

MA2021-3

**MARINE ACCIDENT
INVESTIGATION REPORT**

March 25, 2021



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.

MARINE ACCIDENT INVESTIGATION REPORT

Vessel type and name: Container ship APL PUSAN
IMO number: 9234123
Gross tonnage: 25,305 tons

Vessel type and name: Cargo ship SHOUTOKUMARU
Vessel Number: 136463
Gross tonnage: 391 tons

Accident type: Collision
Date and time: Around 04:22:32 October 15, 2019
Location: Uraga Suido Traffic Route, off the northeast of Yokosuka Port,
Yokosuka City, Kanagawa Prefecture
Around 317° true bearing, 1.3 nautical mile from the Daini Kaiho Lighthouse
(Approximately 35°19.7'N, 139°43.4'E)

February 3, 2021

Adopted by the Japan Transport Safety Board

Chairperson	Nobuo Takeda
Member	Yuji Sato
Member	Kenkichi Tamura
Member	Yoshiko Kakishima
Member	Makiko Okamoto

SYNOPSIS

< Summary of the Accident >

Container ship APL PUSAN, with a master and 22 other crew members aboard, was proceeding to Section 2 in Keihin Port under the pilotage of a pilot, while cargo ship SHOUTOKUMARU, with a master, an officer, and 2 other crew members aboard, was proceeding for anchorage Y1 at Yokohama Section in Keihin Port. On October 15, 2019, around 04:22, while both vessels were proceeding northwest bound in Uraga Suido Traffic Route, both vessels collided on the Traffic Route, and APL PUSAN collided with a light buoy after that.

APL PUSAN suffered a dent on her port bow, SHOUTOKUMARU's bulwark bow suffered damages, etc. while the light buoy's guard frame suffered a dent, but there were no casualties on either vessel.

< Probable Causes >

It is probable that in this accident, when both APL PUSAN and SHOUTOKUMARU were proceeding northwestward in the vicinity of the north exit of the Uruga Suido Traffic Route at night, the pilot of APL PUSAN, thinking that he could safely overtake SHOUTOKUMARU even if he did not inform SHOUTOKUMARU of his intention to overtake on the starboard side by the International VHF Radio Telephone equipment (VHF), etc., continued to navigate in a manner to overtake SHOUTOKUMARU, and when the officer of SHOUTOKUMARU received information from Japan Coast Guard TOKYO WAN Vessel Traffic Service Center (Tokyo MARTIS) that she was obliged to navigate the Nakanose Traffic Route, he turned to starboard toward the Nakanose Traffic Route without knowing the existence of APL PUSAN on the starboard quarter, so both vessels collided, and then the starboard bow of APL PUSAN collided with the Uruga Suido Traffic Route light buoy No. 8 (the Buoy).

It is probable that the pilot of APL PUSAN thought that he could overtake SHOUTOKUMARU safely without informing SHOUTOKUMARU of his intention to overtake starboard side of SHOUTOKUMARU by VHF or other means because SHOUTOKUMARU, after proceeding toward the center of the Uruga Suido Traffic Route, did not turn to starboard toward Nakanose Traffic Route even after passing through the southwest of Daini Kaiho, and continued proceeding northwestward toward the north exit of the Uruga Suido Traffic Route.

It is probable that the officer of SHOUTOKUMARU turned to starboard toward Nakanose Traffic Route without knowing the existence of APL PUSAN on the starboard quarter because he thought that the speed difference of vessels navigating the Uruga Suido Traffic Route with speed limitation was small and that SHOUTOKUMARU would not be overtaken, and when he received information from the Tokyo MARTIS to the effect that she was obliged to navigate the Nakanose Traffic Route, he thought it necessary to enter the Nakanose Traffic Route immediately because he thought it was an instruction, and thought that he would not be able to enter the Nakanose Traffic Route by turning in front of the Buoy on the starboard bow unless he turned to starboard immediately, and was proceeding paying attention to turning to starboard toward the Nakanose Traffic Route while paying attention to other vessels on her bow.

It is probable that the following factors contributed to the occurrence of the accident: the master of SHOUTOKUMARU entrusted the officer with the bridge watch on Uruga Suido Traffic Route; SHOUTOKUMARU was on bridge watch by the officer while the master and the officer did not properly share information necessary for navigation such as navigation plans; the officer communicated to Tokyo MARTIS the location different from the scheduled anchorage without knowing that the name of the scheduled anchorage was anchorage Y1, and continued the navigation without hearing the information concerning APL PUSAN provided by VHF from Tokyo MARTIS.

1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

Container ship APL PUSAN, with a master and 22 other crew members aboard, was proceeding to Section 2 in Keihin Port under the pilotage of a pilot, while cargo ship SHOUTOKUMARU, with a master, an officer, and 2 other crew members aboard, was proceeding for anchorage Y1 at Yokohama Section in Keihin Port. On October 15, 2019, around 04:22, while both vessels were proceeding northwest bound in Uraga Suido Traffic Route, both vessels collided on the Traffic Route, and APL PUSAN collided with a light buoy after that.

APL PUSAN suffered a dent on her port bow, SHOUTOKUMARU's bulwark bow suffered damages, etc. while the light buoy's guard frame suffered a dent, but there were no casualties on either vessel.

1.2 Outline of the Accident Investigation

1.2.1 Setup of the Investigation

The Japan Transport Safety Board appointed an investigator-in-charge from Yokohama Office and 1 other local accident investigator to investigate this accident on October 28, 2019.

The investigator-in-charge was later replaced by a marine accident investigator.

1.2.2 Collection of Evidence

October 30, November 5, 18, 27, 2019: Collection of questionnaires

November 11, 14, December 4, 12, 2019, February 12, 14 2020: Interviews

November 16, 2019: On-site investigation and interviews

December 24, 2019: On-site investigation

1.2.3 Opinions of Parties Relevant to the Cause

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

2 FACTUAL INFORMATION

2.1 Events Leading to the Accident

2.1.1 The Navigation Track according to the Records of Radar Station

According to the images sent from radar stations in Kannonzaki, Honmoku, Umihotaru, and other places to Japan Coast Guard TOKYO WAN Vessel Traffic Service Center (hereinafter referred to as "Tokyo MARTIS"), the navigational track record of APL PUSAN (hereinafter referred to as "Vessel A") and SHOUTOKUMARU (hereinafter referred to as "Vessel B") from 03:30:04 to 04:22:34 on October 15, 2019, are as shown on Table 1 and Table 2. The images were subjected to synthetic processing (image display processing) by a radar image synthesizer.

The course above the ground is in true bearing (hereinafter the same), and the position of the vessel is measured at the center by the radar imaging, but the actual center might be different depending on the type of vessel and the angle of reflection from the radar. In addition, since there is a delay of about 15 seconds to 25 seconds between the time at the actual position of the ship and the time displayed on the display device after the synthesis processing by the radar image synthesizer, the average value of about 20 seconds was corrected as the delay time.

(See Figure 1)

Table 1 Radar Record of Vessel A (Excerpt)

Time (HH:MM:SS)	Ship's position		Course over the Ground (°)	Speed over the Ground (Knots(kn))
	Latitude (N) (°- '-")	Longitude(E) (°- '-")		
03:30:04	35-09-55.5	139-46-18.7	010.0	6.8
03:36:04	35-10-40.4	139-46-28.8	011.0	9.7
03:46:04	35-12-43.6	139-46-49.7	009.0	12.7
03:52:04	35-14-01.2	139-46-50.4	000.0	13.1
03:58:04	35-15-20.6	139-46-50.2	356.0	12.7
04:00:04	35-15-40.3	139-46-36.0	325.0	12.0
04:05:40	35-16-38.5	139-45-46.6	325.0	12.7
04:10:04	35-17-24.6	139-45-07.4	325.0	13.0
04:11:04	35-17-35.0	139-44-58.3	325.0	12.9
04:12:04	35-17-45.5	139-44-48.8	323.0	12.7
04:13:04	35-17-55.5	139-44-39.4	321.0	12.6
04:14:04	35-18-06.0	139-44-30.4	326.0	12.6
04:15:04	35-18-16.4	139-44-21.9	327.0	12.7
04:16:04	35-18-27.1	139-44-13.7	328.0	12.8
04:17:04	35-18-38.1	139-44-05.5	328.0	12.8
04:18:04	35-18-49.2	139-43-57.7	330.0	12.9
04:19:04	35-19-00.7	139-43-49.8	331.0	13.0
04:20:04	35-19-12.1	139-43-42.2	331.0	13.0
04:21:04	35-19-23.4	139-43-34.7	332.0	12.9
04:21:10	35-19-25.5	139-43-33.3	332.0	13.0
04:21:22	35-19-27.4	139-43-32.0	332.0	13.0
04:21:34	35-19-29.3	139-43-30.8	332.0	13.0
04:21:40	35-19-31.0	139-43-29.6	331.0	13.0
04:21:52	35-19-32.9	139-43-28.4	331.0	12.9
04:22:04	35-19-34.8	139-43-27.1	331.0	12.9
04:22:22	35-19-38.4	139-43-24.9	328.0	12.5
04:22:34	35-19-40.4	139-43-23.9	328.0	12.0

Table 2 Radar Record of Vessel B (Excerpt)

Time (HH:MM:SS)	Ship's position		Course over the Ground (°)	Speed over the Ground (Knots(kn))
	Latitude (N) (°- '-")	Longitude(E) (°- '-")		
03:30:04	35-11-42.8	139-46-39.5	012.5	10.4
03:36:04	35-12-43.4	139-46-51.4	008.5	10.4

03:46:04	35-14-27.3	139-47-00.0	002.6	9.9
03:52:04	35-15-27.0	139-46-51.4	323.3	9.9
03:58:04	35-16-18.2	139-46-10.8	328.9	9.9
04:00:04	35-16-36.1	139-45-56.2	324.3	10.4
04:05:40	35-17-24.0	139-45-15.9	323.7	10.4
04:10:04	35-17-58.9	139-44-40.9	320.7	9.9
04:11:04	35-18-06.7	139-44-33.1	321.0	10.4
04:12:04	35-18-14.6	139-44-24.6	319.8	9.9
04:13:04	35-18-23.2	139-44-17.0	324.3	9.9
04:14:04	35-18-31.1	139-44-09.4	321.3	10.4
04:15:04	35-18-39.4	139-44-01.4	322.8	10.4
04:16:04	35-18-47.6	139-43-54.3	326.0	10.8
04:17:04	35-18-57.1	139-43-47.3	329.0	10.4
04:18:04	35-19-06.7	139-43-40.9	330.6	9.9
04:19:04	35-19-15.1	139-43-34.2	327.6	10.8
04:20:04	35-19-24.1	139-43-27.3	328.3	10.4
04:21:04	35-19-33.9	139-43-19.7	329.3	10.8
04:21:10	35-19-33.5	139-43-19.3	327.7	9.9
04:21:22	35-19-35.7	139-43-18.7	330.1	9.1
04:21:34	35-19-37.1	139-43-18.8	339.5	8.2
04:21:40	35-19-37.4	139-43-18.7	343.5	7.8
04:21:52	35-19-39.1	139-43-17.8	351.0	7.3
04:22:04	35-19-39.7	139-43-19.1	009.7	6.0
04:22:16	35-19-40.9	139-43-19.3	009.7	6.0
04:22:22	35-19-41.4	139-43-19.4	009.7	6.0
04:22:34	35-19-42.6	139-43-19.7	009.7	6.0

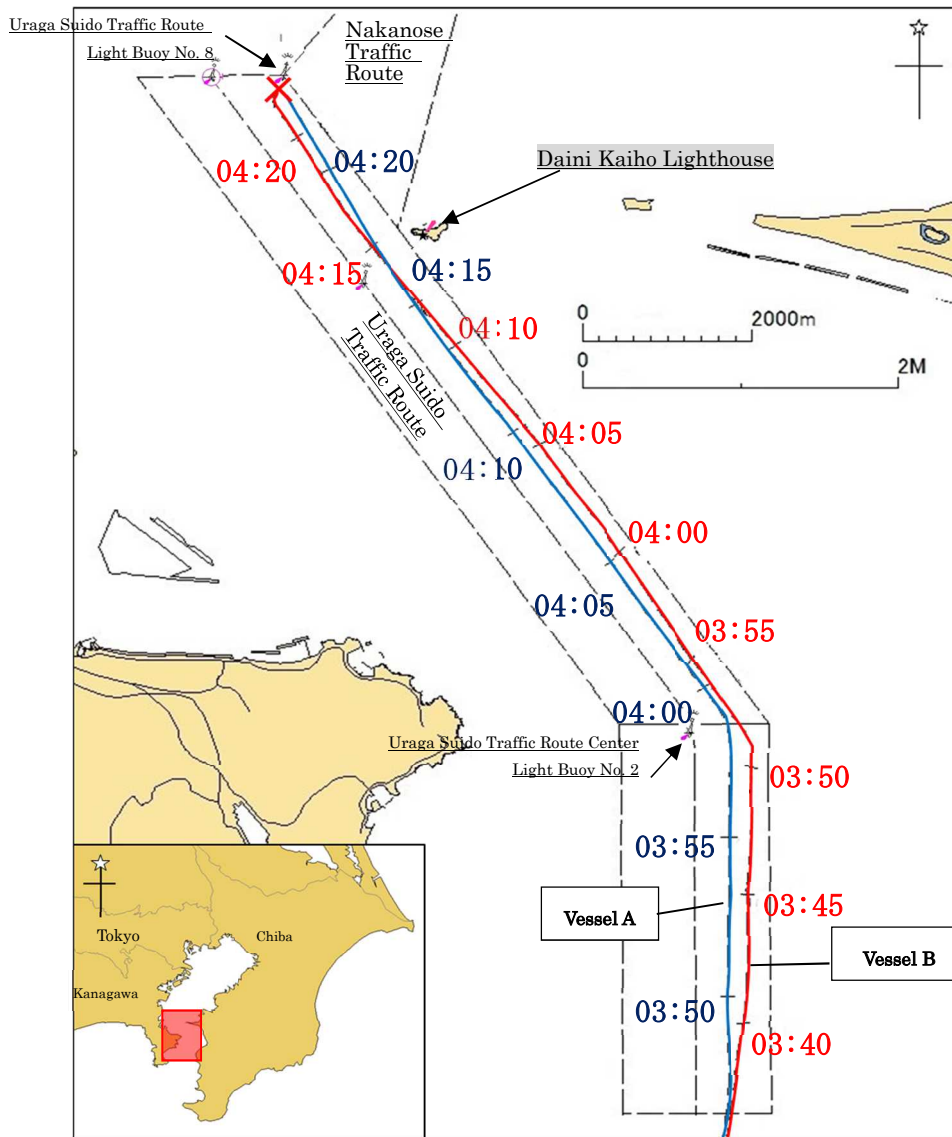


Figure 1 The Navigational Tracks of Vessel A and Vessel B According to the Radar Records

2.1.2 Events Leading to the Accident according to Statements of Crew Members, etc.

According to statements by the master of Vessel A (hereinafter referred to as “Master A”), the officer of Vessel A (hereinafter referred to as “Officer A”), the pilot of Vessel A (hereinafter referred to as Pilot A), the master of Vessel B (hereinafter referred to as “Master B”), two officers of Vessel B (hereinafter referred to as “Officer B₁”, “Officer B₂”), as well as the statements from the Vessel Traffic Service operator of Tokyo MARTIS (hereinafter referred to as “VTS Operator”) and according to the reply to the questionnaire by Tokyo MARTIS, the events leading to the accident were as follows.

(1) Vessel A

Vessel A, with Master A and other 22 crew members on board (People's Republic of China National 4 people, Republic of the Union of Myanmar 18 people) with her navigation lights turned on according to the Maritime Law, under the guidance of Master A, Officer A on the lookout, an able seaman on the hand steering. Under the pilotage of Pilot A, who boarded the vessel at the southern offshore of the south entrance of Uraga Suido Traffic Route, Vessel A proceeded north passing the south entrance of the Traffic Route towards Yokohama Section 2, Keihin Port at

around 03:46 on October 15, 2019.

At around 03:58, Vessel A changed her course approximately 325° (true bearing, hereinafter the same) in the vicinity of the center light buoy No. 2 on the Uruga Suido Traffic Route (hereinafter referred to as "light buoy No.2"), and proceeded northwest on the Traffic Route with a speed of approximately 12.5 kn (speed over the ground, hereinafter the same).

While keeping a lookout visually and on the radar, Pilot A noticed that Vessel B, which was proceeding on the same course at a speed of about 10.5 kn by approaching the right side of the Uruga Suido Traffic Route at about 1 nautical mile (M) on the starboard bow, changed its course from approximately 325 ° to approximately 320 ° toward the center of the traffic route and crossed approximately 0.5 M on the bow of Vessel A from starboard to port, and thought that Vessel B was heading for the north exit of the traffic route.

At around 04:13, Pilot A predicted that Vessel A would overtake Vessel B near the north exit of the Uruga Suido Traffic Route because Vessel A's speed was faster than Vessel B's, and informed Master A that Vessel A would overtake Vessel B on the starboard side.

Master A thought that Vessel A could safely overtake Vessel B on the starboard side because Vessel B was proceeding toward the center of the Uruga Suido Traffic Route and there was no sign of turning to starboard toward the Nakanose Traffic Route, and accepted the proposal from Pilot A.

At around 04:16, Pilot A noticed that Vessel B was proceeding northwest toward Nakanose Traffic Route without turning to starboard even though Vessel B had passed the southwest side of Daini Kaiho, and changed the course from approximately 325 ° to approximately 332 ° toward the starboard side of Vessel B.

(See Figure 2)

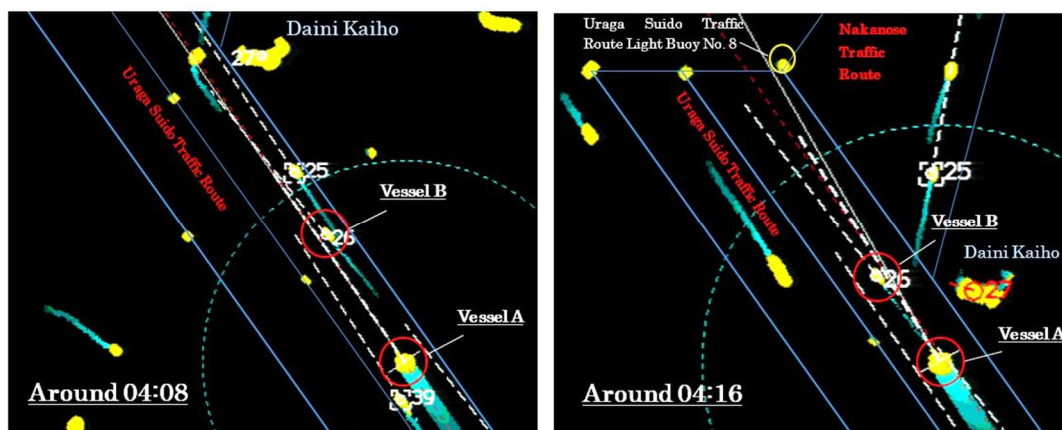


Figure 2 Radar image recorded in the S-VDR of Vessel A

At around 04:19, Pilot A noticed Vessel B had returned its course to 325°, so the overtaking distance was smaller than originally planned, but since Vessel B was proceeding Northwest toward the north exit of the Uruga Suido Traffic Route, not turning to starboard toward Nakanose Traffic Route, thinking Vessel A could safely overtake the starboard side of Vessel B and continued to proceed northwest.

Pilot A continued to navigate, paying attention to Vessel B and the Uruga Suido Traffic Route light buoy No. 8 (hereinafter referred to as "the Buoy") on the starboard bow, to maintain a safe passage distance.

Pilot A heard that Tokyo MARTIS called a vessel (hereinafter referred to as "The Vessel") navigating on Uruga Suido Traffic Route by the International VHF Radio Telephone equipment

(hereinafter referred to as "VHF") and changed the VHF from Channel 16 (CH) to 14 CH. When Pilot A changed the VHF of Vessel A to 14 CH in order to intercept the communication, Pilot A heard a communication at around 04:20 that The Vessel was a vessel obliged to navigate Nakanose Traffic Route.

Pilot A did not know the name of Vessel B, which was about 0.4 M on the port bow of Vessel A, and because another vessel was sailing in the aft direction, he did not have any confirmation that The Vessel was Vessel B. However, even if Vessel B was the Vessel, as Vessel B would soon approach the north exit of the Uraga Suido Traffic Route, he predicted that Vessel B would depart from the north exit of the Traffic Route, and returned VHF to 16 CH to concentrate on maneuvering the vessel.

At around 4:21, Pilot A was called by VHF by Tokyo MARTIS and received information that Vessel B was The Vessel and was destined for the anchorage K1, Kawasaki Section, Keihin Port, and learned that Vessel B was destined for Nakanose Traffic Route.

As Pilot A saw that Vessel B began to turn to starboard, he immediately called Vessel B on VHF, but there was no response. Immediately after Pilot A ordered that the main engine be operated in neutral, Master A ordered hard starboard, and Officer A blew a long blast on the whistle in accordance with Master A's order.

Immediately after Vessel A started decelerating and turning to starboard, the port bow of Vessel A collided with the bow of Vessel B at around 4:22:32, and then the starboard bow of Vessel A collided with the Buoy.

Pilot A notified the Japan Coast Guard and Tokyo Bay Licensed PILOT'S Association about the occurrence of the accident, and after confirming that there was no submersion, Vessel A resumed her navigation toward Yokohama Section 2 of Keihin Port.

(2) Vessel B

Vessel B, with Master B and Officer B₁ and 2 other crew members on board, was scheduled to berth at the company berth in Kawasaki Section, Keihin Port, and left Sakaide Port, Kagawa Prefecture for the anchorage Y1, Yokohama Section, Keihin Port at around 15:00 on the 13th.

Master B informed Officer B₁ that he would anchor temporarily before reaching the company berth in Kawasaki Section, Keihin Port, which was the destination port, that he would go through Uraga Suido Traffic Route, the sea area to the west of Nakanose, and that he would go up the bridge near the sea area to the west of Nakanose. As for the planned anchorage, Master B explained the navigation plan by pointing out the anchorage between the Tsurumi Passage and the Yokohama Passage on the chart.

Vessel B turned on the navigation lights, and after passing the line connecting Tsurugisaki Lighthouse and Sunosaki Lighthouse at about 02:30 on the 15th, Officer B₂, who was on the bridge watch, reported the entry to Tokyo MARTIS.

Officer B₂ reported to Tokyo MARTIS that Vessel B would anchor near Kawasaki Section, Keihin Port, and then head for the berth in the same Section. However, Officer B₂ was unable to inform Tokyo MARTIS of the location of the scheduled anchorage because he had not heard the specific location of the anchorage from Master B and was asked to report it again as soon as he found it, and then terminated the communication.

Officer B₁ went up to the bridge at around 3:20, and after taking over the information of the vessel sailing on the bow from Officer B₂, he was on sole bridge watch.

Officer B₁ reported Vessel B's position to Tokyo MARTIS via the VHF because Vessel B had passed the Old Position Reporting (US) Line. After Tokyo MARTIS informed Officer B₁ that the

US Line had already been discontinued, Officer B₁ received an inquiry about the specific location of the planned anchorage.

When Officer B₁ told that he would anchor near Kawasaki Section, Keihin Port, he was asked by Tokyo MARTIS whether she would anchor at the anchorage K1 in the same Section, and although he did not hear the name of the anchorage from Master B and did not know the location of the K1 anchorage, he thought that the anchorage K1 that Tokyo MARTIS had predicted as the planned anchorage for Vessel B was the place where vessels for Kawasaki Section would anchor, and replied that it was the K1 anchorage.

VTS Operator continued to monitor Vessel B on the radar as a vessel obliged to navigate Nakanose Traffic Route because Vessel B was scheduled to anchor at the anchorage K1 located north of the line drawn from the Yokohama Daikoku East Breakwater Lighthouse to a point of 114 ° 11,000 m (hereinafter referred to as "Line b").

(See Figure 3)

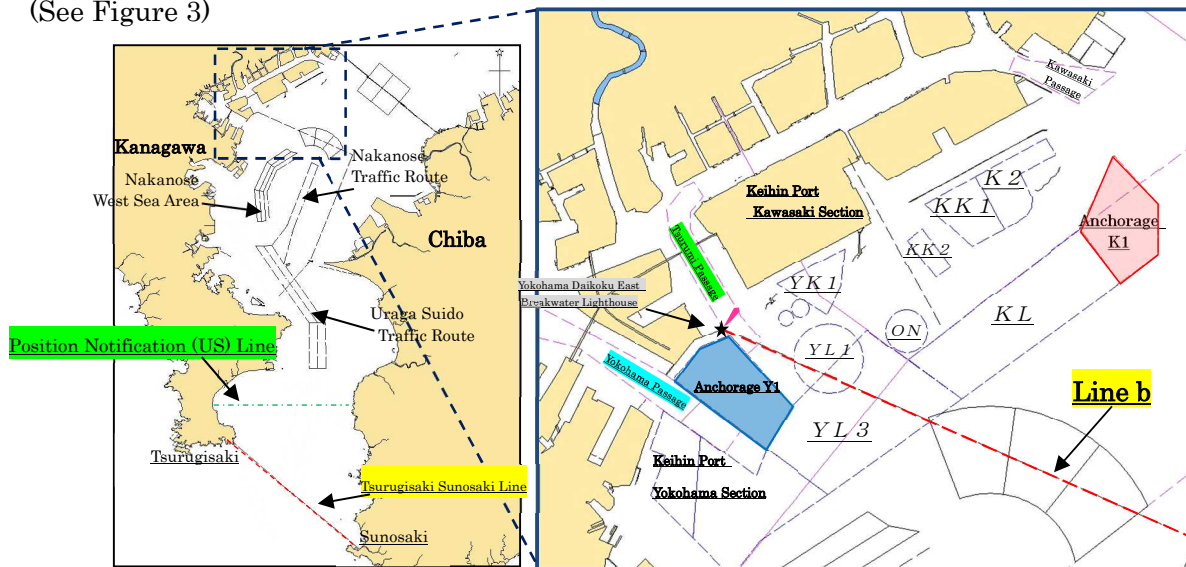


Figure 3 Tokyo Bay

Vessel B passed the south entrance of Uraga Suido Traffic Route and proceeded north on the Traffic Route. When she reached the vicinity of light buoy No.2, Officer B₁ changed her course approximately 325 ° along the Traffic Route with the hand steering.

Officer B₁ set the radar with a 1.5 M range on the course up display to reflect 2.5 M forward and 0.5 M aft with the off-center function, kept a lookout toward the bow by visual observation and radar.

Vessel B proceeded northwestward on the right side of the Uraga Suido Traffic Route at a speed of approximately 10.5 kn.

Officer B₁ thought that if the vessel which was proceeding toward Nakanose Traffic Route behind Vessel B caught up with her, Vessel B would obstruct the other vessel's navigation, so she navigated her course approximately 320 ° on the center of Uraga Suido Traffic Route. After passing the southwest of Daini Kaiho, Vessel B returned her course to approximately 325 ° on the center of Uraga Suido Traffic Route and continued to proceed northwestward.

At around 04:19, Officer B₁ was called by Tokyo MARTIS on the VHF, so he changed the frequency to 14 CH. Tokyo MARTIS informed that Vessel B was obliged to navigate the Nakanose Traffic Route, and as Vessel B was about to approach the north exit of Uraga Suido Traffic Route, Officer B₁ thought that he could not enter the Nakanose Traffic Route by turning short of the Buoy

on the starboard bow unless he turned to starboard immediately, so he told VTS Operator that he would turn, and immediately tried to turn to starboard, put down the VHF receiver and set it back to 16 CH.

VTS Operator continued to communicate with Vessel B on 14 CH on the VHF to pay attention because Vessel A was navigating behind her, but he did not get any response. Therefore, he changed the frequency to 16 CH and kept calling Vessel B to pay attention, but there was no response from Vessel B.

Officer B₁, after decelerating Vessel B, put the rudder to starboard 40 °, and then decided to put the rudder to port 10 ° to 15 ° for the purpose of steady the course, because he was sure that Vessel B could turn short of the Buoy.

Immediately after Officer B₁ saw Vessel A very close to the bow, and the bow collided with the port bow of Vessel A.

Master B, feeling the impact, went up to the bridge, saw Vessel A very close to Vessel B, and learned that Vessel B had collided with Vessel A, reported the occurrence of the accident to the Japan Coast Guard via the VHF, confirmed that there was no flooding, and then resumed navigation toward the anchorage Y1.

The date and time of occurrence of this accident were around 04:22:32 on October 15, 2019, and the location was around 317° true bearing, 1.3M from Daini Kaiho Lighthouse.

(See Attached Figure 1 Estimated Navigation Routes, Voice and Sound Record on S-VDR of Vessel A (Excerpt) and VHF Communications Records of Tokyo MARTIS (Excerpt))

2.2 Injuries to Persons

According to the statements of Master A, Pilot A, Master B, and Officer B₁, there were no casualties in Vessel A and Vessel B.

2.3 Damage to Vessels

(1) Vessel A

According to the statement of Master A and the reply to the questionnaire by the Japan Coast Guard, Vessel A sustained a dent and abrasions on her port bow's shell plating, as well as abrasions on her starboard bow's shell plating. (See Photo 1)



Photo 1 State of damage to Vessel A

(2) Vessel B

According to the statement of Officer B₁ and the reply to the questionnaire by the Japan Coast Guard, Vessel B sustained a pressure collapse on her bow bulwark and fractures on her foremast. (See Photo 2)

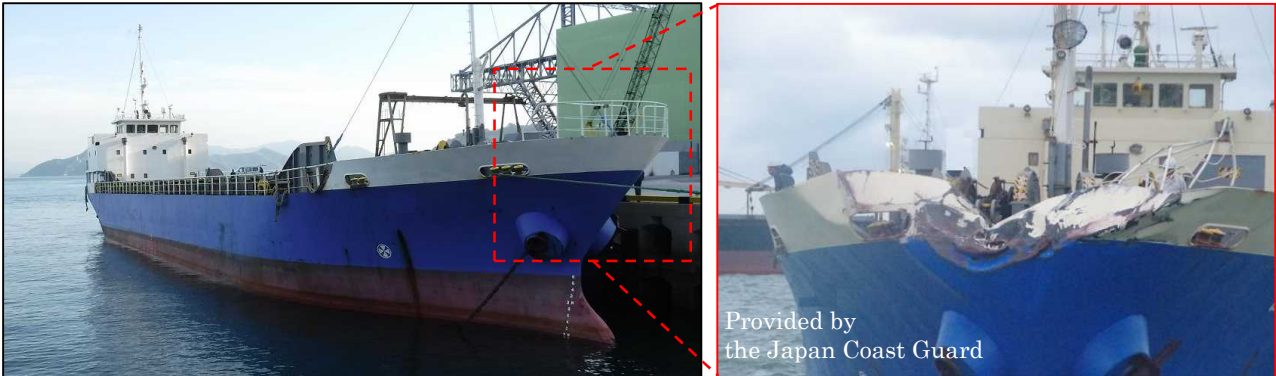


Photo 2 State of damage to Vessel B

(3) The Buoy

According to the reply to the questionnaire by the Japan Coast Guard, the Buoy sustained damaged recessed parts on the guard frame and other parts, as well as fractures and other damages on the marking apparatus sensor. (See Photo 3)

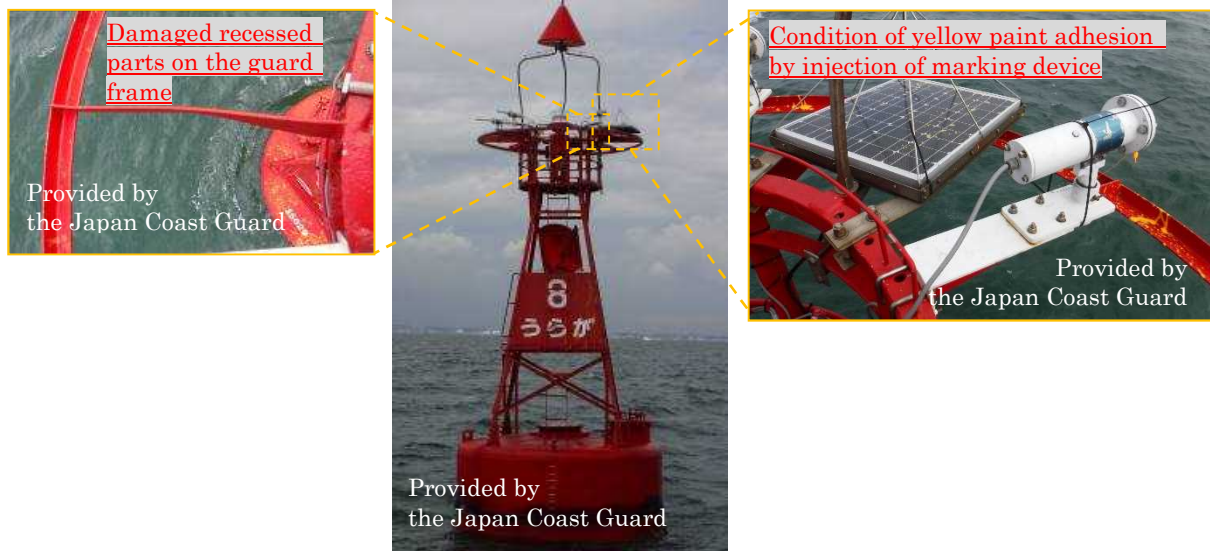


Photo 3 State of damage to the Buoy

2.4 Crew Information

(1) Gender, Age, and Certificate of Competence

1) Master A: Male, 48 years old

National of the People's Republic of China

Endorsement attesting the recognition of certificate under STCW regulation I/10: Master (Issued by the Republic of Singapore)

Date of Issue: July 26, 2017

(Valid until July 9, 2020)

2) Pilot A: Male, 62 years old

Tokyo Bay Pilot District First Grade Pilot's License

Date of Issue: January 18, 2017

Date of Revalidation: January 18, 2017

Date of Expiry: January 17, 2022

3) Master B: Male, 74 years old

Fifth Grade Maritime Officer (Navigation)

Date of Issue: February 18, 1977

Date of Revalidation: January 21, 2016

Date of Expiry: March 13, 2021

4) Officer B₁: Male, 69 years old

Fifth Grade Maritime Officer (Navigation)

Date of Issue: October 23, 1981

Date of Revalidation: March 14, 2016

Date of Expiry: March 19, 2021

(2) Sea-going Experience, etc.

According to the statements of Master A, Pilot A, Master B, and Officer B₁, their experience was as follows.

1) Master A

Master A started to serve as the master of a container ship from around 2008 and had served on Vessel A as a master since around 2017. He had experienced navigating the Uraga Suido

Traffic Route 10 to 15 times.

At the time of the accident, his health condition was good and his vision and audibility were normal.

2) Pilot A

Pilot A has been engaged in first-grade pilotage operations in Tokyo Bay since March 2017 and has engaged in pilotage operations on the Uraga Suido Traffic Route using container ships and other vessels about 300 times.

At the time of the accident, his health condition was good and his vision and audibility were normal.

3) Master B

Master B had approximately 23 years of experience as a master of coastal vessels, approximately 3 years and 6 months of experience as a master of Vessel B and other vessels, and had many times of experience navigating the Uraga Suido Traffic Route with coastal vessels with a length overall of approximately 50 m or more.

At the time of the accident, his health condition was good and his vision and audibility were normal.

4) Officer B₁

Officer B₁ had navigated in Tokyo Bay with a vessel of less than 50 m in length overall of the company he had worked for several years before. He boarded Vessel B for the first time on September 23, 2019, and had never anchored in Kawasaki and Yokohama Sections. He did not know the name of the anchorage area in those Sections, nor did he know that vessels of 50 m or more in length overall sailing between the mouth of Tokyo Bay and Line b were obliged to navigate Uraga Suido Traffic Route and Nakanose Traffic Route.

At the time of the accident, his health condition was good and his vision and audibility were normal.

2.5 Vessel Information

2.5.1 Particulars of Vessels

(1) Vessel A

IMO Number:	9234123
Port of Registry:	Singapore, Republic of Singapore
Owner:	CMB Ocean 12 Leasing Company Pte.Ltd. (Republic of Singapore)
Management Company:	CMA CGM INTERNATIONAL SHIPPING Company Pte.Ltd. (Republic of Singapore)
Classification Society:	DNV GL
Gross Tonnage:	25,305 tons (Maximum load capacity of the container 2,500 TEU*1)
L×B×D:	207.40 m x 29.80m x 16.40 m
Hull Material:	Steel
Engine:	Diesel engine x 1
Output:	21,560 kW

*1 “TEU: Twenty-foot Equivalent Unit” refers to the number of containers when a 20-foot container is considered to be one unit.

Propulsion: 5-blade fixed pitch propeller x 1
 Date of launch: November 2001.

(2) Vessel B

Vessel Number: 136463
 Port of Registry: Imabari City, Ehime Prefecture
 Owner: Taizan Shipping Limited Company
 Management Company: Shinwa Co.,Ltd.(hereinafter referred to as "Company B₁")
 Operator: Kotobukikisen Co.,Ltd. (hereinafter referred to as "Company B₂")
 Gross Tonnage: 391 tons
 L×B×D: 69.92m x 11.00m x 6.50 m
 Hull Material: Steel
 Engine: Diesel engine x 1
 Output: 736 kW
 Propulsion: 4-blade fixed pitch propeller x 1
 Date of launch: December 1998

2.5.2 Loading Conditions

(1) Vessel A

According to the statement of Master A, at the time of the accident Vessel A was loaded with 581 containers, while the draft was about 7.40 m at the fore and about 8.20 m at the stern.

(2) Vessel B

According to the person in charge of Company B₂, at the time of the accident Vessel B was loaded with 1,049 tons of ferromanganese, while the draft was about 3.60 m at the fore and about 3.88 m at the stern.

2.5.3 Information on the Vessel's Equipment, etc.

(1) Vessel A

Vessel A had a steering stand in the center of the bridge, a control panel for the main engine and VHF on the starboard side, and two radars, two ECDIS, and VHF on the starboard side of the front of the bridge.

According to the statement of Master A, at the time of the accident, there was no malfunction or failure of the hull, engine, and other equipment.

(See Figure 4)

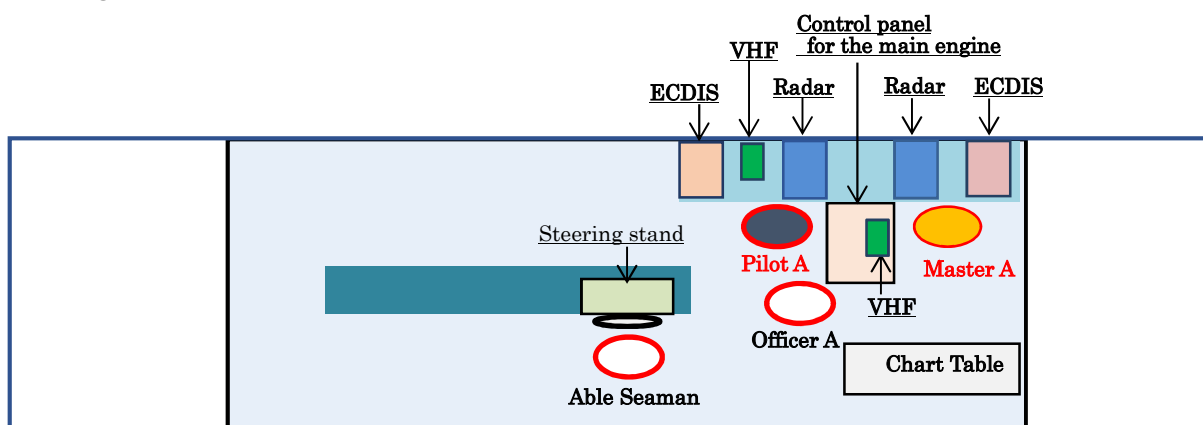


Figure 4 Arrangement of navigation equipment in the bridge of Vessel A

(2) Vessel B

Vessel B had a steering stand in the center of the front part of the bridge, a GPS plotter and radar on the port side, a control panel for the main engine on the starboard side, and VHF on the rear wall.

According to the statements of Master B and Officer B₁, at the time of the accident, there was no malfunction or failure of the hull, engine, and other equipment. However, according to the person in charge of Company B₂, at the time of the accident, a crew onboard unintentionally touched the switch of the simplified AIS (Destination information input/output disabled) that was installed on Vessel B, and therefore the AIS was switched off.

(See Figure 5)

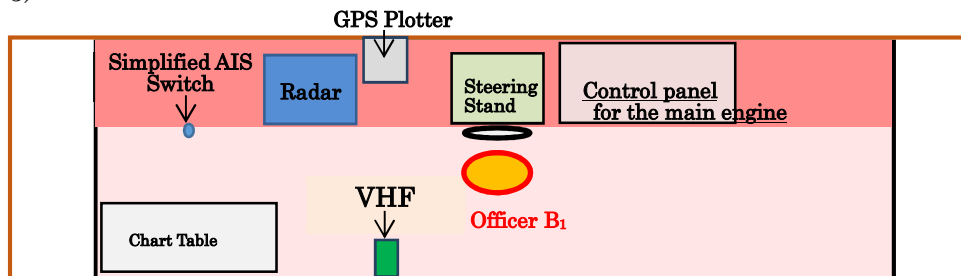


Figure 5 Arrangement of navigation equipment in the bridge of Vessel B

2.5.4 Information on Maneuverability

(1) Vessel A

According to the Maneuverability characteristics table of Vessel A, the turning and stopping performance in ballast condition (draft: 4.55 m at the fore and 7.00 m at the stern) was as follows.

1) Stopping distance and time (From when full astern ordered until vessel stopping)

Speed before astern order issued	Distance	Time
Full speed at sea (approx. 20.5 kn)	Approx. 1,900 m	Unknown

2) Turning characteristics (at rudder angle 35°)

Turning direction	Speed	Advance* ²	Transfer* ³	Time
Starboard turn	Approx. 13.0 kn	764.9 m	637.1 m	120 sec.
Port turn	Approx. 13.0 kn	587.1 m	527.8 m	118 sec.

(2) Vessel B

According to the sea trial results of Vessel B, the stopping and turning performance in ballast condition (draft: 1.5 m at the fore and 3.2 m at the stern) was as follows.

Stopping distance and time (From when full astern ordered until vessel stopping)

Speed before astern order issued	Distance	Time
Approx. 12.0 kn	Unknown	83 sec.

*² “Advance” refers to an advancement distance of the center of ship gravity toward the original course from the center of ship gravity at the start of turning to when the ship is turned 90°.

*³ “Transfer” refers to the lateral movement distance on the original course between the hull center of gravity when the steering was turned, and the center of gravity when the vessel turned at 90°.

2.5.5 View from the Bridge

(1) Vessel A

There were no obstacles that would obstruct the lookout in visibility from the bridge to the bow.

(2) Vessel B

There were no obstacles that would obstruct the lookout in visibility from the bridge to the bow, as well as from the bridge starboard side to the starboard stern side.

2.6 Weather and Sea Conditions

2.6.1 Weather and Sea Observations

(1) Observations at Yokohama Local Meteorological Observatory located about 13.8 km NNE side of the accident site were as follows.

October 15 04:20 Wind speed 2.4 m/s, Wind direction ENE

04:30 Wind speed 1.1 m/s, Wind direction ENE

(2) According to tide tables published by the Japan Coast Guard, the tide in Yokosuka at the time of the accident was in the final phase of a rising tide and the height was 163 cm. Moreover, the current in the area approximately 1.1 M SSW from Daini Kaiho Lighthouse changed direction from southeast to northwest at 23:24, reached its maximum speed at 02:49, and had the speed of approx. 1.0 kn at 04:22.

Time of current flow change	Time of maximum current speed	Around 04:22	
		Flow direction (true bearing)	Speed (kn)
23:24	02:49	323°	Approx. 1.0

(3) Time of sunrise

According to the astronomical calendar issued by the Japan Coast Guard, the time of sunrise at Yokosuka Port on October 15 was around 05:47.

2.6.2 Observations by Crew Members

According to the statement of Pilot A, at the time of the accident, the weather was clear, while the wind was blowing northeast with a 2-3 wind force. Moreover, the sea was calm, and the visibility was good.

2.7 Information on Vessel B's Navigation Plan, etc.

(1) According to the statement of Master B, Master B was planning to anchor at Anchorage Y1 south of Line b and had no obligation to navigate Nakanose Traffic Route, so he had a navigation plan to anchor at Anchorage Y1 via Uruga Suido Traffic Route and Nakanose West Sea Area, and then weigh anchor and navigate toward the company berth in Kawasaki Section, Keihin Port.

(2) According to statements from Master B and Officer B₁, Vessel B did not have a navigation plan, etc. on its bridge, which describes the planned anchorage, the port of destination, etc.

2.8. Information Sharing and Communication Record on the VHF

(1) Vessel A

According to the statements of Master A and Pilot A, the situation was as follows.

1) Master A could not understand the contents of the communication between Tokyo MARTIS, Vessel B, and Pilot A as they were communicating in Japanese.

- 2) At the time of the accident, Pilot A thought that he could overtake Vessel B without any difficulties, so he thought that he did not have to communicate with Vessel B on the VHF nor make a whistle signal to overtake.
- 3) Since Pilot A intercepted the communication that Vessel B was a vessel obliged to navigate Nakanose Traffic Route with VHF at 14 CH and immediately returned it to 16 CH, he could not intercept Officer B₁'s transmission to Tokyo MARTIS that Vessel B was turning.
- 4) Pilot A did not have time to explain the content of the communication to Master A as he obtained the information about Vessel B's destination from Tokyo MARTIS only immediately before the accident occurred.

(2) Vessel B

According to the statements of Master B and Officer B₁, the situation was as follows.

- 1) Officer B₂ had not heard the specific location of the planned anchorage from Master B, and had forgotten to take over the duty shift with Officer B₁ to inform Tokyo MARTIS of the location of the planned anchorage.
- 2) Officer B₁ replied to the Tokyo MARTIS that it was the anchorage K1 without confirming the planned anchorage name, but did not confirm with the chart after the communication because he did not know that the anchorage name was written on the chart.
- 3) Officer B₁ recognized that all communications by the Tokyo MARTIS to vessels meant instructions, and when he received information from the Tokyo MARTIS that she was obligated to navigate the Nakanose Traffic Route, he thought it was an instruction, and thought it necessary to enter the Nakanose Traffic Route immediately.
- 4) Officer B₁ did not listen to the information provided by the Tokyo MARTIS to Vessel B on VHF 14 CH because he had already returned VHF of Vessel B to 16 CH when Tokyo MARTIS provided Vessel B with information on Vessel A behind.
- 5) At the time of the accident, Officer B₁ was cautious of making a starboard turn, so he did not notice the call to Vessel B by the Tokyo MARTIS and Pilot A on VHF 16 CH.

(3) Tokyo MARTIS

According to the statement of VTS operator, the VTS Operator provided information to Vessel B that she was obliged to navigate the Nakanose Traffic Route because Vessel B for the anchorage K1 did not appear to turn to starboard after passing the southwest of Daini Kaiho while being monitored by radar.

2.9 Information on Lookout and Maneuvering

(1) Vessel A

According to the statement of Pilot A, at the time of the accident, Vessel B was not giving a course signal by whistle, but because vessels entering Nakanose Traffic Route from Uraga Suido Traffic Route usually did not give a course signal, Pilot A was not able to determine the destination of Vessel B based on the presence of the signal.

(2) Vessel B

According to the statement by Officer B₁, the situation was as follows.

- 1) When Officer B₁ took over the bridge watch from Officer B₂, he saw that several of the same sailing vessels on the stern side were more than 1.5 M away from Vessel B. Since the speed difference between vessels navigating the Uraga Suido Traffic Route, whose speed through the water was limited to 12 kn or less, was only around 1 kn, Officer B₁ thought that they would not be overtaken while navigating the Uraga Suido Traffic Route, so he turned his attention only to

vessels on the bow side and did not confirm behind.

2) At the time of the accident, Officer B₁ was cautious of turning to starboard, so he did not think of checking the starboard aft.

2.10 Information on the Bridge Watch System of Vessel B

According to Master B and the person in charge of Company B₂, as well as the Safety Management Regulation of Company B₂, the situation was as follows.

- (1) In the Safety Management Regulation of Company B₂, when Vessel B navigated the narrow channel, the master should command the vessel, and the person in charge of Company B₂ instructed all crew members to that effect when they visited the vessel.
- (2) Master B was usually on the bridge watch by himself when the watch time of an inexperienced officer was in the sea area where marine traffic such as Uraga Suido Traffic Route was congested, but because he had heard from Officer B₁ that he had navigated Tokyo Bay many times, so he appointed the bridge watch to the vicinity of the anchorage including Uraga Suido Traffic Route as Officer B₁.

2.11 Information relating to the Area of accident

(1) Information relating to the Area of accident

According to the sailing direction of the south and east coast of Honshu published by the Japan Coast Guard (published on March 2020), the area near Daini Kaiho was as follows.

The area near Daini Kaiho has heavy sea traffic, and it is an area where vessels need to pay the most attention.

(2) Notification of Entry and Obligations to Navigate on the Traffic Routes

In accordance with the amendment of the Maritime Traffic Safety Act on January 31, 2018, vessels of 50 m or more in length (Excluding vessels operating AIS) are obliged to report their name, port of destination, etc. when entering the designated sea area (Sea area covered by the Act in Tokyo Bay), and the previous position reporting was abolished.

According to the Ordinance for Enforcement of the Maritime Traffic Safety Act, vessels of 50 m or more in length navigating between Line b and the mouth of Tokyo Bay are obliged to navigate Uraga Suido Traffic Route and Nakanose Traffic Route.

(3) Provision of Information by VHF from Tokyo MARTIS

When providing information (Information and Warning), Advice, and Instruction based on laws and regulations such as the Maritime Traffic Safety Act, the Tokyo MARTIS clarifies the purpose of the communication by putting a communication code ("Information", "Warning", "Advice", "Instruction") at the beginning of the communication or in the corresponding part of the communication.

"Notice concerning methods of providing information, etc. by the TOKYO WAN Vessel Traffic Service Center and the Yokohama Ship Traffic Signal Station operated by the Center (2018 Japan Coast Guard Notification No. 5)" stipulates the following points to be noted.

Article 8

(x) The provision of information shall, for the purpose of assisting the safe navigation of vessels, convey to vessels the facts and circumstances observed at the Center, and shall not be intended to give instructions on the maneuvering the vessel.

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Course of the Events

According to 2.1 above, the following events occurred.

(1) Vessel A

- 1) It is highly probable that Vessel A passed the south entrance of the Uraga Suido Traffic Route at around 03:46 on October 15, 2019, and headed north along the Traffic Route toward Yokohama Section 2 of Keihin Port.
- 2) It is highly probable that at around 04:00, Vessel A changed her course from approx. 000° to 325° and proceeded northwest on Uraga Suido Traffic Route at the speed of approx. 12.6 to 13.0 kn.
- 3) It is highly probable that Vessel A altered her course from approx. 325° to 332° at around 04:17.
- 4) It is probable that Vessel A reduced her speed and started to turn to starboard at around 04:22.
- 5) It is probable that Vessel A collided with Vessel B immediately after decelerating and turning to starboard.

(2) Vessel B

- 1) It is highly probable that Vessel B passed the south entrance of the Uraga Suido Traffic Route at around 03:36 and proceeded north along the Traffic Route toward the anchorage Y1, Yokohama Section of Keihin Port.
- 2) It is probable that at around 03:52, Vessel B changed her course from approx. 000° to 325° and proceeded northwest on the right side of Uraga Suido Traffic Route at the speed of approx. 9.9 to 10.8 kn.
- 3) It is probable that Vessel B changed its course from approx. 325° to 320° at around 04:05, passed the southwest of Daini Kaiho, and after being located near the center of the Uraga Suido Traffic Route, changed its course to approx. 325°.
- 4) It is highly probable that Vessel B started to decelerate around 04:21 and then started to turn to starboard.
- 5) It is probable that Vessel B collided with Vessel A while turning to starboard.

3.1.2 Date, Time, and Location of the Accident Occurrence

According to 2.1 above, it is highly probable that the following events occurred.

(1) Date and Time of the Accident Occurrence

The accident occurred at around 04:22:32 on October 15, 2019, from the time when the impact sound was recorded in the S-VDR Voice and Sound Records.

(2) Location of the Accident Occurrence

The location of the accident based on the position of Vessel A and Vessel B at the time when the accident occurred was around 317° true bearing 1.3 M from Daini Kaiho lighthouse.

3.1.3 Damage to Vessels

According to 2.3 above, it is probable that the situation was as follows.

- (1) Vessel A sustained a dent and abrasions on her port bow's shell plating, as well as abrasions on her starboard bow's shell plating.
- (2) Vessel B sustained a pressure collapse on her bow bulwark and fractures on her

foremast.

- (3) The Buoy sustained damaged recessed parts on the guard frame and other parts, as well as fractures and other damages on the marking apparatus sensor.

3.1.4 Situation of the Collision

According to 2.1, 2.3, and 3.1.1 to 3.1.3 above, it is probable that Vessel A's port bow collided with Vessel B's bow immediately after Vessel A started to turn to starboard at the speed of approx. 12 kn, and when Vessel B was in the state of turning to starboard at the speed of approx. 6 kn. After that, it is probable that the starboard bow of Vessel A collided with the Buoy.

3.2 Causal Factors of the Accident

3.2.1 Situation of Crew Members

According to 2.1.2 and 2.4 above, the situation was as follows.

(1) Master A

Master A possessed a legally valid endorsement attesting to the recognition of certificate under STCW regulation I/10.

It is probable that he was in good health at the time of the accident and his vision and audibility were normal.

(2) Pilot A

Pilot A possessed a legally valid pilot's certificate.

It is probable that he was in good health at the time of the accident and his vision and audibility were normal.

(3) Master B and Officer B₁

Master B and Officer B₁ possessed a legally valid certificate of competence.

It is probable that they were in good health at the time of the accident and their vision and audibility were normal.

3.2.2 Condition of the Vessels

According to 2.1 and 2.5.3, it is probable that at the time of the accident, Vessel A and Vessel B were navigating with the navigation lights on and without any defect or failure in their hulls, engines, or equipment, and that Vessel B was powered off by the simplified AIS.

3.2.3 Weather and Sea Conditions

According to 2.6, it is probable that at the time of the accident, the weather was clear with ENE wind blowing at force 2, the visibility was good, the tide was at the final phase of a rising tide and the tidal current was flowing northwest at a speed of approx. 1.0 kn.

3.2.4 Analysis of the Navigational Plan of Vessel B

According to 2.1.2 and 2.7, it is probable that Master B was planning to anchor Vessel B in Anchorage Y1 south of Line b, and because she had no obligation to navigate Nakanose Traffic Route, he planned to anchor Vessel B in Anchorage Y1 via Uruga Suido Traffic Route and Nakanose West Sea Area, and then weigh anchor and navigate to the company berth in Kawasaki Section, Keihin Port. However, it is considered probable that no navigation plan describing the scheduled anchorage, destination port, etc. had been prepared on the bridge.

3.2.5 Analysis of Information Sharing and Communication Record on the VHF

According to 2.1.2, 2.8, and 2.9, the situation was as follows.

(1) Vessel A

- 1) It is highly probable that Master A could not understand what communicated between Tokyo MARTIS with Vessel B and Pilot A because they were communicating in Japanese.
- 2) It is probable that Pilot A predicted that Vessel A would overtake Vessel B near the north exit of the Uraga Suido Traffic Route since Vessel A's speed was faster than Vessel B's and informed Master A that Vessel A would overtake Vessel B on the starboard side, and Master A accepted the proposal of Pilot A, as Vessel B being no sign of turning to starboard toward the Nakanose Traffic Route, and that Vessel A would be able to easily overtake Vessel B on the starboard side.
- 3) At the time of the accident, it is probable that Pilot A thought that he could overtake Vessel B without any difficulties, so he thought that did not have to communicate with Vessel B on the VHF nor make a whistle signal for overtaking.
- 4) It is probable that when Pilot A intercepted the communication by VHF to the effect that the Vessel was a vessel obliged to navigate Nakanose Traffic Route, he predicted that even if Vessel B was the Vessel, Vessel B would soon approach the north exit of the Uraga Suido Traffic Route and would depart from the north exit of the Uraga Suido Traffic Route, and judged that Vessel B would not turn to starboard toward the Nakanose Traffic Route.
- 5) It is highly probable that immediately after Pilot A heard the communication on VHF 14 CH to the effect that Vessel B was a vessel obliged to navigate Nakanose Traffic Route, Pilot A returned to 16 CH to concentrate on maneuvering and failed to monitor Officer B₁'s message to Tokyo MARTIS to turn.
- 6) It is highly probable that Pilot A did not have time to explain the contents of the communication to Master A because the information on the destination of Vessel B was provided by Tokyo MARTIS immediately before the occurrence of the accident.

(2) Vessel B

- 1) It is probable that Master B informed Officer B₁ of the route via Uraga Suido Traffic Route and the sea area to the west of Nakanose and indicated the location of the scheduled anchorage by pointing to the anchorage Y1 between Tsurumi Passage and Yokohama Passage on the chart, but that Officer B₁ did not know that the name of the scheduled anchorage was anchorage Y1.
- 2) It is probable that when Officer B₁ was asked by Tokyo MARTIS whether to anchor at anchorage K1, Officer B₁ thought that anchorage K1 that Tokyo MARTIS assumed to be the scheduled anchorage of Vessel B was a designated anchorage for vessels proceeding toward Kawasaki Section, therefore, he replied that Vessel B's scheduled anchorage was at anchorage K1 despite that Officer B₁ did not know the name of Vessel B's scheduled anchorage, which was Y1, and the location of the mentioned anchorage K1.
- 3) It is probable that Officer B₁ replied to Tokyo MARTIS that it was the anchorage K1 without confirming the planned anchorage name, and he did not know that the name of the anchorage was written on the chart, so he did not confirm it on the chart after the communication.
- 4) It is probable that Officer B₁, recognizing that all communications by Tokyo MARTIS to vessels meant instructions, upon receiving information from Tokyo MARTIS to the effect that she was obligated to navigate Nakanose Traffic Route, thought that this information was an instruction, and immediately after telling VTS Operator that he was going to turn right,

returned VHF to 16 CH.

5) It is highly probable that when Tokyo MARTIS provided Vessel B with information about Vessel A behind her on VHF 14 CH, Officer B₁ had already returned the VHF frequency to 16 CH, so he could not hear the information.

6) It is probable that Officer B₁ did not notice the calling of Vessel B on VHF 16 CH by Tokyo MARTIS and Pilot A because he was cautious of making a right turn at the time of the accident.

(3) Tokyo MARTIS

1) It is highly probable that VTS Operator, upon receiving a reply from Officer B₁ to the effect that the planned anchorage for Vessel B was the anchorage K1 located north of Line b, kept monitoring Vessel B on the radar as a vessel that obliged to navigate Nakanose Traffic Route.

2) It is highly probable that VTS operator provided Vessel B with information at around 04:20 that she was obliged to navigate the Nakanose Traffic Route because Vessel B did not appear to turn to starboard toward the Traffic Route after passing the southwest of Daini Kaiho while being monitored by radar.

3.2.6 Situation of Lookout and Maneuvering

According to 2.1, 2.9, 3.1, and 3.2.1 to 3.2.3, the situation was as follows.

(1) Vessel A

1) It is probable that at the time of the accident, was not giving a course signal by whistle, but because vessels entering Nakanose Traffic Route from Uraga Suido Traffic Route usually did not give a course signal, Pilot A was not able to determine the destination of Vessel B based on the presence of the signal.

2) It is probable that Pilot A thought that Vessel B was heading for the north exit of Uraga Suido Traffic Route because Pilot A saw by sight and on the radar that Vessel B, which was proceeding on the same course by approaching the right side of the Traffic Route at approximately 1 M on the starboard bow, changed its course from approximately 325 ° to approximately 320 ° toward the center of the Traffic Route and crossed on the bow of Vessel A from starboard to port.

3) It is highly probable that Vessel A altered her course from approximately 325° to approximately 332° toward Vessel B's starboard side at around 04:17 because Pilot A confirmed that Vessel B was proceeding northwest without entering Nakanose Traffic Route even after passing the southwest side of Daini Kaiho.

4) It is probable that Pilot A noticed that at around 04:19 Vessel B had returned her course to approximately 325°, so the overtaking distance was smaller than originally planned, but since Vessel B was proceeding northwest toward the north exit of the Uraga Suido Traffic Route, not turning to starboard toward Nakanose Traffic Route, thinking Vessel A could safely overtake the starboard side of Vessel B and continued to proceed northwest.

5) It is probable that Pilot A continued to navigate, paying attention to Vessel B and the Buoy on the starboard bow, to maintain a safe passage distance.

6) It is probable that, Pilot A, immediately after receiving information from Tokyo MARTIS at around 04:21 that Vessel B was the Vessel and was destined for the anchorage K1, visually noticed that Vessel B began to turn to starboard and immediately called Vessel B on the VHF, but no response was obtained, and that Pilot A put the main engine to neutral operation, Master A put the helm hard to starboard, and blew one long blast of the whistle.

(2) Vessel B

- 1) It is probable that after Officer B₁, upon taking over the bridge watch from Officer B₂, noticed that several vessels on the stern side of Vessel B were more than 1.5 M away from Vessel B. The speed difference between the vessels on the Uraga Suido Traffic Route, whose speed through the water was limited to 12 kn or less, was only around 1 kn, and he thought that they would not be overtaken while navigating the Traffic Route. Therefore, Officer B₁ was turning his attention only to the vessels on the bow side and was proceeding without looking behind.
- 2) It is probable that Vessel B proceeded northwestward on the Uraga Suido Traffic Route without noticing the approach of Vessel A on her stern side because Officer B₁ set the radar with a 1.5 M range in the course-up display to reflect 2.5 M toward the bow and 0.5 M toward the stern with the off-center function.
- 3) It is probable that, although Vessel B, which was scheduled to depart from the north exit of the Uraga Suido Traffic Route, was proceeding northwestward by approaching the right edge of the Uraga Suido Traffic Route, Officer B₁ thought that if the following vessel for the Nakanose Traffic Route came up with Vessel B, Vessel B would obstruct the following vessel's navigation, and decided to proceed toward the center of the Uraga Suido Traffic Route, and after passing through the southwest of Daini Kaiho with a course of approximately 320°, Vessel B returned its course to approximately 325° and continued proceeding northwestward after being positioned near the center of the Uraga Suido Traffic Route.
- 4) It is probable that Officer B₁, recognizing that all communications by Tokyo MARTIS to vessels meant instructions, upon receiving information from Tokyo MARTIS to the effect that she was obliged to navigate the Nakanose Traffic Route, thought that this information was an instruction, Vessel B was approaching the north exit of the Uraga Channel Traffic Route soon and thought that she had to enter the Nakanose Traffic Route immediately and that she would not be able to enter the Nakanose Traffic Route by turning in front of the Buoy on the starboard bow unless Vessel B immediately turned to starboard.
- 5) It is probable that at the time of the accident, Officer B₁ was cautious of turning to starboard, so he did not think of checking the starboard aft.
- 6) It is probable that Officer B₁ was convinced that Vessel B could turn short of the Buoy after taking the rudder to starboard 40 ° after decelerating, when Vessel B took the rudder to port 10 ° to 15 ° for the purpose of steady the course, Officer B₁ saw Vessel A very close to the bow.

3.2.7 Analysis of the Bridge Watch System of Vessel B

According to 2.4(2) and 2.10, the situation was as follows.

- (1) It is probable that, in the Safety Management Regulation of Company B₂, when Vessel B navigated the narrow channel, the master should command the vessel, and the person in charge of Company B₂ instructed all crew members to that effect when they visited the vessel.
- (2) It is highly probable that Master B was usually on the bridge watch by himself when the watch time of an inexperienced officer was in the sea area where marine traffic such as Uraga Suido Traffic Route was congested, but because he had heard from Officer B₁ that he had navigated Tokyo Bay many times, so he appointed the bridge watch to the vicinity of the anchorage including Uraga Suido Traffic Route as Officer B₁.
- (3) It is probable that Master B was not aware that Officer B₁ had no experience navigating a vessel with more than 50 m in length in Tokyo Bay.
- (4) It is probable that, Master B, who did not know the career of Officer B₁, entrusted Officer B

to watch the bridge on the Uraga Suido Traffic Route, where many vessels frequently came and went, however, Master B was able to accurately inform the Tokyo MARTIS of the destination by observing the Safety Management Regulation of Company B₂ and taking command of Vessel A by himself on the Traffic Route, thereby preventing the occurrence of this accident.

3.2.8 Analysis of the Accident Occurrence

According to 2.1, 3.1, and 3.2.2 to 3.2.5, the situation was as follows.

- (1) It is probable that Master B informed Officer B₁ of the route via Uraga Suido Traffic Route and the sea area to the west of Nakanose and indicated the location of the scheduled anchorage by pointing to the anchorage Y1 between Tsurumi Passage and Yokohama Passage on the chart, but that Officer B₁ did not know that the name of the scheduled anchorage was anchorage Y1.
- (2) It is probable that when Officer B₁ was asked by Tokyo MARTIS whether to anchor at anchorage K1, Officer B₁ thought that anchorage K1 that Tokyo MARTIS assumed to be the scheduled anchorage of Vessel B was a designated anchorage for vessels proceeding toward Kawasaki Section, therefore, he replied that Vessel B's scheduled anchorage was at anchorage K1 despite that Officer B₁ did not know the name of Vessel B's scheduled anchorage, which was Y1, and the location of the mentioned anchorage K1.
- (3) It is highly probable that VTS Operator, upon receiving a reply from Officer B₁ to the effect that the planned anchorage for Vessel B was the anchorage K1 located north of Line b, kept monitoring Vessel B on the radar as a vessel that obliged to navigate Nakanose Traffic Route.
- (4) It is highly probable that Vessel A was heading to Yokohama Section 2 of Keihin Port on the port quarter of Vessel B, and Vessel B was heading to anchorage Y1 of Yokohama Section of Keihin Port, both proceeding northwestward on the Uraga Suido Traffic Route.
- (5) It is probable that Officer B₁ was scheduled to depart from the north exit of the Uraga Suido Traffic Route, and thought that if the following vessel for the Nakanose Traffic Route came up with Vessel B, Vessel B, which was proceeding northwest along the right edge of the Uraga Suido Traffic Route, would obstruct the following vessel's navigation, and decided to proceed toward the center of the Uraga Suido Traffic Route.
- (6) It is probable that Vessel B took a course of approximately 320 ° and passed the southwest of Daini Kaiho.
- (7) It is probable that Pilot A thought that Vessel B was heading for the north exit of Uraga Suido Traffic Route because Pilot A saw by sight and on the radar that Vessel B, which was proceeding on the same course by approaching the right side of the Traffic Route at approximately 1 M on the starboard bow, changed its course from approximately 325 ° to approximately 320 ° toward the center of the Traffic Route and crossed on the bow of Vessel A from starboard to port.
- (8) It is probable that at around 04:13, Pilot A predicted that Vessel A would overtake Vessel B near the north exit of the Uraga Suido Traffic Route since Vessel A's speed was faster than Vessel B's and informed Master A that Vessel A would overtake Vessel B on the starboard side, and Master A accepted the proposal of Pilot A, as Vessel B being no sign of turning to starboard toward the Nakanose Traffic Route, and that Vessel A would be able to easily overtake Vessel B on the starboard side.
- (9) It is highly probable that Vessel A altered her course from approximately 325° to approximately 332° toward Vessel B's starboard side at around 04:17 because Pilot A confirmed that Vessel B was proceeding northwest without entering Nakanose Traffic Route even after

- passing the southwest side of Daini Kaiho.
- (10) It is probable that Vessel B returned its course to approximately 325° and continued proceeding northwestward after being positioned near the center of the Uraga Suido Traffic Route.
 - (11) It is probable that Pilot A noticed that at around 04:19 Vessel B had returned her course to approx. 325°, so the overtaking distance was smaller than originally planned, but since Vessel B was proceeding northwest toward the north exit of the Uraga Suido Traffic Route, not turning to starboard toward Nakanose Traffic Route, thinking Vessel A could safely overtake the starboard side of Vessel B and continued to proceed northwest, believing that it would be possible to overtake Vessel B safely without informing her of the intention to overtake the starboard side by means of VHF communications and by means of whistle signals for overtaking.
 - (12) It is highly probable that VTS operator provided Vessel B with information at around 04:20 that she was obliged to navigate the Nakanose Traffic Route because Vessel B did not appear to turn to starboard toward the Traffic Route after passing the southwest of Daini Kaiho while being monitored by radar.
 - (13) It is highly probable that Officer B₁, recognizing that all communications by Tokyo MARTIS to vessels meant instructions, upon receiving information from Tokyo MARTIS to the effect that she was obliged to navigate Nakanose Traffic Route, thought that this information was an instruction, and immediately after telling VTS Operator that he was going to turn right, returned VHF to 16 CH, therefore had not heard VHF 14 CH from Tokyo MARTIS providing information about Vessel A behind her.
 - (14) It is probable that when Pilot A intercepted the communication by VHF to the effect that the Vessel was a vessel obliged to navigate Nakanose Traffic Route, he predicted that even if Vessel B was the Vessel, Vessel B would soon approach the north exit of the Uraga Suido Traffic Route and would depart from the north exit of the Uraga Suido Traffic Route, and judged that Vessel B would not turn to starboard toward the Nakanose Traffic Route.
 - (15) It is probable that Officer B₁, under the circumstances that he thought that the speed difference of vessels navigating the Uraga Suido Traffic Route with speed limitation was small and that Vessel B would not be overtaken, received information from Tokyo MARTIS that Vessel B was obliged to navigate the Nakanose Traffic Route, and thought it necessary to enter the Nakanose Traffic Route immediately because he thought it was an instruction, and that Officer B₁, thinking that it would be impossible to enter the Nakanose Traffic Route by turning short of the Buoy on the starboard bow without turning to starboard immediately, and was proceeding paying attention to turning to starboard toward the Nakanose Traffic Route while paying attention to other vessels on her bow.
 - (16) It is probable that Officer B₁ unaware of the call of Vessel B by Tokyo MARTIS and Pilot A on VHF 16 CH, decelerated at around 04:21 without knowing the existence of Vessel A and then turned to starboard.
 - (17) It is probable that, Pilot A, immediately after receiving information from Tokyo MARTIS at around 04:21 that Vessel B was the Vessel and was destined for the anchorage K1, visually noticed that Vessel B began to turn to starboard and immediately called Vessel B on the VHF, but no response was obtained, and that Pilot A put the main engine to neutral operation, Master A put the helm hard to starboard, and blew one long blast of the whistle.
 - (18) It is probable that, immediately after Vessel A started decelerating and turning to starboard, and while Vessel B was turning to starboard, the port bow of Vessel A collided with the bow of

Vessel B, and then the starboard bow of Vessel A collided with the Buoy.

(19) It is probable that the following factors contributed to the occurrence of the accident: Master B entrusted Officer B₁ with the bridge watch on Uraga Suido Traffic Route; Vessel B was on bridge watch by Officer B₁ while Master B and Officer B₁ did not properly share information necessary for navigation such as navigation plans; Officer B₁ communicated to Tokyo MARTIS the location different from the scheduled anchorage without knowing that the name of the scheduled anchorage was anchorage Y1, and continued the navigation without hearing the information concerning Vessel A provided by VHF from Tokyo MARTIS.

(See Table 3)

Table 3 Progress to the Accident Occurrence

Time (HH:MM)	Vessel A	Vessel B	Tokyo MARTIS
		Master B informed Officer B₁ of the route via Uraga Suido Traffic Route and the sea area to the west of Nakanose and indicated the location of the scheduled anchorage by pointing to the anchorage Y1 between Tsurumi Passage and Yokohama Passage on the chart, but that Officer B₁ did not know that the name of the scheduled anchorage was anchorage Y1 .	
03:22 ~ 03:24	Proceeded north on Uraga Suido Traffic Route.	Proceeded north on Uraga Suido Traffic Route.	VTS Operator asked Vessel B on the VHF whether to anchor at anchorage K1 .
	↓	When Officer B₁ was asked by Tokyo MARTIS whether to anchor at anchorage K1 , Officer B₁ thought that anchorage K1 which Tokyo MARTIS assumed to be the scheduled anchorage of Vessel B was a designated anchorage for vessels proceeding toward Kawasaki Section, therefore, he replied that Vessel B 's scheduled anchorage was anchorage K1 despite that Officer B₁ did not know the name of Vessel B 's scheduled anchorage, which was Y1 , and the location of the mentioned anchorage K1 .	↓
03:36 ~ 04:00	Vessel A , after passing the south entrance of the Uraga Suido Traffic Route and proceeding northwestward, changed her course from approx. 000° to approx. 325° and headed toward the north exit of the Uraga Suido Traffic Route.	Vessel B was proceeding north on Uraga Suido Traffic Route, and after altering her course from approx. 000° to approx. 325°, she proceeded northwest on the right side of Uraga Suido Traffic Route.	VTS Operator kept monitoring Vessel B on the radar as a vessel that obliged to navigate Nakanose Traffic Route, as the planned anchorage for Vessel B was the anchorage K1 located north of Line b.
	↓	Officer B₁ thought that the speed difference between the vessels on the Uraga Suido Traffic Route, whose speed was small, and he thought that they would not be overtaken while navigating the	↓

		Traffic Route. Therefore, he was turning his attention only to the vessels on the bow side and was proceeding without looking behind.	
04:05	↓	Altered her course to approx. 320°.	↓
		↓	↓
04:13 ~		↓	↓
		↓	↓
04:19 ~ 04:20		↓	↓
		↓	↓
	When Pilot A intercepted the communication by VHF to the effect that the Vessel was a vessel obliged to navigate Nakanose Traffic Route, he predicted that even if Vessel B was the Vessel, Vessel B would soon approach the north exit of the Uraga Suido Traffic Route and would depart from the north exit of the Uraga Suido Traffic Route, and judged that Vessel B would not turn to	Officer B₁ , recognizing that all communications by Tokyo MARTIS to vessels meant instructions, upon receiving information from Tokyo MARTIS to the effect that she was obliged to navigate Nakanose Traffic Route, thought that this information was an instruction, and immediately after telling VTS Operator that he was going to turn right, returned VHF to 16 CH.	VTS operator provided Vessel B with information that she was obliged to navigate the Nakanose Traffic Route because Vessel B did not appear to turn to starboard toward the Traffic Route after passing the southwest of Daini Kaiho while being monitored by

	starboard toward the Nakanose Traffic Route.		radar. VTS Operator communicated with Vessel B on 14 CH on the VHF to pay attention because Vessel A was navigating behind Vessel B , but he did not get any response.
04:21 ~ 04:22	Pilot A , immediately after receiving information from Tokyo MARTIS that Vessel B was the Vessel and was destined for the anchorage K1, visually noticed that Vessel B began to turn to starboard and immediately called Vessel B on the VHF, but no response was obtained, and that Vessel A set the main engine to neutral operation, set the helm hard to starboard, and blew one long blast of the whistle.	Officer B₁ , while being cautious of other vessels on her bow, with alertness toward turning to starboard toward the Nakanose Traffic Route, decelerated without knowing the existence of Vessel A and then turned to starboard. Officer B₁ , unaware of the call of Vessel B by Tokyo MARTIS and Pilot A on VHF 16 CH, continued to turn to starboard.	VTS Operator continued to call Vessel B on 16 CH to warn about Vessel A on her stern, but could not get any response. VTS Operator informed Vessel A that Vessel B , which was navigating on her bow, was proceeding toward anchorage K1.
04:22:32 ~	The port bow of Vessel A collided with the bow of Vessel B, and immediately after that, the starboard bow of Vessel A collided with the Buoy.		

4 CONCLUSIONS

4.1 Probable Causes

It is probable that in this accident, when both Vessel A and Vessel B were proceeding northwestward in the vicinity of the north exit of the Uruga Suido Traffic Route at night, Pilot A, thinking that he could safely overtake Vessel B even if he did not inform Vessel B of his intention to overtake on the starboard side by VHF, etc., continued to navigate in a manner to overtake Vessel B, and when Officer B₁ received information from Tokyo MARTIS that she was obliged to navigate the Nakanose Traffic Route, he turned to starboard toward the Nakanose Traffic Route without knowing the existence of Vessel A on the starboard quarter, so both vessels collided, and then the starboard bow of Vessel A collided with the Buoy.

It is probable that Pilot A thought that he could overtake Vessel B safely without informing Vessel B of his intention to overtake starboard side of Vessel B by VHF or other means because Vessel B, after proceeding toward the center of the Uruga Suido Traffic Route, did not turn to starboard toward Nakanose Traffic Route even after passing through the southwest of Daini Kaiho, and continued proceeding northwestward toward the north exit of the Uruga Suido Traffic Route.

It is probable that Officer B₁ turned to starboard toward Nakanose Traffic Route without knowing the existence of Vessel A on the starboard quarter because he thought that the speed

difference of vessels navigating the Uruga Suido Traffic Route with speed limitation was small and that Vessel B would not be overtaken, and when he received information from the Tokyo MARTIS to the effect that she was obliged to navigate the Nakanose Traffic Route, he thought it necessary to enter the Nakanose Traffic Route immediately because he thought it was an instruction, and thought that he would not be able to enter the Nakanose Traffic Route by turning in front of the Buoy on the starboard bow unless he turned to starboard immediately, and was proceeding paying attention to turning to starboard toward the Nakanose Traffic Route while paying attention to other vessels on her bow.

It is probable that the following factors contributed to the occurrence of the accident: Master B entrusted Officer B₁ with the bridge watch on Uruga Suido Traffic Route; Vessel B was on bridge watch by Officer B₁ while Master B and Officer B₁ did not properly share information necessary for navigation such as navigation plans; Officer B₁ communicated to Tokyo MARTIS the location different from the scheduled anchorage without knowing that the name of the scheduled anchorage was anchorage Y1, and continued the navigation without hearing the information concerning Vessel A provided by VHF from Tokyo MARTIS.

4.2 Other Findings of Safety-Related Issues

It is somewhat likely that if Officer B₁ had recognized that the provision of information to the vessel by the Tokyo MARTIS was intended to convey facts and circumstances observed for the purpose of assisting safe navigation and not to give instructions on maneuvering, he could have been able to navigate the vessel appropriately according to the situation at that time.

5 SAFETY ACTIONS

It is probable that in this accident, both Vessel A and Vessel B were proceeding northwestward in the vicinity of the north exit of the Uruga Suido Traffic Route at night, and both vessels collided with each other, because Pilot A thought that they could safely overtake Vessel B without informing Vessel B of the intention to overtake by VHF, etc., and continued to navigate in a manner to overtake Vessel B, and Officer B₁ thought that it was necessary to enter the Nakanose Traffic Route immediately because he thought that he had been instructed by the Tokyo MARTIS to provide information to the effect that Vessel B was obliged to navigate the Nakanose Traffic Route, and turned to the right toward the Nakanose Traffic Route without knowing the existence of Vessel A.

In addition, it is probable that the following factors contributed to the occurrence of the accident: Master B entrusted Officer B₁ with the bridge watch on Uruga Suido Traffic Route; Vessel B was on bridge watch by Officer B₁ while Master B and Officer B₁ did not properly share information necessary for navigation such as navigation plans; Officer B₁ communicated to Tokyo MARTIS the location different from the scheduled anchorage without knowing that the name of the scheduled anchorage was anchorage Y1, and continued the navigation without hearing the information concerning Vessel A provided by VHF from Tokyo MARTIS.

Furthermore, it is somewhat likely that if Officer B₁ had recognized that the provision of information to the vessel by the Tokyo MARTIS was intended to convey facts and circumstances observed for the purpose of assisting safe navigation and not to give instructions on maneuvering, he could have been able to navigate the vessel appropriately according to the situation at that time.

Therefore, it is necessary to implement the following measures to prevent the recurrence of similar accidents.

- (1) When masters or pilots intend to overtake another vessel in the same Traffic Route, they should identify the other vessel's movements, confirm the other vessel's maneuvering intentions at an early stage, and if they could not clarify the movements of the other vessel, or could not maintain a safe distance, they should not overtake the other vessel.
- (2) When pilots, bridge watch-keeping personnel, etc., are faced with a situation where there is a risk of another vessel approaching, they should keep in mind the possibility that the other vessel might not be aware of their own vessel, so they must inform about their presence and their maneuvering intention on the VHF or with a whistle, etc. at an early stage.
- (3) When navigating, Bridge watchkeeping personnel, should regularly conduct an adequate lookout of not only the vessel's bow side but also her stern side.
- (4) Owners and managers, etc., should actively support the master to establish an environment in which the master can securely go up to the bridge and command the vessel in narrow channel navigation, and the master should go up to the bridge and command the vessel in narrow channel navigation.
- (5) Master, bridge watch-keeping personnel, etc., should appropriately share information necessary for navigation such as navigation plans, etc., by providing navigation plans, etc., on the bridge, in which scheduled anchorages, ports of destination, etc., are recorded.
- (6) Bridge watchkeeping personnel, etc., should make the effort to collect the necessary information about the navigational plan before taking over the duty, and if they found out that they do not have the information while they are on duty, they clarify with the master after checking the safety of the vicinity, and when reporting information to Tokyo MARTIS, such as the notification of entry, should provide accurate information.
- (7) Bridge watchkeeping personnel, etc., should be familiar with the laws and regulations such as the Maritime Traffic Safety Act that stipulate the necessity for vessels 50 m or more to navigate between Line b and the mouth of Tokyo Bay to navigate Uraga Suido Traffic Route and Nakanose Traffic Route.
- (8) Bridge watchkeeping personnel, etc., when conducting VHF communications and intercepting communications related to their own vessel, should listen carefully until the communication is completed.
- (9) Masters and bridge watchkeeping personnel, etc., should recognize that the provision of information to vessels by the Tokyo MARTIS, etc. is intended to convey facts and situations observed for the purpose of assisting safe navigation, and not to give instructions on maneuvering, and should endeavor to ensure safe navigation by effectively utilizing this information.

5.1 Safety Actions Taken

5.1.1 Safety Actions Taken by Tokyo Bay Licensed PILOTS' Association

After this accident, as a safety measure to prevent the recurrence of similar accidents, Tokyo Bay Licensed PILOTS' Association made Pilot A took a ship maneuvering training on a ship maneuvering simulator under the conditions at the time of the accident and made the following matters known to the members.

- (1) Not overtaking another vessel until the other's vessel movements and safety can be confirmed.
- (2) When there is a risk of another vessel approaching, communicate on the VHF at an early stage to make sure of her maneuvering intention, and If necessary, give a whistle signal such

as an alert signal.

- (3) Avoid approaching other vessels in the vicinity of a Passage entrance or the point where a vessel is altering her course.

5.1.2 Safety Actions Taken by Company B₁ and Company B₂

After this accident, as a safety measure to prevent the recurrence of similar accidents, Company B₁ and Company B₂ instructed all the crew members to strictly conduct a lookout with their vision and the radar, they also would regularly conduct training based on this accident and retrained their crew members regarding the following issues.

- (1) Matters concerning laws and regulations such as the Maritime Traffic Safety Act
- (2) Matters concerning the sea area, etc. sea area where the captain should command as prescribed in the Safety Management Regulation.

5.2 Safety Actions Required

- (1) When masters intend to overtake another vessel in the same Traffic Route, they should identify the other vessel's movements, confirm the other vessel's maneuvering intentions at an early stage, and if they could not clarify the movements of the other vessel, or could not maintain a safe distance, they should not overtake the other vessel.
- (2) Owners and managers, etc., should actively support the master to establish an environment in which the master can securely go up to the bridge and command the vessel in narrow channel navigation, and the master should go up to the bridge and command the vessel in narrow channel navigation.
- (3) Master, bridge watch-keeping personnel, etc., should appropriately share information necessary for navigation such as navigation plans, etc., by providing navigation plans, etc., on the bridge, in which scheduled anchorages, ports of destination, etc., are recorded.
- (4) Bridge watchkeeping personnel, etc., should make the effort to collect the necessary information about the navigational plan before taking over the duty, and if they found out that they do not have the information while they are on duty, they clarify with the master after checking the safety of the vicinity, and when reporting information to Tokyo MARTIS, such as the notification of entry, should provide accurate information.
- (5) Bridge watchkeeping personnel, etc., when conducting VHF communications and intercepting communications related to their own vessel, should listen carefully until the communication is completed.
- (6) Masters and bridge watchkeeping personnel, etc., should recognize that the provision of information to vessels by the Tokyo MARTIS, etc. is intended to convey facts and situations observed for the purpose of assisting safe navigation, and not to give instructions on maneuvering, and should endeavor to ensure safe navigation by effectively utilizing this information.

The Japan Transport Safety Board, in order to contribute to the prevention of the recurrence of similar accidents based on the investigation results of this accident, requests the cooperation of the Japanese Shipowners' Association, the Japan Federation of Coastal Shipping Associations, the Japan Association of Foreign-trade Ship Agencies and the Japan Federation of Pilots' Associations in disseminating this report to the parties concerned.

Voice and Sound Record on S-VDR of Vessel A (Excerpt) and VHF Communications Records of Tokyo MARTIS (Excerpt)

*Voices in Japanese is translated into English and shown in italics.

Voice and Sound Record on S-VDR of Vessel A (Excerpt)			VHF Communications Records of Tokyo MARTIS			
Time (HH:MM:SS)	Speaker	Voice	Sender	Receiver	CH	Voice Messages Exchanged
02:32:00 ~02:35:00			Vessel B	Tokyo MARTIS	14	<i>We passed the Sunosaki line, proceeding to Kawasaki.</i>
			Tokyo MARTIS	Vessel B		<i>Have you decided on the anchorage location?</i>
			Vessel B	Tokyo MARTIS		<i>I don't know.</i>
			Tokyo MARTIS	Vessel B		<i>Please notify us again once you've settled (on the location).</i>
03:22:00 ~03:24:00			Vessel B	Tokyo MARTIS	16	<i>Called, responded, changed the frequency to 13 CH.</i>
			Tokyo MARTIS	Vessel B	13	<i>US line has been demolished. So will you be anchoring in the area near the wind tower?</i>
			Vessel B	Tokyo MARTIS		<i>I think we will be anchoring at the anchorage near Kawasaki.</i>
			Tokyo MARTIS	Vessel B		<i>Around anchorage K1?</i>
			Vessel B	Tokyo MARTIS		<i>Yes.</i>
			Tokyo MARTIS	Vessel B		<i>Understood.</i>
03:59:10 ~03:59:12	Able Seaman	Steady on 325° sir.				
	Pilot A	Thank you.				
04:13:18 ~04:13:26	Pilot A	I will overtake right side (of that vessel).				
	Master A	Right side.				

Voice and Sound Record on S-VDR of Vessel A (Excerpt)			VHF Communications Records of Tokyo MARTIS			
Time (HH:MM:SS)	Speaker	Voice	Sender	Receiver	CH	Voice Messages Exchanged
04:16:21 ~04:16:23	Pilot A	332.				
	Able Seaman	332.				
04:17:08 ~04:17:09	Able Seaman	Course on 332°				
	Pilot A	OK.				
04:19:15 ~04:19:30	Tokyo MARTIS	<i>Uraga Suido Traffic Route No.5,6, SHOUTOKUMARU, this is Tokyo MARTIS. Please change the frequency to 14 CH.</i>	Tokyo MARTIS	Vessel B	16	<i>Called, responded, changed the frequency to 14 CH.</i>
	Officer B ₁	<i>OK, Sir. 14.</i>				
04:19:33 ~04:20:20	Tokyo MARTIS	<i>Are you still going to anchorage K1 ? Over.</i>	Tokyo MARTIS	Vessel B	14	<i>Question. Are you still going to anchorage K1? Over.</i>
	Officer B ₁	<i>I heard that we will be anchoring at the entrance of Kawasaki.</i>	Vessel B	Tokyo MARTIS		<i>I heard that we will be anchoring at the entrance of Kawasaki.</i>
	Tokyo MARTIS	<i>Vessels proceeding to Kawasaki are obliged to pass Nakanose Traffic Route. Over.</i>	Tokyo MARTIS	Vessel B		<i>Information. Vessels proceeding to Kawasaki are obliged to pass Nakanose Traffic Route. Over.</i>
	Officer B ₁	<i>Do we have to pass through Nakanose if we're going to Kawasaki?</i>	Vessel B	Tokyo MARTIS		<i>Do we have to pass through Nakanose if we're going to Kawasaki?</i>
	Tokyo MARTIS	<i>There is an obligation to pass Nakanose Traffic Route.</i>	Tokyo MARTIS	Vessel B		<i>Information. There is an obligation to pass Nakanose Traffic Route.</i>
	Officer B ₁	<i>OK, Sir.</i>	Vessel B	Tokyo MARTIS		<i>OK, Sir. Then, we will turn from now.</i>
				Tokyo MARTIS		Vessel B

Highlighted in blue: Voice that was not recorded on Vessel A's S-VDR due to noise, CH change, etc.

Voice and Sound Record on S-VDR of Vessel A (Excerpt)			VHF Communications Records of Tokyo MARTIS			
Time (HH:MM:SS)	Speaker	Voice	Sender	Receiver	CH	Voice Messages Exchanged
04:20:27 ~04:21:35	Tokyo MARTIS	<i>APL PUSAN, CH 66, over.</i>	Tokyo MARTIS	Vessel A	16	<i>APL PUSAN, CH 66, over.</i>
	Pilot A	<i>Tokyo MARTIS, this is APL PUSAN, over.</i>	Vessel A	Tokyo MARTIS	66	<i>Tokyo MARTIS, this is APL PUSAN, over.</i>
	Tokyo MARTIS	<i>Information, now, there is a vessel navigating on your port bow on the same course without AIS, called SHOUTOKUMARU. According to the information from the vessel, she is going to anchorage K1, but now she is still proceeding northwestward. Pay attention to the movement of this vessel. If necessary, please make contact and navigate safely.</i>	Tokyo MARTIS	Vessel A		<i>Information, now, there is a vessel navigating on your port bow on the same course without AIS, called SHOUTOKUMARU. According to the information from the vessel, she is going to anchorage K1, but now she is still proceeding northwestward. Pay attention to the movement of this vessel. If necessary, please make contact and navigate safely.</i>
	Pilot A	<i>Understood. Thank you.</i>	Vessel A	Tokyo MARTIS		<i>Understood. Thank you.</i>
04:21:39 ~04:21:57	Pilot A	<i>SHOUTOKUMARU, SHOUTOKUMARU, this is APL PUSAN, over. SHOUTOKUMARU, SHOUTOKUMARU...</i>				
04:22:00 ~04:22:30	Master A	Whistle, whistle, whistle, whistle,				
	Pilot A	Stop engine.				
	Master A	Hard starboard, hard starboard, hard starboard.				
	Pilot A	Hard starboard, hard starboard,				
04:22:07 ~04:22:33	Whistle	(one long blast)	Tokyo MARTIS	Vessel B	16	<i>SHOUTOKUMARU, please maintain a safe distance, pay attention to behind you.</i>
		(04:22:32 Sound of impact)				