

MA2022-06

**MARINE ACCIDENT
INVESTIGATION REPORT**

June 30, 2022



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

Vessel type and name: Container ship SITC BANGKOK

IMO number: 9266114

Gross tonnage: 17,153 tons

Vessel type and name: Container ship RESURGENCE

IMO number: 9251169

Gross tonnage: 9,443 tons

Accident type: Collision

Date and time: Around 18:06, October 24, 2019 (local time, UTC+9 hours)

Location: Shimizu Port, Shizuoka City, Shizuoka Prefecture

Around 007° true, 370 m from the Shimizu Port Miho Breakwater North Lighthouse (approximately 35°01.6' N, 138°31.5' E)

June 1, 2022

Adopted by the Japan Transport Safety Board

Chairperson TAKEDA Nobuo

Member SATO Yuji

Member TAMURA Kenkichi

Member SODA Hisako

Member OKAMOTO Makiko

SYNOPSIS

< Summary of the Accident >

Container ship SITC BANGKOK, with her master and 18 crew members aboard, was entering the Shimizu Port, Shizuoka City, Shizuoka Prefecture, navigating the passage of the port toward the Shimizu Port Sodeshi No. 1 Wharf under the pilotage of a pilot, while container ship RESURGENCE, with her master and 16 crew members aboard, left that wharf and was departing the port toward the Busan Port, the Republic of Korea. At around 18:06, October 24, 2019, both vessels collided near the breakwater entrance between the Outer Breakwater and the Miho Breakwater.

SITC BANGKOK sustained a breach, etc. on the bow plating, and RESURGENCE sustained a dent on the starboard bow plating, but there were no casualties on either vessel.

< Probable Causes >

The JTSB concludes that the probable cause of this accident was that, it is probable that, during the nighttime in the Shimizu Port, while SITC BANGKOK was entering the port toward the Sodeshi No. 1 Wharf and RESURGENCE left the wharf and was departing toward outside of the port, the master and the pilot of SITC BANGKOK continued to enter the port, believing that SITC BANGKOK would be able to pass RESURGENCE port-side to port-side within the passage of the Shimizu Port (the Passage), whereas the master of RESURGENCE made RESURGENCE turn to port toward the Breakwater Entrance at a delayed timing, causing RESURGENCE to deviate from the Passage to the south and approach the Miho Breakwater, and then the master of RESURGENCE put the helm hard to port in order to avoid collision with the breakwater, taking a sharp turn toward the north, after which RESURGENCE sailed out of the port by crossing the Passage to the north-northeast, and consequently SITC BANGKOK and RESURGENCE collided with each other.

It is probable that the master and the pilot of SITC BANGKOK continued to enter the port, believing that SITC BANGKOK would be able to pass RESURGENCE port-side to port-side within the Passage, because they believed that RESURGENCE would sail out by using the Passage, and would not sail out by crossing the Passage to the north-northeast.

It is probable that the master of RESURGENCE made RESURGENCE turn to port toward the Breakwater Entrance at a delayed timing, due to believing that if RESURGENCE turned to port toward the Breakwater Entrance, RESURGENCE would approach the tugboat sailing on the bow of the SITC BANGKOK in a manner that her starboard stern would collide with the tugboat, and the master continued to con the vessel while focusing attention on the tugboat's movements.

The fact that reconfirmation on the order of entry and departure was not made when SITC BANGKOK started to enter the port by using the Passage were likely involved in the occurrence of the accident.

1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

Container ship SITC BANGKOK, with her master and 18 crew members aboard, was entering the Shimizu Port, Shizuoka City, Shizuoka Prefecture, navigating the passage of the port toward the Shimizu Port Sodeshi No. 1 Wharf under the pilotage of a pilot, while container ship RESURGENCE, with her master and 16 crew members aboard, left that wharf and was departing the port toward the Busan Port, the Republic of Korea. At around 18:06, October 24, 2019, both vessels collided near the breakwater entrance between the Outer Breakwater and the Miho Breakwater.

SITC BANGKOK sustained a breach, etc. on the bow plating, and RESURGENCE sustained a dent on the starboard bow plating, but there were no casualties on either vessel.

1.2 Outline of the Accident Investigation

1.2.1 Setup of the Investigation

On October 25, 2019, the Japan Transport Safety Board appointed an investigator-in-charge and two other marine accident investigators to investigate this accident.

1.2.2 Collection of Evidence

October 26, 2019: On-site investigation and interviews

November 11 and 16, 2019, October 6 and November 5, 2020, and July 30, 2021:
Collection of questionnaires

November 15, 2019: On-site investigation and collection of questionnaires

November 28 and December 5, 2019, October 13, 2020, and February 24, 2021:
Interviews

December 4, 2019: On-site investigation

1.2.3 Comments from Parties Relevant to the Cause

Comments on the draft report were invited from parties relevant to the cause of the accident.

1.2.4 Comments from the Flag States

Comments on the draft report were invited from the flag state of SITC BANGKOK and the flag state of RESURGENCE.

2 FACTUAL INFORMATION

2.1 Events Leading to the Accident

2.1.1 The Navigation Track According to the Automatic Identification System

According to the “records of the automatic identification system^{*1} (AIS) data received

^{*1} An “automatic identification system” (AIS) means a device used by each ship to automatically transmit

by a private data company” (hereinafter referred to as “the AIS record”), the navigation tracks of SITC BANGKOK (hereinafter referred to as “Vessel A”) and RESURGENCE (hereinafter referred to as “Vessel B”) from around 17:50 to around 18:07, October 24, 2019, were as respectively shown in Tables 1 and 2 below.

The positions of Vessel A and Vessel B are based on the position of the GPS antenna attached to the upper side of the respective bridge. The attached position was 136 m from the bow, 36 m from the stern, 22 m from the port side, and 6 m from the starboard side for Vessel A, and 128 m from the bow, 12 m from the stern, 15 m from the port side, and 8 m from the starboard side for Vessel B.

The courses over the ground and the headings are indicated in true bearings.

Table 1 AIS Record of Vessel A (Excerpt)

Time (hr:min:sec)	Ship's position		Heading (°)	Course over the ground (°)	Speed over the ground*2 (knots (kn))
	Latitude (N) (°-1-11)	Longitude (E) (°-1-11)			
17:50:01	35-01-01.8	138-33-13.8	352	347.2	2.6
17:50:54	35-01-04.4	138-33-13.0	337	338.6	3.4
17:51:54	35-01-07.4	138-33-09.9	335	320.0	4.6
17:52:54	35-01-12.2	138-33-05.8	335	324.9	6.5
17:53:53	35-01-17.9	138-33-01.2	334	325.7	6.7
17:55:01	35-01-24.1	138-32-55.6	315	317.9	6.5
17:56:01	35-01-27.9	138-32-49.3	293	297.0	6.4
17:57:01	35-01-29.3	138-32-41.5	286	278.6	6.6
17:58:01	35-01-29.9	138-32-33.4	289	275.6	6.7
17:59:05	35-01-31.0	138-32-25.7	290	279.8	6.3
18:00:05	35-01-32.2	138-32-18.4	290	280.9	6.2
18:01:01	35-01-33.4	138-32-11.0	290	280.9	6.0
18:02:03	35-01-34.5	138-32-03.9	285	279.0	6.0
18:03:01	35-01-35.2	138-31-56.8	285	277.8	5.9
18:04:05	35-01-36.0	138-31-49.3	290	282.0	5.8
18:05:11	35-01-37.6	138-31-41.7	274	282.4	5.6
18:06:05	35-01-37.5	138-31-36.2	277	265.8	4.9
18:06:13	35-01-37.4	138-31-35.4	280	263.4	4.3
18:06:31	35-01-37.2	138-31-34.1	299	247.8	2.5
18:06:59	35-01-37.0	138-31-33.4	316	238.2	1.2
18:07:04	35-01-36.9	138-31-33.3	318	228.0	1.3

Table 2 AIS Record of Vessel B (Excerpt)

information on the ship's identification code, type, name, position, course, speed, destination, and navigational status, and receive such information of other ships for exchanging information with other ships or with land-based navigation aids.

*2 “Speed over the ground” means the speed of a ship measured with reference to one spot on the earth's surface, whereas the speed of a ship measured with reference to the water on which the ship is floating is called “speed through the water.”

Time (hr:min:sec)	Ship's position		Heading (°)	Course over the ground (°)	Speed over the ground (kn)
	Latitude (N) (°-1-")	Longitude (E) (°-1-")			
17:50:10	35-02-13.2	138-30-28.1	167	095.6	0.5
17:51:10	35-02-13.1	138-30-28.7	167	097.4	0.6
17:52:17	35-02-13.0	138-30-29.3	161	134.4	0.3
17:52:51	35-02-12.8	138-30-29.4	161	134.6	0.4
17:54:08	35-02-11.4	138-30-29.9	156	171.6	2.0
17:55:09	35-02-08.8	138-30-31.0	155	157.4	3.2
17:56:06	35-02-04.7	138-30-33.1	155	155.8	5.2
17:57:06	35-01-59.1	138-30-36.3	156	155.3	6.6
17:58:06	35-01-52.5	138-30-39.9	155	155.5	7.5
17:59:17	35-01-44.2	138-30-45.1	143	146.9	8.0
18:00:00	35-01-39.9	138-30-48.9	143	143.9	8.3
18:00:31	35-01-36.3	138-30-51.8	138	146.3	8.6
18:01:00	35-01-32.9	138-30-55.0	131	137.8	8.5
18:01:38	35-01-28.9	138-31-00.2	129	131.6	8.5
18:02:10	35-01-25.9	138-31-03.8	119	135.5	8.5
18:02:33	35-01-24.0	138-31-06.9	108	124.8	7.9
18:03:10	35-01-21.7	138-31-11.9	085	114.8	7.6
18:03:27	35-01-21.1	138-31-14.9	069	101.4	7.1
18:03:43	35-01-21.0	138-31-16.6	059	092.8	6.7
18:04:01	35-01-21.3	138-31-19.2	044	079.2	6.2
18:04:16	35-01-22.0	138-31-21.0	036	062.1	6.0
18:04:31	35-01-23.0	138-31-22.4	033	047.6	6.2
18:04:46	35-01-24.0	138-31-23.7	027	048.4	6.9
18:05:03	35-01-25.8	138-31-25.5	016	034.3	7.3
18:05:16	35-01-27.5	138-31-26.2	017	019.0	7.6
18:05:27	35-01-28.9	138-31-26.8	017	019.2	8.2
18:05:38	35-01-30.3	138-31-27.4	016	019.0	8.4
18:06:10	35-01-33.9	138-31-29.0	008	018.3	7.6
18:06:16	35-01-35.0	138-31-29.3	004	016.1	7.0
18:07:02	35-01-38.4	138-31-29.6	343	357.2	4.0

2.1.2 Information on Voice Communication, etc., Recorded by the Voice Data Recorders

According to the records of the voyage data recorders^{*3}(hereinafter referred to as “the VDR”) installed on Vessel A and Vessel B, the bridge audios of Vessel A and Vessel B from around 17:53 to around 18:07, October 24, 2019, are as respectively shown in Tables 3 and 4.

^{*3} A “voyage data recorder” (VDR) means a device that can record a ship’s position, course, speed, radar information, and other data related to navigation, as well as communications by VHF radiotelephone and voice communication on the bridge.

Meanwhile, the radar image display records of Vessel B are as shown in Figures 1 to 5, and the direction and distance of tugboat HOEIMARU which provided unberthing assistance to Vessel B is referred to as “Vessel C,” as seen from Vessel B and the position of Vessel C estimated based on the radar image display records are as shown in Table 5.

Hereinafter, a cargo vessel that was entering the port at the time of the accident is referred to as “Vessel D,” a tugboat which provided berthing assistance to Vessel A is referred to as “Vessel E,” Vessel A’s master, officer, ordinary seaman, and pilot are respectively referred to as “Master A,” “Officer A,” “Ordinary Seaman A,” and “Pilot A,” Vessel B’s master, officer, engineer, and ordinary seaman are respectively referred to as “Master B,” “Officer B,” “Engineer B,” and “Ordinary Seaman B,” and Vessel C’s master is referred to as “Master C.”

Table 3 VDR Audio of Vessel A (Excerpt) Voices in Japanese are translated into English and shown in italics.

Time	Audio
17:53:00	Master A: Slow ahead.
17:53:14	Pilot A: Good evening. Trainee on Board. He is trainee.
17:53:46	Pilot A: Port 15. Ordinary Seaman A: Port 15.
17:53:53	Pilot A: Bow thruster is good condition ?
17:53:59	Master A: Bow thruster, condition is good. I know stand by.
17:54:14	Pilot A: Speed now ? Master A: Speed is now 6.6. Pilot A: OK. Master A: I just slow ahead. Pilot A: All right.
17:54:38	Pilot A: One tugboat. Make [unclear] starboard quarter. Master A: OK.
17:54:54	Pilot A: Hey captain, <i>Vessel C is calling.</i>
17:54:58	Pilot A: <i>Yes, Vessel C ?</i>
17:55:00	Vessel C: <i>An outbound vessel from Sodeshi [unclear] has unberthed, and is soon leaving the slip.</i>
17:55:07	Pilot A: <i>OK. Thank you.</i>
17:55:20	Pilot A: Speed is ? Master A: Speed, 6.5. Pilot A: 6.5, OK. Thank you.
17:57:19	Pilot A: Dead slow, please.
17:57:28	Pilot A: 290.
17:57:52	Pilot A: <i>Tugboat, what's the position of the inbound vessel?</i>
17:58:00	Vessel E: <i>Soon reaching the lighthouse.</i>
17:58:05	Pilot A: <i>I mean the inbound vessel. The inbound vessel from Tagonoura.</i>
17:58:16	Master A: Bow thruster, OK.
17:58:37	Pilot A: <i>She has started coming out now.</i>

17:59:26	Vessel E: <i>The inbound vessel has already berthed at Ejiri No. 1.</i>
17:59:30	Pilot A: <i>She has entered first, already.</i>
17:59:32	Vessel E: <i>Yes. She has entered first.</i>
17:59:34	Pilot A: <i>Yes. OK.</i>
18:00:53	Pilot A: 285.
18:01:00	Pilot A: Stand by picking up tag line, please.
18:01:03	Master A: OK.
18:01:04	Pilot A: OK. This is our tugboat.
18:01:05	Master A: OK. I will already stand by.
18:01:05	Pilot A: All right. Thank you.
18:01:34	Pilot A: <i>Isn't she going way too far on that side ?</i>
18:01:39	Pilot A: <i>Where is she heading?</i>
18:01:47	Pilot A: <i>She might not make the turn and come charging this way.</i>
18:01:55	Ordinary Seaman A: 285.
18:01:57	Pilot A: Thank you.
18:02:03	Pilot A: <i>She's not slowing down. That's dangerous.</i>
18:02:15	Pilot A: <i>That's dangerous. She's going toward the tugboat.</i>
18:02:46	Pilot A: <i>Hey, hey, hey, hey.</i>
18:02:57	Pilot A: <i>She'd better go full astern.</i>
18:03:01	Pilot A: 290.
18:03:43	Pilot A: <i>Hey, hey.</i>
18:03:53	Pilot A: Midship.
18:03:57	Pilot A: Port 15.
18:04:01–07	[Whistle sound]
18:04:11	Pilot A: Hard Port.
18:04:20	Pilot A: <i>Has she stopped? She must go full astern.</i>
18:04:35–38	[Whistle sound]
18:04:48	Pilot A: <i>Ah. She's going astern.</i>
18:04:51	Pilot A: Midship.
18:04:59	Pilot A: Slow ahead.
18:05:00–04	[Whistle sound]
18:05:12	Pilot A: Full ahead.
18:05:16	Master A: Oh, no.
18:05:20	Pilot A: Ah. Stop engine.
18:05:23	Pilot A: Full astern.
18:05:31	[Whistle sound]
18:05:35	Pilot A: Midship.
18:05:49	Pilot A: Bow thruster start up. Full to starboard.
18:06:00	Pilot A: <i>Why is she coming to hit? She should stop.</i>
18:06:13	Pilot A: <i>Oh. We're hit.</i>
18:06:14–19	[Impact sound]
18:06:25	Pilot A: Stop engine.

18:06:28	Pilot A: Ah. Full astern. Full astern.
18:06:36	Pilot A: <i>Oh, man !</i>
18:06:56	Pilot A: <i>Pilot boat, please contact the Coast Guard Office via the signal station.</i>
18:07:11	Pilot A: Stop engine.
18:07:18	Pilot A: Bow full to port.
18:07:41	Pilot A: Captain, check the fore part. Master A: Ya, ya.

Table 4 VDR Audio of Vessel B (Excerpt)

Time	Audio
17:54:44	Master B: Slow ahead.
17:59:06	Master B: 143 steady.
17:59:53	Master B: Port 10.
18:00:36	Master B: Midship.
18:00:40	Master B: Steady.
18:00:48	Master B: [In Tagalog] Report whether the crossing had completed, and the bow has been cleared.
18:01:31	Master B: Port 10.
18:01:33	Master B: Dead slow ahead.
18:01:36	Master B: Hard port.
18:01:57	Master B: Port 10.
18:02:12	Master B: Midship.
18:02:15	Master B: Steady.
18:02:21	Master B: Hard port.
18:02:26	Master B: Slow ahead.
18:02:36	Master B: Midship. Hard port. Hard port. Hard port.
18:03:47	Master B: Half ahead.
18:03:54	Master B: Midship.
18:04:00–07	[Whistle sound]
18:04:07	Master B: Steady.
18:04:15	Master B: Port 20.
18:04:20	Master B: Hard port.
18:04:32	[Sound of alarm of navigation equipment]
18:04:34–39	[Whistle sound]
18:04:39	Master B: Midship.
18:04:45	Master B: Steady.
18:05:00–06	[Whistle sound]
18:05:00	Master B: Port 10.
18:05:20	Master B: Hard starboard.
18:05:22	Master B: Stop engine.

18:05:27	Master B: Midship.
18:05:29	Master B: Hard port.
18:05:34-51	[Whistle sound]
18:05:37	Master B: Port 10.
18:05:40-45	[Ringing sound of telephone]
18:05:51	Master B: Hard port. Go astern.
18:06:15	Master B: Collision.
18:06:44	Master B: Stop engine.
18:07:20	Master B: Shimizu port radio. This is RESURGENCE. I have collision with SITC vessel because he comes very close. I am not yet clear the breakwater.

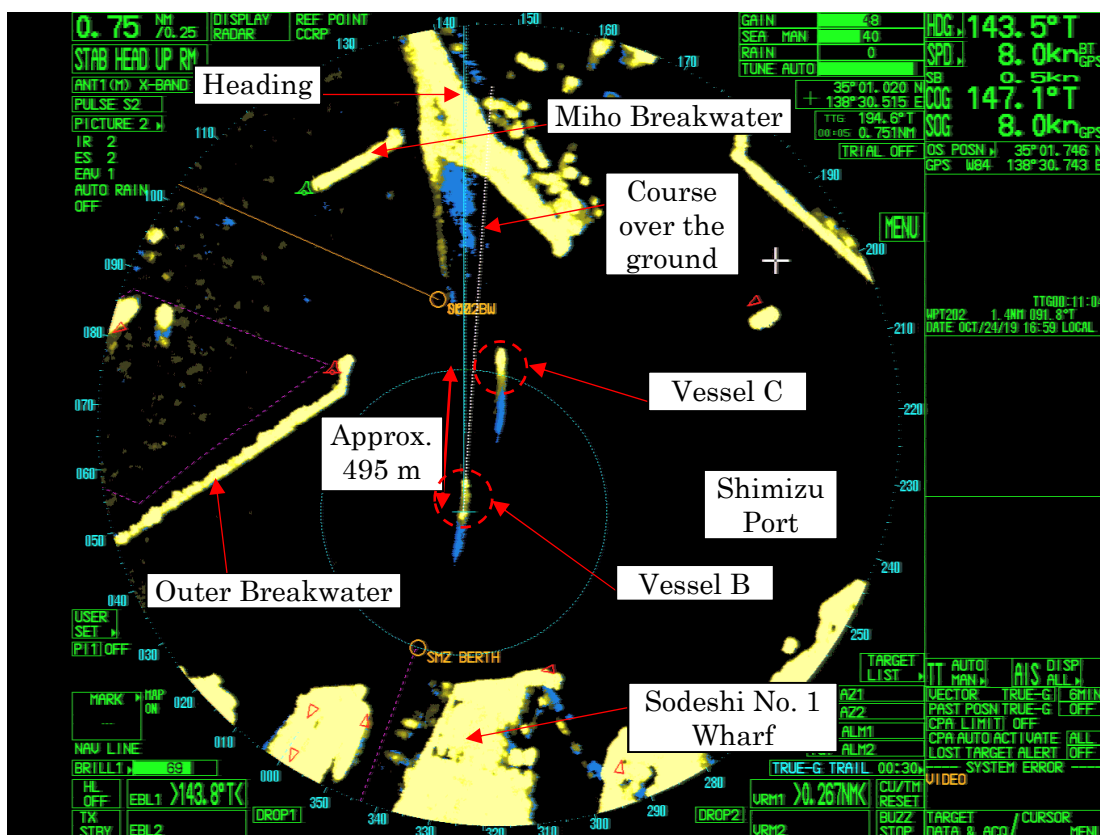


Figure 1 Vessel B's Radar Image at Around 17:59:12

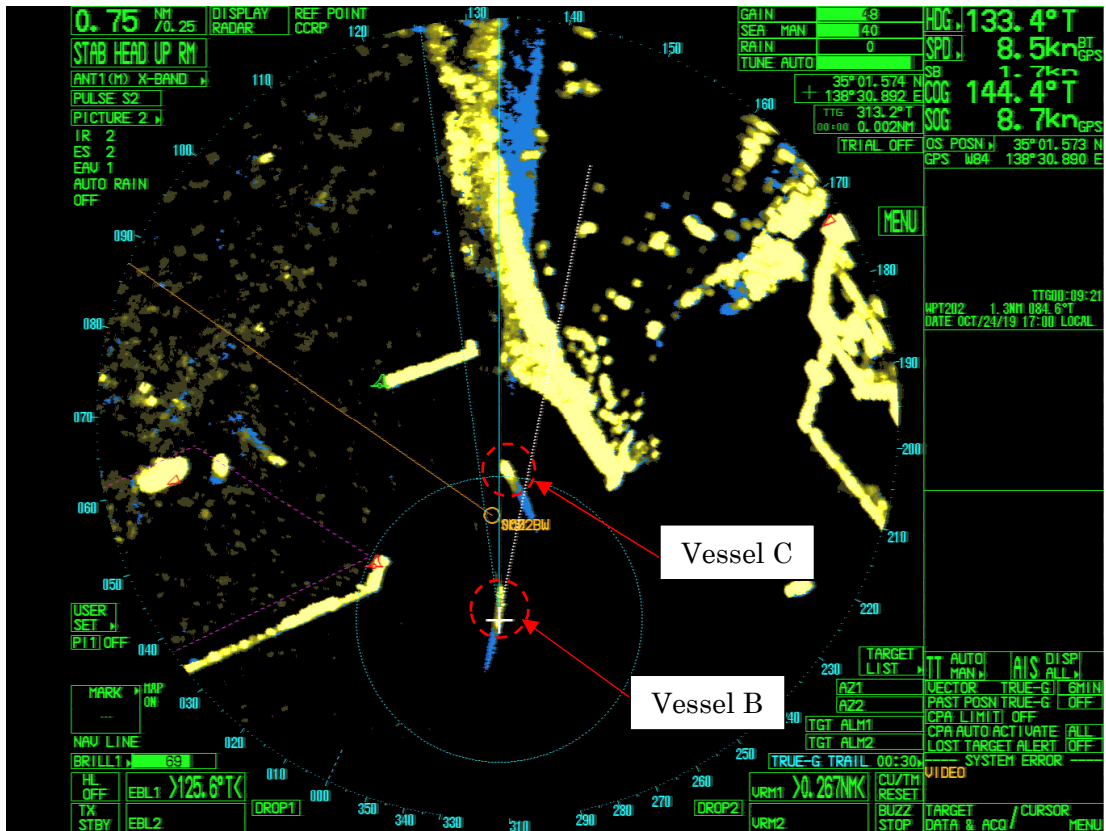


Figure 2 Vessel B's Radar Image at Around 18:00:42

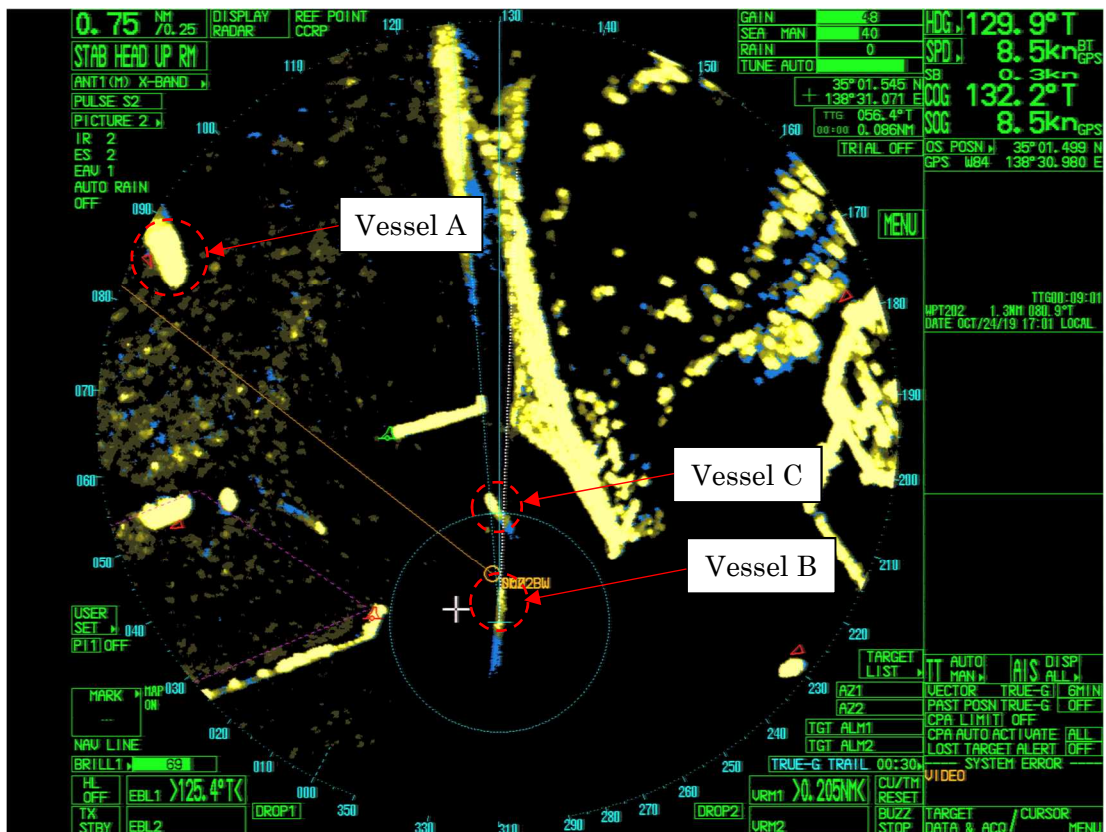


Figure 3 Vessel B's Radar Image at Around 18:01:27

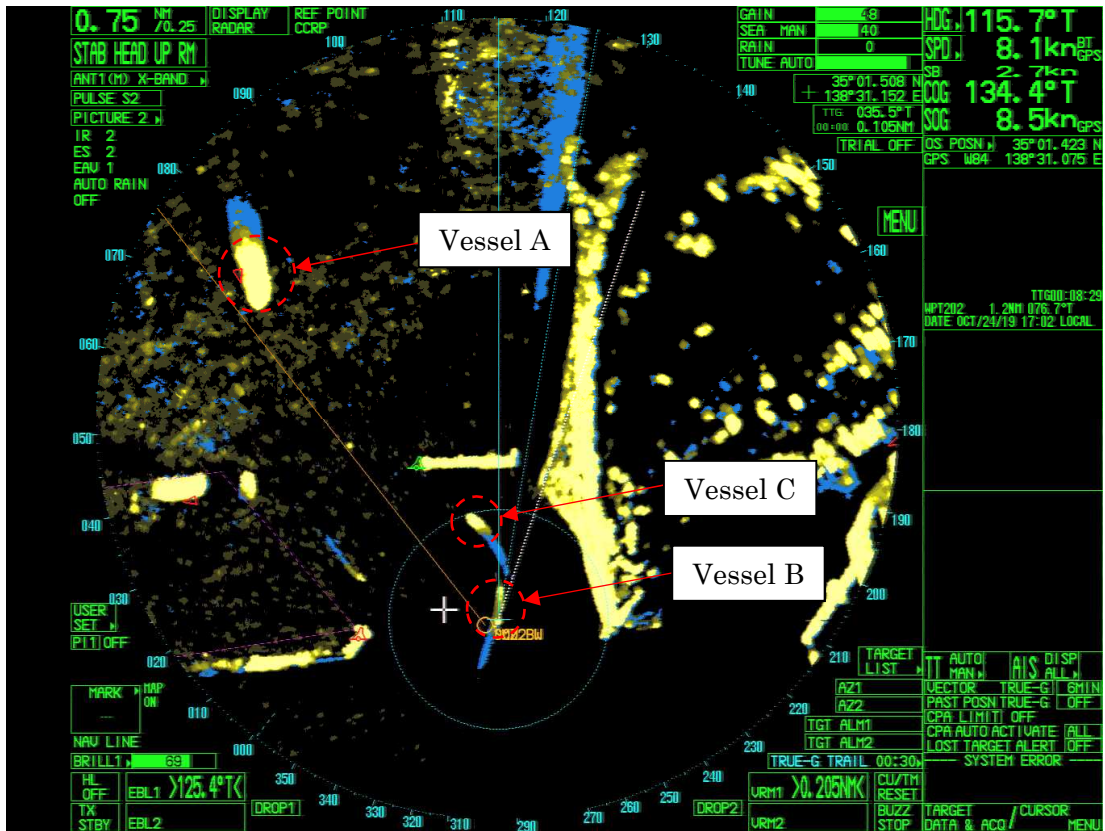


Figure 4 Vessel B's Radar Image at Around 18:02:12

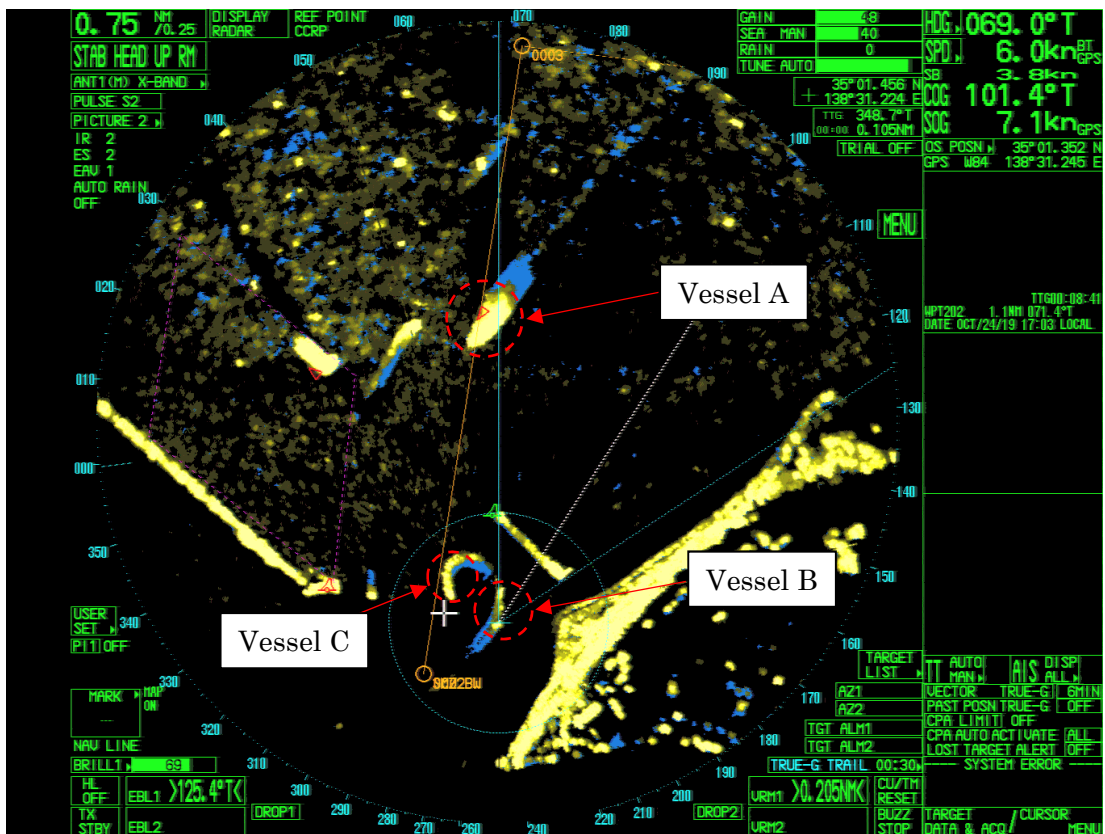


Figure 5 Vessel B's Radar Image at Around 18:03:27

Table 5 Direction and Distance of Vessel C as seen from Vessel B, and Position of Vessel C Estimated based on Vessel B's Radar Image Display Records (Excerpt)

Time (hr:min:sec)	Direction and Distance of Vessel C as Seen from Vessel B		Position of Vessel C	
	Bearing (°)	Distance (m)	Latitude (N) (°-1-")	Longitude (E) (°-1-")
17:59:12	157	537.5	35-1-28.7	138-30-52.9
17:59:27	155	567.2	35-1-26.6	138-30-55.4
17:59:42	152	565.1	35-1-25.3	138-30-57.9
17:59:57	148	581.7	35-1-23.7	138-31-01.1
18:00:12	145	573.3	35-1-22.7	138-31-03.4
18:00:27	141	544.6	35-1-22.6	138-31-05.3
18:00:42	136	523.1	35-1-22.2	138-31-07.7
18:00:57	133	480.4	35-1-22.1	138-31-08.9
18:01:12	130	438.0	35-1-22.2	138-31-10.1
18:01:27	126	415.5	35-1-22.0	138-31-12.1
18:01:42	120	380.0	35-1-22.4	138-31-13.7
18:01:57	111	380.0	35-1-22.5	138-31-16.7
18:02:12	102	343.8	35-1-23.1	138-31-17.8
18:02:27	092	335.9	35-1-23.7	138-31-19.7

2.1.3 Process of Navigational Adjustments by the Shimizu Shipping Information Center (Excerpt)

According to the reply to the questionnaire by the Shimizu Shipping Information Center and statements of Pilot A, the process of navigational adjustments was as follows.

Time	Communication
Around 15:26	The Shimizu Shipping Information Center informed Vessel A by radiotelephone that, as Vessel B's planned time of departure was delayed to 17:30, Pilot A was to board Vessel A at 18:00.
Around 16:51	The Shimizu Shipping Information Center informed Vessel B by radiotelephone that a pilot was to board Vessel A at 18:00, but that Vessel B was to depart first. The Center also requested Vessel B to notify the Center at the time of single up*4.
Around 16:53	The Shimizu Shipping Information Center informed Pilot A that, as Vessel B's departure time was changed to 17:30, the time for Pilot A to board Vessel A became 18:00.
Around 17:24	The Shimizu Shipping Information Center called Pilot A's office by phone, and told Pilot A that it was 30 minutes before the pilot was to board Vessel A, and that Vessel B seemed to have completed cargo handling as the gantry crane was boomed up, but the vessel had not departed yet. As for information on other vessels, the Center told Pilot A that it had instructed Vessel D, an inbound vessel bound for the Ejiri Wharf, to wait for Vessel B's departure near the quarantine

*4 "Single up" means to cast off all mooring lines except for one at each end of the ship, and be ready for unberthing immediately.

	anchorage and to enter the port as soon as Vessel B departed, and requested Pilot A that Vessel A should enter the port after that.
Around 17:36	As Vessel D was already approaching a position about 2 nautical miles (M) away from the breakwater, and Vessel B's departure was delayed, the Shimizu Shipping Information Center judged that Vessel D, which was bound for the Ejiri Wharf and was to proceed in a different direction from Vessel B, could enter the port first before Vessel B's departure, and instructed Vessel D by radiotelephone to enter the port first.
Around 17:38	The Shimizu Shipping Information Center contacted Pilot A's pilot boat, and informed Pilot A that Vessel B was taking a long time to put away the gangway, and had yet to be unberthed. The Center also told Pilot A that it made Vessel D enter the port before Vessel B's departure. Boat man informed Pilot A that Vessel B had yet to be unberthed.
Around 17:45	The Shimizu Shipping Information Center was notified by Vessel B that it had singled up by radiotelephone. The Center provided information to Vessel B that two inbound vessels were waiting outside the breakwater.

2.1.4 Events Leading to the Accident based on Statements, etc. of the Crew, etc.

According to the statements of Master A, Pilot A, Master B, and Master C and the reply to the questionnaire by Master B, the events leading to the accident were as follows.

(1) Vessel A

Vessel A, with her master and 18 crew members aboard, left the Nagoya Port, Aichi Prefecture, and sailed toward the Shimizu Port Sodeshi No. 1 Wharf.

As Vessel B's departure was delayed from schedule, Pilot A believed that Vessel A needed to enter the port with an adjusted time of entry. Accordingly, Pilot A headed to a point 900 m to the southeast of the usual boarding point so that the sailing distance after boarding Vessel A would be longer.

After Vessel A arrived at a point about 1.5 M to the east-southeast of the Shimizu Port Miho Breakwater North Lighthouse, Pilot A and a pilot trainee boarded Vessel A at around 17:50.

Vessel A started to proceed northwest toward the eastern end of the passage of the Shimizu Port (hereinafter referred to as "the Passage"), with her statutory navigation lights turned on, Master A conning the vessel, and Officer A and Ordinary Seaman A assigned respectively to the main engine remote control system and the steering system, under the pilotage of Pilot A.

As Pilot A believed that Vessel A would pass Vessel B outside the port if its speed was controlled, and did not want to consume time waiting for Vessel B's departure at the boarding point, Pilot A had Vessel A continue to enter the port at a speed slower than the normal entry speed by using the main engine as slow ahead.

Master A and Pilot A sighted Vessel B's port lights behind Vessel C, and believed that Vessel B was proceeding southeast, and would eventually turn to port toward the waters between the Outer Breakwater and the Miho Breakwater (hereinafter referred to as "the Breakwater Entrance") and depart from the port by using the

Passage*⁵.

Pilot A sighted Vessel B which was continuing to sail toward the Miho Breakwater, and wondered if it might collide with the breakwater. However, Pilot A believed that Vessel B would slow down in order to avoid collision with the breakwater, and that after adjusting her position, she would sail out through the Passage. As the Passage was about 300 m wide, Pilot A considered that Vessel A would be able to pass Vessel B port-side to port-side within the Passage even if they were to pass each other in the Passage, and while also taking into account being affected by a north-northeasterly wind, continued to navigate toward the Breakwater Entrance.

Master A sighted Vessel B which was continuing to sail toward the Miho Breakwater, but believed that Vessel B would eventually sail out through the Passage, and continued to navigate toward the Breakwater Entrance.

Pilot A thought that Master B was likely in a state of panic.

Pilot A sighted Vessel B which was continuing to sail in a course that crossed the Passage from her port bow, and gave orders to go full astern and to set the bow thruster full to starboard so as to thrust the bow to starboard, but Vessel A had headway, and her bow collided with Vessel B's starboard bow at around 18:06.

As no serious damage was found on Vessel A, Vessel A continued her navigation under the pilotage of Pilot A, and berthed at the Sodeshi No. 1 Wharf at around 18:45.

(2) Vessel B

Vessel B completed cargo handling at around 17:12, October 24, and began unberthing operations with the assistance of Vessel C. When Vessel B communicated with the Shimizu Shipping Information Center by radiotelephone at around 17:45 and notified the Center that she had singled up, she received the information that two inbound vessels were waiting outside the breakwater.

Vessel B was unberthed from the Sodeshi No. 1 Wharf at around 17:48 toward the Busan Port, the Republic of Korea, operating a radar in head-up display on a 0.75 M range, with Master B conning the vessel, and Officer B, Engineer B, and Ordinary Seaman B assigned respectively to the radar monitoring/lookout, the main engine remote control system, and the steering system.

After Vessel B left the wharf and was proceeding southeast, Master B recognized that Vessel C, which had assisted the unberthing operations, was sailing toward the east.

Master B considered that, as Vessel C was sailing close to Vessel B's starboard bow, if Vessel B turned to port toward the Breakwater Entrance, Vessel B's starboard stern would collide with Vessel C. Therefore, Master B decided to delay the timing of turning to port, and continued to con the vessel while focusing attention on Vessel C's movements.

^{*5} "By using the passage" means to navigate within the zone specified as the passage, along the direction of the passage. It includes entering or exiting from the passage through the passage entrance or exit and navigating within and along the passage at parts other than the entrance and the exit by the vessel's ordinary mode of navigation, but does not include diagonally navigating or crossing the passage.

Source: *Kōsokuhō No Kaisetsu* (Commentary on the Act on Port Regulations), 16th ed., supervised by the Japan Coast Guard, Kaibundo (published on October 30, 2020).

Vessel B consequently deviated from the Passage to the south and approached the Miho Breakwater. Thus, Master B put the helm hard to port in order to avoid collision with the breakwater, and took a sharp turn toward the north.

Master B believed that Vessel A was waiting outside the Breakwater Entrance due to the information from the Shimizu Shipping Information Center, and had focused attention on Vessel C's movements and on avoiding collision with the Miho Breakwater. Accordingly, Master B did not notice that Vessel A was continuing to sail into the port, until Vessel B avoided collision with the Miho Breakwater.

Master B gave orders to put the helm hard to port and the main engine astern, but Vessel B's starboard bow collided with Vessel A's bow at around 18:06.

Although Vessel B's starboard bow was damaged, there was no oil leakage or injured persons, so Vessel B navigated unaided and berthed at the Sodeshi No. 1 Wharf at around 20:16.

(3) Vessel C

After assisting with Vessel B's unberthing operations, Vessel C proceeded southeast toward the sea area to the west of the Miho Breakwater at a speed of about 8 to 9 kn in order to wait in that sea area until Vessel A's entry into the port, in preparation for assisting with Vessel A's berthing operations.

Vessel C sometimes guides the navigation of the unberthed vessel after completing the unberthing operations, but her task for Vessel B was the unberthing operations only.

Master C recognized Vessel B approaching from behind, and felt that the vessel was coming quite far to the south. However, Master C believed that Vessel B would turn according to the Passage, and continued to navigate.

The date and time of the accident was around 18:06, October 24, 2019, and the location of the accident was around 007° true, 370 m from the Shimizu Port Miho Breakwater North Lighthouse.

(See Attached Figure 1 Navigation Routes and Attached Figure 2 Navigation Routes of Vessel B and Vessel C Estimated Based on Radar Images)

2.2 Injuries to Persons

According to the statements of Master A and Master B, there were no casualties or injuries to persons on Vessel A and Vessel B.

2.3 Damage to Vessels

(1) Vessel A sustained a breach on her bow plating and a dent on her bulbous bow.

(2) Vessel B sustained a dent on her starboard bow plating.

(See Photo 1 and Photo 2)



Photo 1 Status of Damage to Vessel A



Photo 2 Status of Damage to Vessel B

2.4 Crew Information

2.4.1 Age and Certificate of Competence

Master A: 47 years old, national of the People's Republic of China

Certificate of Master (issued by the People's Republic of China)

Date of issue: February 26, 2016

(Valid until February 26, 2021)

Pilot A: 71 years old

Shimizu Pilot District First Grade Pilot's License

Date of issue: December 16, 2004

Date of revalidation: November 20, 2017

Date of expiry: December 15, 2020

Master B: 62 years old, national of the Republic of the Philippines

Endorsement attesting the recognition of certificate under STCW regulation I/10:

Master (issued by Commonwealth of The Bahamas)

Date of issue: May 9, 2018

(Valid until May 5, 2020)

2.4.2 Sea-going Experience, etc.

According to the statements of Master A, Master B, and Pilot A, their experience was as follows.

(1) Master A

Master A began to serve as a master in 2007, and has served on Vessel A as master from June 2018 to April 2019 and since October 9, 2019. Master A requested a pilot as the master was entering the Shimizu Port for the first time.

At the time of the accident, Master A's health condition was good.

(2) Pilot A

Pilot A worked for a shipping company for about 34 years, and served on vessels including container ships and pure car carriers as a master. After that, in 2005, Pilot A began to work as a pilot in the Shimizu Pilot District, and has engaged in pilotage operations more than 5,000 times.

At the time of the accident, Pilot A's health condition was good.

(3) Master B

Master B began to serve as a master in 2001, and has served on Vessel B as master since March 2019. Master B had the experience of entering and departing from the Shimizu Port 10 times, and the experience of departing from the port at nighttime 6 times.

At the time of the accident, Master B's health condition was good.

2.4.3 Fatigue

According to Vessel B's record of rest hours, Master B took seven hours of rest from 08:00 to 15:00 on October 24.

2.5 Vessel Information

2.5.1 Particulars of Vessels

(1) Vessel A

IMO number:	9266114
Port of registry:	Hong Kong Special Administrative Region of the People's Republic of China
Owner:	SITC BANGKOK SHIPPING COMPANY LIMITED (Hong Kong Special Administrative Region of the People's Republic of China)
Management company:	SITC Shipping Management (Shanghai) Co., Ltd. (People's Republic of China)
Class:	CHINA CLASSIFICATION SOCIETY (People's

	Republic of China)
Gross tonnage:	17,153 tons
L×B×D:	171.99 m × 27.60 m × 14.00 m
Vessel type:	Container ship
Hull material:	Steel
Engine:	Diesel engine × 1
Output:	15,785 kW
Propulsion:	5-blade fixed pitch propeller × 1
Built year:	2003
TEU*6:	1,620 TEU
(See Photo 3)	



Photo 3 Vessel A

(2) Vessel B

IMO number:	9251169
Port of registry:	Nassau (Commonwealth of The Bahamas)
Owner:	Legenda Maritime S.A. (Republic of Panama)
Management company:	Kotoku Kaiun, Co., Ltd.
Class:	Nippon Kaiji Kyokai (ClassNK)
Gross tonnage:	9,443 tons
L×B×D:	139.72 m × 23.00 m × 11.00 m
Vessel type:	Container ship
Hull material:	Steel
Engine:	Diesel engine × 1
Output:	8,670 kW

*6 “TEU: Twenty foot Equivalent Unit” means the container quantity based on the unit of a twenty-foot long container.

Propulsion: Fixed pitch propeller × 1
 Date of launch: January 16, 2002
 TEU: 920 TEU
 (See Photo 4)



Photo 4 Vessel B

2.5.2 Status of Draught

(1) Vessel A

According to Vessel A's logbook, Vessel A's draught at departure from the Nagoya Port was about 4.50 m at the bow and about 7.40 m at the stern.

(2) Vessel B

According to the reply to the questionnaire by Master B, Vessel B's draught at departure from the Shimizu Port was about 5.90 m at the bow and about 6.86 m at the stern.

2.5.3 Information on Maneuverability

(1) Vessel A

According to Vessel A's maneuverability characteristics table, her maneuverability was as follows.

1) Main engine revolutions and speed

Speed category	Main engine revolutions per minute (rpm)	Speed with load (kn)
Navigation full ahead	101	19.7
Harbor full ahead	60	12.7
Half ahead	50	10.6
Slow ahead	37	7.5
Dead slow ahead	30	6.0

2) Time and distance needed until stopping at speed full astern

State when astern	Time	Distance (m)
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order issued		
Navigation full ahead	7'55"	2,340
Harbor full ahead	4'20"	1,040
Half ahead	3'55"	640
Slow ahead	2'00"	185

3) Turning characteristics

Speed category		Time	Advance* ⁷ (m)	Transfer* ⁸ (m)
Navigation full ahead	Port turn	1'10"	495	230
	Starboard turn	1'15"	530	270
Harbor full ahead	Port turn	1'40"	445	215
	Starboard turn	1'50"	485	250
Half ahead	Port turn	1'55"	435	200
	Starboard turn	2'05"	465	230

(2) Vessel B

According to Vessel B's maneuverability characteristics table, her maneuverability was as follows.

1) Main engine revolutions and speed

Speed category	Main engine revolutions per minute (rpm)	Speed (kn)
Navigation full ahead	122.6	18.0
Harbor full ahead	95	14.5
Half ahead	85	13.0
Slow ahead	55	9.6
Dead slow ahead	45	6.0

2) Time and distance needed until stopping at speed full astern

State when astern order issued	Time	Distance (m)
Navigation full ahead	4'15"	1,150
Harbor full ahead	2'40"	380
Half ahead	2'20"	360
Slow ahead	2'10"	320

3) Turning characteristics

Speed category		Time	Advance (m)	Transfer (m)
Navigation full ahead	Port turn	4'50"	528	250
	Starboard turn	4'30"	583	316
Harbor full ahead	Port turn	5'10"	550	550
	Starboard turn	5'50"	368	612
Half ahead	Port turn	4'00"	385	458
	Starboard turn	4'30"	385	514

*⁷ "Advance" means the distance advanced by a vessel's center of gravity in the direction of the present course when the vessel turns by 90° from the position of its center of gravity during steering.

*⁸ "Transfer" means the distance of lateral movement by a vessel's center of gravity from the present course when the vessel turns by 90° from the position of its center of gravity during steering.

2.5.4 Other Relevant Vessel Information

According to the statements of Master A and Master B, there was no malfunction or failure of the hull, engine, or equipment of either Vessel A or Vessel B at the time of this accident.

2.6 Weather and Sea Conditions

2.6.1 Weather and Sea Observations

(1) Weather observations

Observations at the Shimizu Automated Meteorological Data Acquisition System located about 2.9 km north of the accident site were as follows.

Time	Average		Maximum instantaneous	
	Wind direction	Wind speed (m/s)	Wind direction	Wind speed (m/s)
17:40	NNE	3.8	N	7.8
17:50	NNE	3.4	NNE	6.1
18:00	NNE	3.6	N	6.6
18:10	N	2.9	N	5.1

(2) Wave observations

Observations at the NOWPHAS*⁹ observation point “Shimizu” located about 1.1 km southeast of the accident site at the time of this accident were as follows.

18:00 Wave height 0.53 m, Wave period 5.0 seconds, Wave direction Southeast

18:20 Wave height 0.51 m, Wave period 5.0 seconds, Wave direction South-southeast

(3) Tide

According to tide tables published by the Japan Coast Guard, the tide in the Shimizu Port at the time of this accident was in the middle of a falling tide.

(4) Time of sunset

According to the astronomical calendar issued by the Japan Coast Guard, the time of sunset at the Shimizu Port on October 24, 2019 was 17:02.

2.6.2 Observations by Crew Members

According to the statements of Master A and Pilot A, the weather at the time of the accident was cloudy with a north-northeasterly wind blowing at a speed of 6 to 8 m/s, and the visibility was good.

2.7 Characteristics of the Area

2.7.1 Act on Port Regulations

Articles 12, 14, and 15 of the Act on Port Regulations (Act No. 174 of 1948) provide as follows with regard to navigation in a port.

Article 12 *If a vessel other than a steam launch, etc. enters or leaves a specified port*

*⁹ “NOWPHAS” (Nationwide Ocean Wave information network for Ports and Harbors - Ports and Harbors Bureau, MLIT) is a wave information network for Japan’s coastlines that was built and is operated through a collaborative effort by the following: the Ports and Harbors Bureau, Ministry of Land, Infrastructure, Transport and Tourism (MLIT); Regional Development Bureaus; Hokkaido Bureau; Okinawa General Office; National Institute for Land, Infrastructure and Management (NILIM); and Port and Airport Research Institute (PARI).

or passes through a specified port, it must use the passage specified by Order of the Ministry of Land, Infrastructure, Transport and Tourism (simply referred to as a “passage” in the following Article through Article 39 and in Article 41).

Article 14 (1) *A vessel entering a passage from outside or seeking to leave a passage must give way to other vessels navigating the passage.*

Article 14 (3) *When vessels pass each other in a passage, they must keep to the starboard side.*

Article 15 *If there is a risk of a steamship meeting with another steamship at the entrance to a port’s breakwater or in its vicinity, the entering steamship must give way to the departing steamship outside the breakwater.*

2.7.2 Information on the Pilot District

According to the Pilotage Act and the Order for Enforcement of the Pilotage Act, the Shimizu Port is a pilot district in which boarding of a pilot is optional.

2.7.3 Information on Waterways

According to *Sailing Directions for South & East Coasts of Honshu* published by the Japan Coast Guard, the area of the accident is as follows.

The Shimizu Port is a specified port as referred to in Article 3, paragraph (2) of the Act on Port Regulations, located on the west side of northern Suruga Bay. A statutory passage about 2.7 M long, about 200 to 300 m wide, and 12 to 25 m deep is established from the port entrance to the entrance to District No. 1, and in the vicinity of the port entrance, the Outer Breakwater and the Miho Breakwater are installed on both sides of this passage.

2.7.4 Navigational Aid Facility

According to a notice to mariners and the statement of the person in charge at the Ports and Harbors Bureau, Shizuoka Prefecture, the Shimizu Port Outer Breakwater South Lighthouse, the Shimizu Port Miho Breakwater North Lighthouse, and the marine light at the southern end of the Miho Breakwater were lighted at the time of this accident.

2.7.5 Shimizu Shipping Information Center

According to the statements of the person in charge at the Shimizu Shipping Information Center and Pilot A, as well as the reply to the questionnaire by the person in charge at the Ports and Harbors Bureau, Shizuoka Prefecture, the circumstances of the Shimizu Shipping Information Center were as follows.

(1) The Shimizu Shipping Information Center is the port radio station of the Shimizu Port, and it was entrusted by the Shimizu Port Authority, Shizuoka Prefecture, which is the port management body, to collect information on vessels planned to enter or depart the Shimizu Port and to engage in communication operations of the Shimizu Port coastal station.

(2) The Shimizu Shipping Information Center decided the order of entry and departure by making adjustments with agents and pilots, based on the Guidelines for Traffic Organization of Shimizu Port, and informed the persons concerned of the departure

- time and the pilot boarding time of major departing vessels.
- (3) When the navigation schedule of a vessel entering or departing from the Shimizu Port was expected to be delayed or was moved forward by about 15 minutes or more, the Shimizu Shipping Information Center changed the order of entry and departure according to the situation at the time.
 - (4) At the time of the accident, the person in charge at the Shimizu Shipping Information Center was carefully watching the movements of Vessel A and Vessel B, believing that Vessel A would enter the port after waiting for Vessel B's departure in waters outside the Breakwater Entrance, and that Vessel B was intentionally making a big turn.
 - (5) The person in charge at the Shimizu Shipping Information Center had previously seen vessels with pilots aboard passing each other in the vicinity of the Breakwater Entrance.
 - (6) Pilot A previously had the experience in which entering and departing vessels with pilots aboard passed each other in the Passage.
 - (7) The Shimizu Shipping Information Center usually did not directly contact the pilot in control of the vessel, as this would interfere with maneuvering,

2.7.6 The Guidelines for Traffic Organization of Shimizu Port

- (1) According to the statement of and the reply to the questionnaire by the person in charge at the Shimizu Shipping Information Center, as well as the Guidelines for Traffic Organization of Shimizu Port, the outline of the guidelines was as follows.

In February 2018, the Shimizu Port Authority Committee (for Cargo Ships and Cruise Vessels) created the Guidelines for Traffic Organization of Shimizu Port, which provide for port rules necessary for conducting traffic organization of vessels by using the Shimizu Shipping Information Center, in order to enhance the navigational safety and efficiency in the Shimizu Port.

The Guidelines for Traffic Organization of Shimizu Port stipulate the following as basic rules (excerpt).

- 1) *Port Rules in the Guidelines do NOT have priority over maritime laws, including the Port and Harbor Act, the Act on Port Regulations, and the Act on Preventing Collision at Sea.*
- 2) *The operation of traffic organization is handled by the Shimizu Shipping Information Center based on relevant regulations and port rules as shown in the Guidelines.*
- 3) *Vessels using the Shimizu Port are to maintain close communication with the Shimizu Shipping Information Center regarding their entering, departing, or shifting.*
- 4) *If vessels compete with other vessels because of schedule changes, the vessels with the changes are to yield.*

If there is a conflict with another vessel due to a change in the operation schedule, the vessel that changed the operation schedule make adjustments.

In addition, the Guidelines stipulated as follows as port rules in the case where

large vessels (gross tonnage of 10,000 tons or more) and vessels with dangerous goods (LNG tankers, product tankers, and other kinds) compete with each other or when they compete with any other vessels.

In principle, all vessels are to cooperate to avoid meeting in the passage; provided, however, that this does not apply if safety is sufficiently secured by agreement between the vessels.

(2) According to the statements of Master A, Pilot A, and Master B, Pilot A knew the Guidelines for Traffic Organization of Shimizu Port, but Master A and Master B did not.

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Course of the Events

According to 2.1 above, the JTSB concludes that the situation was most likely as follows.

(1) Vessel A

- 1) Vessel A navigated the sea area to the east of the Passage at around 18:02 on a course over the ground of about 279° at a speed of about 6.0 kn.
- 2) Vessel A entered the Passage at around 18:03 and navigated on a course over the ground of about 278° at a speed of about 5.9 kn.
- 3) Vessel A navigated the sea area about 420 m to the northeast of the Shimizu Port Miho Breakwater North Lighthouse at around 18:05 on a course over the ground of about 282° at a speed of about 5.6 kn.
- 4) Vessel A put the main engine to full astern at around 18:05:23, and set the bow thruster full to starboard at around 18:05:49, but collided with Vessel B on a course over the ground of about 263° at a speed of about 4.3 kn.

(2) Vessel B

- 1) Vessel B unberthed from the Shimizu Port Sodeshi No. 1 Wharf at around 17:48.
- 2) Vessel B navigated the sea area about 520 m to the west of the Shimizu Outer Breakwater South Lighthouse at around 18:00 on a course over the ground of about 144° at a speed of about 8.3 kn.
- 3) Vessel B entered the Passage from its northern boundary at around 18:01 on a course over the ground of about 138° at a speed of about 8.5 kn.
- 4) Vessel B put the helm hard to port and started to turn to port at around 18:01:36, then put the helm midship at around 18:02:12, and put it hard to port again at around 18:02:21.
- 5) Vessel B navigated the sea area to the south of the Passage at around 18:04 on a course over the ground of about 079° at a speed of about 6.2 kn.
- 6) Vessel B, after navigating the sea area close to the west of the Miho Breakwater, entered the Passage again, then stopped the main engine at around 18:05:22, and put the helm hard to port and the main engine astern at around 18:05:51, but collided with Vessel A on a course over the ground of about 017° at a speed of about 7.3 kn.

3.1.2 Date, Time, and Location of the Accident Occurrence

According to 2.1.1 and 2.1.2 above, the JTTSB concludes that the date and time of the accident was most likely around 18:06, October 24, 2019, and the location of the accident around 007° true, 370 m from the Shimizu Port Miho Breakwater North Lighthouse.

3.1.3 Damage to Vessels

According to 2.3 above, the JTTSB concludes that the situation was as follows.

- (1) Vessel A sustained a breach on her bow plating and a dent on her bulbous bow.
- (2) Vessel B sustained a dent on her starboard bow plating.

3.1.4 Situation of the Collision

According to 2.1.1, 3.1.2, and 3.1.3 above, the JTTSB concludes that Vessel A's bow and Vessel B's starboard bow most likely collided with each other. Meanwhile, Vessel A's heading at the time of collision was most likely about 280° and the speed about 4.3 kn, whereas Vessel B's heading was most likely about 006° and the speed about 7.3 kn.

3.2 Causal Factors of the Accident

3.2.1 Situation of Crew Members

According to 2.4 above, the JTTSB concludes that the situation was as follows.

(1) Master A

Master A possessed a legally valid certificate of competence. In addition, at the time of the accident, it is probable that Master A's health condition was good.

(2) Pilot A

Pilot A possessed a legally valid pilot's license. In addition, at the time of the accident, it is probable that Pilot A's health condition was good.

(3) Master B

Master B possessed a legally valid endorsement attesting the recognition of certificate under STCW regulation I/10. In addition, at the time of the accident, it is probable that Master B's health condition was good.

3.2.2 Situation of the Vessels

According to 2.5.4 above, the JTTSB concludes that there was more likely no malfunction or failure of the hull, engine, or equipment of either Vessel A or Vessel B at the time of this accident.

3.2.3 Weather and Sea Conditions

According to 2.6 above, the JTTSB concludes that the weather at the time of the accident was more likely cloudy with a north-northeasterly wind blowing at a speed of about 6 to 8 m/s, a wave height of about 0.52 m, and good visibility.

3.2.4 Analysis of Navigation

According to 2.1.1, 2.7.1, 2.7.2, and 2.7.6 above, the JTSB concludes that the situation was more likely as follows.

(1) Vessel A

If there was a risk of meeting with another vessel in the vicinity of the entrance to the breakwater, Vessel A was to give way to the other departing vessel outside the breakwater and, according to port rules under the Guidelines for Traffic Organization of Shimizu Port, Vessel A was to avoid meeting another vessel in the passage. However, she navigated the Passage keeping headway until she collided with Vessel B.

(2) Vessel B

Vessel B was required to use the Passage, but she deviated from the Passage to the south, and passed the Breakwater Entrance by diagonally crossing the Passage from outside.

3.2.5 Analysis of the Situation of Sighting the Other Vessel

(1) Vessel A

According to 2.1.4 above, the JTSB concludes that Master A and Pilot A were more likely sighting Vessel B departing from the port.

(2) Vessel B

According to 2.1.4 above, Master B more likely believed that Vessel A was waiting outside the Breakwater Entrance due to the information from the Shimizu Shipping Information Center, and had focused attention on Vessel C's movements and on avoiding collision with the Miho Breakwater. Accordingly, Master B more likely did not notice that Vessel A was continuing to sail into the port, until Vessel B avoided collision with the Miho Breakwater.

3.2.6 Analysis of Maneuvering of Vessel A to Enter the Port

According to 2.1.1, 2.1.4, and 2.7.5 above, the JTSB concludes that the maneuvering was as follows.

(1) It is probable that, as Pilot A believed that Vessel A would pass Vessel B outside the port if its speed was controlled, and did not want to consume time waiting for Vessel B's departure at the boarding point, Pilot A had Vessel A continue to enter the port at a speed slower than the normal entry speed by using the main engine as slow ahead.

(2) It is probable that Master A sighted Vessel B which was continuing to sail toward the Miho Breakwater, but believed that Vessel B would eventually sail out through the Passage, and continued to navigate toward the Breakwater Entrance.

(3) It is probable that Pilot A sighted Vessel B which was continuing to sail toward the Miho Breakwater, and wondered if it might collide with the breakwater. However, It is probable that Pilot A believed that Vessel B would slow down in order to avoid collision with the breakwater, and that after adjusting her position, she would sail out through the Passage. As the Passage was about 300 m wide, It is probable that Pilot A considered that Vessel A would be able to pass Vessel B port-side to port-side

within the Passage even if they were to pass each other in the Passage, continued to navigate toward the Breakwater Entrance.

- (4) The fact that Pilot A previously had the experience of passing another vessel in the Passage and the fact that Vessel B's unberthing was delayed from schedule were likely involved in Pilot A's believing that Vessel A would be able to pass Vessel B port-side to port-side within the Passage and continuing to navigate.

3.2.7 Analysis of Maneuvering of Vessel B to Depart from the Port

- (1) According to 2.1.4 above, the JTSB concludes that Master B more likely considered that, as Vessel C was sailing close to Vessel B's starboard bow, if Vessel B turned to port toward the Breakwater Entrance, Vessel B would approach Vessel C in a manner that her starboard stern would collide with Vessel C. Therefore, it is probable that Master B decided to delay the timing of turning to port, and continued to con the vessel while focusing attention on Vessel C's movements.
- (2) According to 2.1.1 and 2.1.4 above, it is probable that Vessel B consequently deviated from the Passage to the south and approached the Miho Breakwater, and therefore Master B put the helm hard to port in order to avoid collision with the breakwater, and took a sharp turn toward the north.

3.2.8 Analysis of Communication

- (1) According to 2.1.2, 2.1.4, and 3.2.5 above, the JTSB concludes that Master B more likely considered that, Master B did not confirm the maneuvering intention with Vessel A, as Master B had focused attention on Vessel C's movements and did not notice that Vessel A was continuing to sail into the port.
- (2) According to 2.1.4 above, it is probable that Master C had no intention to guide the navigation of Vessel B, and was navigating toward the sea area to the west of the Miho Breakwater in order to wait for the timing to assist the berthing operations of Vessel A, which was soon to enter the port. It is also probable that Master B did not communicate with Vessel C concerning the maneuvering intention because, although Master B considered that there was a risk of approaching Vessel C in the vicinity of the Breakwater Entrance, the master considered that a safe distance could be secured with Vessel C by delaying the timing of turning to port.
- (3) According to 2.1.3 and 2.7.5 above, it is probable that, at the time of the accident, the person in charge at the Shimizu Shipping Information Center was carefully watching the movements of Vessel A and Vessel B without confirming the maneuvering intention with Vessel A, believing that Vessel A would enter the port after waiting for Vessel B's departure in waters outside the Breakwater Entrance.

3.2.9 Analysis of Navigational Adjustments by the Shimizu Shipping Information Center

- (1) According to 2.1.3 above, the JTSB concludes that the Shimizu Shipping Information Center was more likely making navigational adjustments to have Vessel D and Vessel A enter the port after Vessel B's departure.
- (2) According to 2.1.1 and 2.1.3 above, at the time of the accident, it is probable that it

was appropriate for Vessel A to enter after Vessel B departed, because Vessel A was scheduled to berth at the same Sodeshi Wharf No. 1 as Vessel B.

- (3) According to 2.1.3 and 2.7.5 above, the fact that reconfirmation on the order of entry and departure was not made when Vessel A started to enter the port by using the Passage were likely involved in the occurrence of the accident.

The fact that the Shimizu Shipping Information Center did not reconfirm the order of entry and departure when the vessel A started to enter the port by using the Passage may have been likely related to the fact that the Center usually did not directly contact the pilot in control of the vessel, as this would interfere with ship operations.

3.2.10 Analysis of the Accident Occurrence

According to 2.1, 3.2.6, and 3.2.7 above, the JTTSB concludes that the situation was as follows.

(1) Vessel A

- 1) It is probable that Master A sighted Vessel B which was continuing to sail toward the Miho Breakwater, but believed that Vessel B would eventually sail out through the Passage, and continued to navigate toward the Breakwater Entrance.
- 2) It is probable that Pilot A sighted Vessel B which was continuing to sail toward the Miho Breakwater, and wondered if it might collide with the breakwater. However, it is probable that Pilot A believed that Vessel B would slow down in order to avoid collision with the breakwater, and that after adjusting her position, she would sail out through the Passage. As the Passage was about 300 m wide, it is probable that Pilot A considered that Vessel A would be able to pass Vessel B port-side to port-side within the Passage even if they were to pass each other in the Passage, continued to navigate toward the Breakwater Entrance.

(2) Vessel B

- 1) It is probable that Master B considered that, as Vessel C was sailing close to Vessel B's starboard bow, if Vessel B turned to port toward the Breakwater Entrance, Vessel B would approach Vessel C in a manner that her starboard stern would collide with Vessel C. Therefore, it is probable that Master B decided to delay the timing of turning to port, and continued to con the vessel while focusing attention on Vessel C's movements.
- 2) It is probable that Vessel B consequently deviated from the Passage to the south and approached the Miho Breakwater, and therefore Master B put the helm hard to port in order to avoid collision with the breakwater, and took a sharp turn toward the north.

4 Probable Causes

The JTTSB concludes that the probable cause of this accident was that, it is probable that,

during the nighttime in the Shimizu Port, while Vessel A was entering the port toward the Sodeshi No. 1 Wharf and Vessel B left the wharf and was departing toward outside of the port, Master A and Pilot A continued to enter the port, believing that Vessel A would be able to pass Vessel B port-side to port-side within the Passage, whereas Master B made Vessel B turn to port toward the Breakwater Entrance at a delayed timing, causing Vessel B to deviate from the Passage to the south and approach the Miho Breakwater, and then Master B put the helm hard to port in order to avoid collision with the breakwater, taking a sharp turn toward the north, after which Vessel B sailed out of the port by crossing the Passage to the north-northeast, and consequently Vessel A and Vessel B collided with each other.

It is probable that Master A and Pilot A continued to enter the port, believing that Vessel A would be able to pass Vessel B port-side to port-side within the Passage, because they believed that Vessel B would sail out by using the Passage, and would not sail out by crossing the Passage to the north-northeast.

It is probable that Master B made Vessel B turn to port toward the Breakwater Entrance at a delayed timing, due to believing that if Vessel B turned to port toward the Breakwater Entrance, Vessel B would approach Vessel C in a manner that her starboard stern would collide with Vessel C, and the master continued to con the vessel while focusing attention on Vessel C's movements.

The fact that reconfirmation on the order of entry and departure was not made when Vessel A started to enter the port by using the Passage were likely involved in the occurrence of the accident.

5 SAFETY ACTIONS

The JTSB concludes that the probable cause of this accident was that, it is probable that, during the nighttime in the Shimizu Port, while Vessel A was entering the port toward the Shimizu Port Sodeshi No. 1 Wharf and Vessel B left the wharf and was departing toward outside of the port, Master A and Pilot A continued to enter the port by using the Passage in spite of recognizing Vessel B departing from the port, whereas Master B made Vessel B turn to port toward the Breakwater Entrance at a delayed timing, causing Vessel B to deviate from the Passage to the south, after which Vessel B sailed out of the port by diagonally crossing the Passage, and consequently Vessel A and Vessel B collided with each other.

It is probable that Vessel A is to have been able to avoid collision with Vessel B by waiting for Vessel B's departure in waters outside the Passage. It is probable that Vessel B is to have been able to depart by using the Passage instead of crossing the Passage to north-northeast if Master B had conned the vessel without focusing attention solely on Vessel C's movements.

Therefore, in order to prevent the recurrence of similar accidents in the future, the following measures are considered.

- (1) When there is a risk of passing a departing vessel in the vicinity of the Breakwater Entrance, an entering vessel is to wait in waters outside the Passage according to the port rules prescribed in the Guidelines for Traffic Organization of Shimizu Port.

- (2) A departing vessel is to sail out by using the passage while continuously confirming the ship's position without conning the vessel by focusing attention solely on movements of a specific vessel.
- (3) When a delay in departure, etc. occurs, the entering and departing vessels and the Shimizu Shipping Information Center are to recognize the possibility that the entering and departing vessels could approach each other in the vicinity of the Breakwater Entrance, and make reconfirmation on the order of entry and departure.
- (4) The Shimizu Pilotage District Pilots' Association shall provide guidance and education to its member pilots to ensure safe navigation in compliance with the Guidelines for Traffic Organization of Shimizu Port.

5.1 Safety Actions Taken

5.1.1 Actions Taken by the Shimizu Pilot District Pilots' Association

After the accident, the Shimizu Pilot District Pilots' Association to which Pilot A is a member informed all members of the following safety actions and ensured thorough implementation of those actions.

- (1) If risky meeting is expected to occur between entering and departing vessels, etc., advance confirmation on the intention of the other vessel and the expected passing time, etc. is to be made between those vessels or through the Shimizu Shipping Information Center, by using VHF communication.
- (2) If a vessel has a risk of meeting another vessel, particularly one without a pilot aboard, in the vicinity of the port entrance, the vessel is to adjust her course and speed so as to be able to pass the other vessel port-side to port-side while keeping a safe distance outside the port, and enter the port after confirming that the other vessel has passed the breakwater entrance.
- (3) The Shimizu Shipping Information Center is to ensure navigation time adjustment that allows for sufficient time, based on the Guidelines for Traffic Organization of Shimizu Port, and to reinforce its framework for communicating and sharing that information.

In addition, the Shimizu Pilot District Pilots' Association took the following actions against Pilot A.

- (1) After the day following the occurrence of the accident, all pilotage operations were suspended for 10 days for the purpose of dealing with the accident.
- (2) It was decided that a safety training program sponsored by the Japan Federation of Pilots' Associations was to be held at their own expense in order to rebuild their awareness of safe operation.

5.1.2 Actions taken by the Shimizu Shipping Information Center

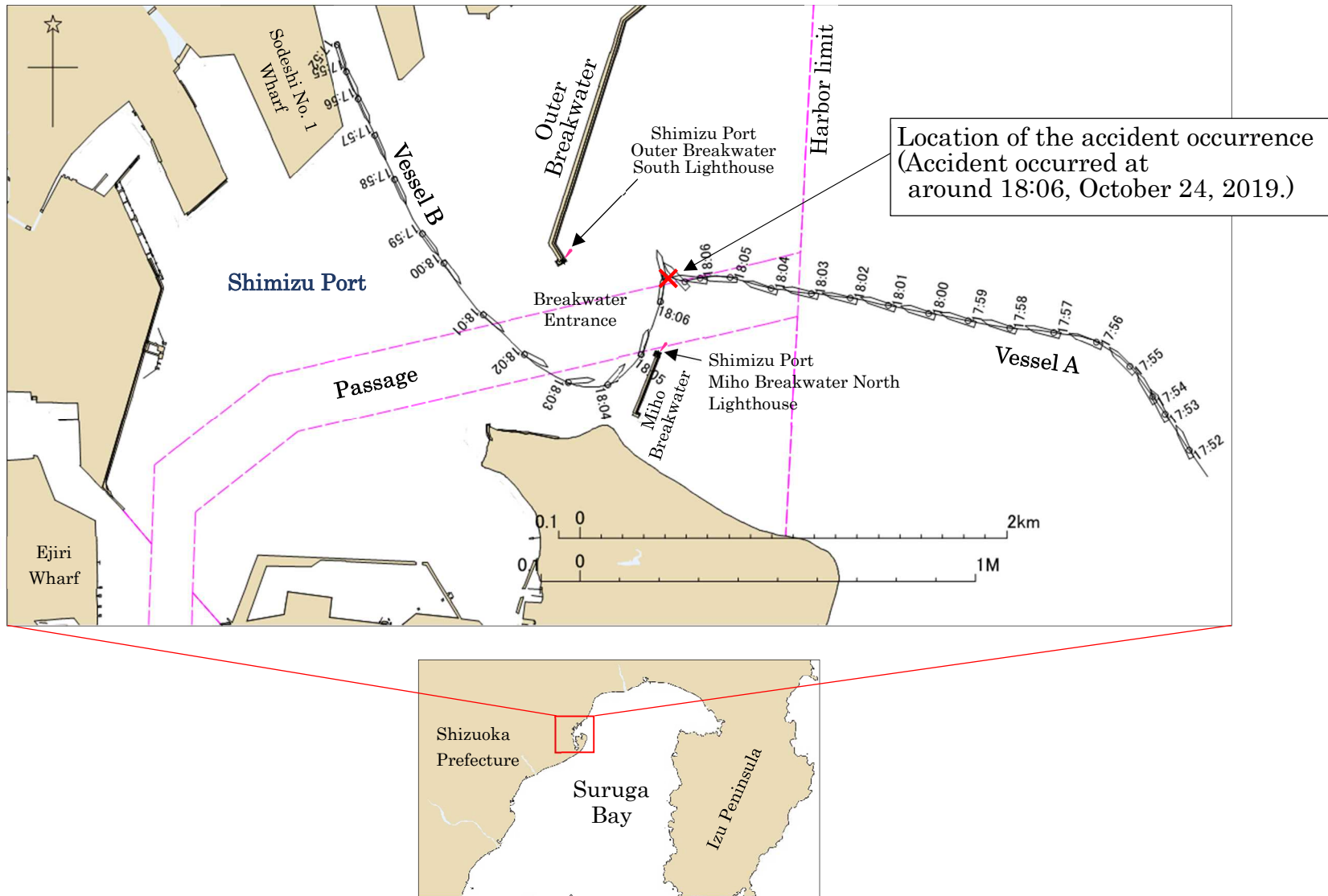
In response to this accident, the Shimizu Shipping Information Center decided to contact the pilot in the control of vessel directly in case of emergency.

5.2 Safety Actions Required

- (1) When there is a risk of passing a departing vessel in the vicinity of the Breakwater

- Entrance, an entering vessel is to wait in waters outside the Passage according to the port rules prescribed in the Guidelines for Traffic Organization of Shimizu Port.
- (2) A departing vessel is to sail out by using the passage while continuously confirming the ship's position without conning the vessel by focusing attention solely on movements of a specific vessel.
 - (3) When a delay in departure, etc. occurs, the entering and departing vessels and the Shimizu Shipping Information Center are to recognize the possibility that the entering and departing vessels could approach each other in the vicinity of the Breakwater Entrance, and make reconfirmation on the order of entry and departure.
 - (4) The Shimizu Pilotage District Pilots' Association shall provide guidance and education to its member pilots to ensure safe navigation in compliance with the Guidelines for Traffic Organization of Shimizu Port.

Attached Figure 1 Navigation Routes



Attached Figure 2 Navigation Routes of Vessel B and Vessel C Estimated Based on Radar Images

