware that was welded and fixed towards the front of bow bollard, which was used for temporarily mooring the towing rope. The specifications of the towing ropes of Vessel B were as follows: ・Towing wire: About 56 mm in diameter and about 600 m in length ・Buffer rope: About 100 mm in diameter and about 50 m, made of polyethylene ・Pendant wire: About 46 mm in diameter and about 30 m ・Heaving line: One about 33 mm in diameter and about 45 m, the other about 30 m in length made of synthetic fibers The Vessel B crew recognized scratch damage to the heaving line that was recovered after the accident. Vessel B has been using the heaving line that was broken in this accident since its launch in October 1997. Vessel B was shaking up and down about 2 to 3 meters due to the waves.	
Analysis	Involvement of crew	A: Applicable, B: Applicable
	Involvement of hull and engine, etc	A: Not applicable, B: Not applicable
	Involvement of weather and sea conditions	A: Applicable, B: Applicable
	Analysis of findings	1. It is probable that Vessel A was towed by Vessel B to Mutsure Hakuchi in order to remove the rope of the parachute type sea anchor of a fishing boat that became entangled in the northwestern waters of Tsunoshima while she was drifting. 2. It is probable that while the Vessel A was working on the mooring of the towing rope with Vessel B in the northwestern waters of Tsunoshima, they tried to moor temporarily the pendant wire, which were picked up by heaving line rolled by warping end of the starboard mooring winch, with the starboard bollard. when the heaving line was broken and thus the pendant wire hit and injured the lower legs of the two ordinary seamen working there. 3. It is probable that the heaving line was broken due to the reasons below, but the cause could

		not be clarified as no one witnessed the situation wherein the said line was broken. ・It is possible that when Vessel B was oscillating up and down due to the waves, breaking load over the capacity was imposed on the heaving line. ・It is possible that the breaking load capacity of the heaving line had been weakened since it had been passed for about 14 years since the vessel's launch. ・It is possible that the heaving line was passed through the bow hole, instead of the starboard fairlead as planned by the Vessel B, and therefore when it was wound up with the warping end of the starboard mooring winch, it came in contact with the hatch corner in front of the starboard forecastle deck, which thus impaired the line strength.
Probable Cause	It is probable that this accident took place while the Vessel A was working on the mooring of the towing rope with Vessel B in the northwestern waters of Tsunoshima, they tried to moor temporarily the pendant wire, which were picked up by heaving line rolled by warping end of the starboard mooring winch, with the starboard bollard and attached the stopper to the said bollard, when the heaving line was broken and thus the pendant wire hit and injured the lower legs of Ordinary Seaman A_1 and Ordinary Seaman A_2 working there.	
Actions Required	The following are possible measures to prevent the recurrence of similar accidents: ・When engaging in mooring operation of towing ropes, crews of a towing boat and a towed vessel shall have full discussion on mooring method and safe towing method by giving consideration to the arrangement of mooring equipment of the towed vessel as well as using a mooring schematic, etc. ・It is advisable to inspect the towing rope properly and replace it with a new rope as needed. ・When taking a stopper, care shall be taken not to impose load on a rope of low breaking strength and to secure safety of crew members. The crew members shall engage in the work in a safe location in case the towing rope is broken. ・The operation leader shall always keep in mind the behavior of the crew members so that they do not enter the danger area. ・The operators of equipment machines shall not leave their assigned position except for compelling reasons such as approaching danger, and in the event of leaving the machines in operation, such	

	machines shall be stopped or rendered idle, which then shall be reported to the operation leader.