

MA2014-8

**MARINE ACCIDENT
INVESTIGATION REPORT**

August 29, 2014



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

Norihiro Goto
Chairman,
Japan Transport Safety Board

Note:

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

MARINE ACCIDENT INVESTIGATION REPORT

Vessel type and name: Container ship BAI CHAY BRIDGE

IMO number: 9463346

Gross tonnage: 44,234 tons

Vessel type and name: Fishing vessel SEIHOU MARU No. 18

Fishing vessel registration number: KO2-6268

Gross tonnage: 18 tons

Accident type: Collision

Date and time: At around 23:12 (JST) on January 23, 2013

Location: On a true bearing of approximately 116° and at a distance of 11.4 nautical miles from the Katsuura Lighthouse, Katsuura City, Chiba Prefecture
(Approximately 35°03.3'N 140°31.6'E)

August 7, 2014

Adopted by the Japan Transport Safety Board

Chairman Norihiro Goto

Member Tetuo Yokoyama

Member Kuniaki Syouji

Member Toshiyuki Ishikawa

Member Mina Nemoto

SYNOPSIS

< Summary of the Accident >

On January 23, 2013, the container ship BAI CHAY BRIDGE with the master, third officer and 21 other crewmembers on board was proceeding southwestward to Keihin Port, and the fishing vessel SEIHOU MARU No. 18 with the skipper and five other crewmembers on board was proceeding north-northeastward to Choshi Port. At around 23:12, the two vessels collided with each other east-southeast off Katsuura Port in Katsuura City, Chiba Prefecture.

All crewmembers on the SEIHOU MARU No. 18, four of whom were slightly injured, were rescued by the BAI CHAY BRIDGE, and the fishing vessel broke apart at around the middle of the hull.

No one on the BAI CHAY BRIDGE was injured or killed, and the vessel sustained scratches on the bow.

< Probable Causes >

It is probable that in this accident, while the BAI CHAY BRIDGE was proceeding southwestward and the SEIHOU MARU No.18 north-northeastward, east-southeast off Katsuura Port during nighttime, the third officer of the BAI CHAY BRIDGE was not keeping a proper look-out on the radar, while the skipper of the SEIHOU MARU No. 18 was not properly monitoring the maneuvers of the BAI CHAY BRIDGE and, thinking that there was a risk of collision with the BAI CHAY

BRIDGE, turned the rudder to starboard, resulting in a collision.

It is probable that the third officer of the BAI CHAY BRIDGE was not keeping a proper look-out on the radar because he was chatting with the helmsman and listening to communications between other vessels.

It is probable that the skipper of the SEIHOU MARU No. 18 was not properly monitoring the maneuvers of the BAI CHAY BRIDGE because instead of using the radar cursor or other means to monitor changes in the BAI CHAY BRIDGE's bearing, he just kept a look-out by sight for the BAI CHAY BRIDGE even though its navigation lights were difficult to see.

It is probable that the skipper of the SEIHOU MARU No. 18 had the rudder turned to starboard, thinking that there was a risk of collision with the BAI CHAY BRIDGE, because he believed that passing port-to-port was the norm.

1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

On January 23, 2013, the container ship BAI CHAY BRIDGE with the master, third officer and 21 other crewmembers on board was proceeding southwestward to Keihin Port, and the fishing vessel SEIHOU MARU No. 18 with the skipper and five other crewmembers on board was proceeding north-northeastward to Choshi Port. At around 23:12, the two vessels collided with each other east-southeast off Katsuura Port in Katsuura City, Chiba Prefecture.

All crewmembers on the SEIHOU MARU No. 18, four of whom were slightly injured, were rescued by the BAI CHAY BRIDGE, and the fishing vessel broke apart at around the middle of the hull and sank.

No one on the BAI CHAY BRIDGE was injured or killed, and the vessel sustained scratches on the bow.

1.2 Outline of the Accident Investigation

1.2.1 Setup of the Investigation

On January 24, 2013, the Japan Transport Safety Board appointed an investigator-in-charge and four other marine accident investigators to investigate this accident.

1.2.2 Collection of Evidence

January 24, 2013: On-site investigation and interviews

January 25, 29 and 30, 2013: Interviews with Umazume Shipyard staff

April 2, 9, 19, 25, May 28 and August 1, 2013: Collection of written responses to questionnaires

1.2.3 Comments from Parties Relevant to the Cause of the Accident

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

1.2.4 Comments from the Flag State

Comments on the draft report were invited from the flag state of the BAI CHAY BRIDGE.

2 FACTUAL INFORMATION

2.1 Events Leading to the Accident

2.1.1 Navigational Conditions Based on the Records of the Voyage Data Recorder (VDR)

(1) Verbal Communication on the Bridge

The main verbal communication that took place on the bridge of the BAI CHAY BRIDGE (hereafter referred to as “Vessel A”) between around 22:58:19 and around 23:12:44 on January 23, 2013, as recorded by the vessel’s voyage data recorder^{*1} (hereafter referred to as “VDR”), was as follows.

Please note that either Tagalog or English was spoken during this communication. Tagalog is indicated with a bracketed “T” and English with a bracketed “E.”

Time	Main verbal communication
Around 22:58:19	Tingnan mo yung iyak ni, John tsaka yung iyak kaya nya sa mga pelikula iyak nila pulang-pula ang mata. (T) (Look how John is crying. That’s exactly the way he cries in movies. His eyes are so red.) (Third officer)
Around 22:58:35	Parang pinipigilan pa kunwari (T) (He seems to be holding back tears.) (Third officer)
Around 22:58:38	Umaarte pa dyan si Anne Curtis, umaarte pa (T) (He acts like Anne Curtis.) (Helmsman)
Around 22:58:53	Ganda daw si Kaye (T) (Kaye is beautiful, isn’t she?) (Helmsman)
Around 22:59:04	Umiiyak din (T) (She is crying.) (Helmsman)
Around 23:10:39	Ano, yan? (T) (What’s that? What’s that?) (Helmsman)
Around 23:10:41	Hah! (T) (What?) (Third officer)
Around 23:10:42	Alin? (T) (Where is it?) (Third officer)
Around 23:11:17	Hindi ko makita yung sinabi mo (T) (I can’t see what you’re talking about.) (Third officer)
Around 23:11:34	Starboard 15 (E) (Third officer)
Around 23:11:36	Starboard 15 (E) (Helmsman)
Around 23:11:53	Starboard yun (T) (It’s on the starboard side.) (Helmsman)
Around 23:11:55	Hah! (T) (What?) (Third officer)
Around 23:12:00	3rd, 3rd Starboard 15 (E) (Helmsman)
Around 23:12:01	Thank you. (E) (Third officer)
Around 23:12:08–28	(Sound of whistle), (Sound of daylight signaling light)
Around 23:12:10	Hard (E) (Third officer)
Around 23:12:17	Hard Starboard Sir (E) (Helmsman)
Around 23:12:18	Hard Starboard (E) (Third officer)
Around 23:12:24	Naka starboard na yan? (T) (put rudder hard to starboard?) (Third officer)
Around 23:12:25	Naka starboard to (T) (Yes, sir.) (Helmsman)

^{*1} The voyage data recorder (VDR) records and stores information such as the vessel’s location, course, speed and radar data, as well as VHF radiotelephone communications and sounds on the bridge.

Around 23:12:30	Ano bang gagawin ko? (T) (What should I do?)	(Third officer)
Around 23:12:33	Mag hard port ka na (T) (Hard port.)	(Helmsman)
Around 23:12:34	Nabangba na (T) (We hit it.)	(Helmsman)
Around 23:12:34	Hah! (T) (Aah!)	(Third officer)
Around 23:12:35	Nabangba (T) (We hit it.)	(Helmsman)
Around 23:12:44	O-o (T) (Yeah)	(Third officer)

(2) Voice Records of the VHF Radiotelephone

According to the VDR voice recordings from Vessel A, the VHF radiotelephone was switched from Channel 16 to Channel 69 at around 23:03:06 for communications between other vessels. Communications continued even after the occurrence of this accident.

(3) Navigational Conditions of Vessel A and Location of the SEIHOU MARU No. 18 Based on Radar Information

Based on the radar records of Vessel A's VDR, the navigational conditions of Vessel A and the bearing and distance of the SEIHOU MARU No. 18 (hereafter referred to as "Vessel B") as seen from Vessel A (as measured at its antenna) from around 22:58:12 to around 23:12:27 can be summarized as follows.

Please note that the S-BAND radar^{*2} (hereafter referred to as the "No. 1 Radar") near the center of the bridge, a component of the radar information system of Vessel A's VDR, had been set to the 12 mile (M) range in the North Up^{*3} and Off Center^{*4} modes until around 23:11:27 at which point it was switched to the 6 M range.

Time (hh:mm:ss)	Latitude (°- ')	Longitude (°- ')	Heading (°)	COG (°)	SOG (kn)	Vessel B's approx. bearing (°)	Approx. distance to Vessel B (M)
22:32:28	35-10.733	140-41.948	225.0	227.3	16.8	-	-
22:58:12	35-05.900	140-35.418	228.1	229.2	16.7	227.0	5.7
23:00:12	35-05.541	140-34.896	228.0	230.7	16.8	227.5	4.8
23:02:12	35-05.178	140-34.377	227.5	229.9	16.7	229.0	4.0
23:04:12	35-04.820	140-33.854	228.7	231.2	16.6	230.8	3.2
23:06:12	35-04.464	140-33.335	227.8	229.2	16.7	236.0	2.4
23:07:12	35-04.278	140-33.067	227.7	229.3	17.0	238.3	2.0
23:08:12	35-04.094	140-32.806	227.9	228.8	17.0	243.0	1.6
23:09:12	35-03.915	140-32.545	228.5	230.8	17.0	246.5	1.1

^{*2} An S-BAND radar operates on S-band microwaves of 3 GHz with a relatively long wavelength of 10 cm, characterized by small radio wave attenuation and low sea-surface and raindrop reflectance.

^{*3} In the North Up mode, the top of the radar screen is always true north. When a vessel changes its course, only the heading flash follows, while the echoes of other vessels, shores and breakwaters, etc., do not move.

^{*4} In the Off Center mode, the position of the vessel on the radar screen moves in the direction opposite to its course, thus securing a wide space ahead of the vessel for monitoring.

23:10:12	35-03.734	140-32.277	228.7	230.3	16.9	248.5	0.7
23:10:42	35-03.641	140-32.138	227.9	230.4	17.1	249.0	0.6
23:10:57	35-03.596	140-32.071	227.4	230.3	17.1	246.5	0.5
23:11:12	35-03.551	140-32.005	227.6	230.0	16.9	246.0	0.4
23:11:27	35-03.504	140-31.939	227.3	229.8	17.1	246.5	0.3
23:11:42	35-03.458	140-31.873	227.0	230.2	17.1	245.0	0.2
23:12:12	35-03.367	140-31.750	236.6	227.9	16.5	236.6	0.1
23:12:27	35-03.321	140-31.682	247.6	231.5	15.7	N/A	N/A

(4) Echo of Vessel B

Radar information from Vessel A's VDR shows the following.

The echo of Vessel B appeared on the radar screen at around 22:58 and stayed there.

(See Photo 2.1-1.)

(5) Radar Trails of Vessel B

Radar information from Vessel A's VDR shows the following radar trails^{*5} of Vessel B.

1. The radar trails are Vessel B's true headings.
2. The radar trails were displayed starting at around 22:58:12, showing Vessel B at about 5.7 M from Vessel A. (See Photo 2.1-1.)

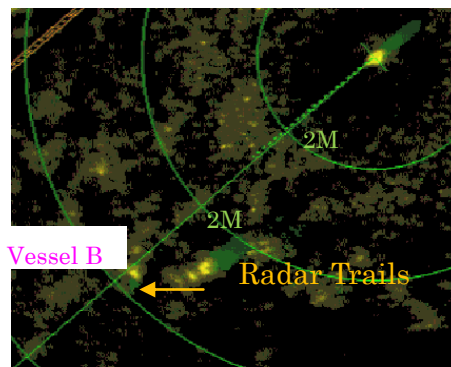


Photo 2.1-1 Echo and Radar Trails of Vessel B

3. The radar trails were displayed on the screen in the direction of about 023° (true bearing; hereafter the same) from around 23:02:12 to around 23:08:12.
4. The radar trails were displayed on the screen in the direction of about 090° from around 23:08:12 to around 23:10:57.
5. The radar trails were displayed on the screen in the direction of about 155° from around 23:10:57 to around 23:12:12.

^{*5} Radar trails show the path of a target in the form of an afterglow.

2.1.2 Navigational Conditions According to the Statements of Crewmembers

(1) Vessel A

According to the statements of the master (hereafter referred to as “Master A”), the chief officer (hereafter referred to as “Officer A₁”), the third officer (hereafter referred to as “Officer A₃”) and the helmsman (hereafter referred to as “Helmsman A₃”), the navigational conditions of Vessel A were as follows.

With Master A, Officer A₃ and 21 other crewmembers on board and loaded with a cargo of 3,033 TEU^{*6} (21,319.6 tons), Vessel A left Oakland Port in California, the United States of America, for Keihin Port, Japan at around 09:20 (local time) on January 9, 2013.

At around 19:45 on January 23, Officer A₃ went to the bridge to assume navigational watch where he met Master A, Officer A₁ and the helmsman who were handing over the watch to Officer A₃ and Helmsman A₃.

At around 20:00, on a course at about 220°, navigational watch was handed over to Officer A₃ and Helmsman A₃ from their predecessors.

Upon assuming the watch, Officer A₃ engaged the autopilot and used two radars and other equipment. It was cloudy at that time, with a sea state of 6 (wave height of 4–6 m), easterly winds and a wind force of 6 (10.8–13.8 m/s).

At around 20:30, Master A ordered Officer A₃ to set the course to 215° to steer the ship away from sunken vessels and small islands near the shores.

At around 20:50, Master A left the bridge after writing down his orders in the night order book.

At around 22:30, while sailing east of Katsuura Port, Officer A₃ changed the course over ground so that the ship would head for 228°. At around that time, it started to rain.

Officer A₃ took his post near the No. 1 Radar and Helmsman A₃ near the X-BAND radar^{*7} (hereafter referred to as “the No. 2 Radar”) on the starboard side of the bridge for navigational watch.

At around 23:00, Officer A₃ had changed the course to 228°. At around 23:05, Officer A₃ sighted Vessel B, on which no lights were illuminated, at a distance of about 1 M on the starboard bow. As he could not identify the vessel on the No. 1 Radar, Officer A₃ switched the radar range from 12 M to 6 M and kept a look-out carefully. At around 23:10, with Vessel B at a distance of about 0.3–0.5 M, Officer A₃ determined that it was a fishing vessel and that it was crossing ahead of the bow of Vessel A to the port side while showing its port side light. Officer A₃ then ordered Helmsman A₃ to turn the rudder 15° to starboard, blew the whistle, gave warning with the daylight signaling lights and ordered Helmsman A₃ to put the rudder hard to starboard. Soon after that, the bow of Vessel A collided with Vessel B.

^{*6} TEU is used to indicate the loading capacity of a container ship, with 1 TEU meaning that the ship is capable of carrying one 20-foot container.

^{*7} An X-BAND radar operates with X-band microwaves of 9 GHz with a short wavelength of 3 cm, characterized by directional radio wave emission, ease of capturing reflected waves from targets and high sea-surface and raindrop reflectance.

(2) Vessel B

According to the statements of the skipper (hereafter referred to as “Skipper B”), who was also the chief fisherman, and two trainees (hereafter referred to as “Trainee B₁” and “Trainee B₂”), the navigational conditions of Vessel B were as follows.

Vessel B, with Skipper B and five other crewmembers on board, left Choshi Port for fishing grounds near the Ogasawara Islands, Ogasawara, Tokyo, for tuna longline fishing at around 09:00 on January 6, 2013.

After arriving at the fishing grounds on January 7, Vessel B started operations and while moving south, carried out a total of 12 sessions until January 21. At around 00:00 on January 22, Vessel B left the fishing grounds for Choshi Port with the course set to about 010° and at a speed (over ground; hereafter the same) of about 8.5 kn.

Skipper B kept navigational watch from when Vessel B left the fishing grounds until about 08:00. After that, other crewmembers took turns keeping watch for two hours each. All crewmembers off watch rested in the crew cabin.

At around 21:00 on January 23, Vessel B passed between Miyakejima Island and Mikurajima Island, both in Tokyo, and kept sailing with the course set to about 025° and at a speed of about 8.3 kn.

At around 22:30, as the vessel was nearing land and the traffic was becoming heavier, Skipper B went to the upper bridge to take over from Trainee B₁ who was on navigational watch. Trainee B₁ stayed with Skipper B on the watch until about 23:00

Skipper B kept a look-out while sitting in a chair at the rear of the bridge on the starboard side with the autopilot engaged, occasionally scanning the radar at the front of the bridge on the port side and watching outside through a pair of binoculars as the vessel sailed on a course at about 025° and a speed of about 8.0 kn.

At around 22:58, while the vessel was proceeding north-northeast, east-southeast off Katsuura Port, Skipper B spotted the echo of Vessel A on the 3M-range screen of the radar, which was in the Head Up^{*8}/Off Center mode and showed Vessel A at around 20° at a distance of about 4.0 M on the starboard bow. As he also briefly sighted lights, Skipper B continued a look-out by sight and radar scanning. At that time, Skipper B did not use the cursor on the radar.

At around 23:00, Trainee B₂ was relieved by Trainee B₁, and was waiting on the lower bridge to take over from Skipper B.

At around 23:07, when the distance from Vessel A narrowed to about 2 M, Skipper B sighted the starboard side light of Vessel A on the starboard bow although he could not see the masthead light. As Vessel A’s bearing did not change, Skipper B thought that there was a risk of collision. Based on his experience in which larger vessels did not change their course in situations like this, Skipper B decided to avoid a possible collision by changing course as he had always done in the past. As he believed that passing port-to-port was the norm, Skipper B thought that Vessel A would understand his intention and take appropriate actions for port-to-port passing if Vessel B turned the rudder to starboard away from the shore and showed the port

^{*8} In the Head Up mode, the top of the radar screen corresponds to the heading of the vessel (i.e., relative bearing indication).

side light. Therefore, at around 23:08, Skipper B turned the rudder about 15° to starboard and set the course to about 090°.

After setting the course to about 090°, Skipper B noticed that the bearing of Vessel A changed slightly toward the bow of Vessel B. However, Skipper B felt that both vessels would collide as he saw Vessel A nearing and its starboard side light coming closer to the port side. At around 23:11, Skipper B turned the rudder to starboard, setting the course to about 180°. At around 23:12–13, no sooner had the whistle of Vessel A been sounded than the port middle side of Vessel B collided with Vessel A.

2.1.3 Events Following the Collision

(1) Vessel A

According to the statements of Master A, Officer A₁, the second officer of Vessel A, Officer A₃ and Helmsman A₃, the following events took place after the collision.

Officer A₃ saw Vessel B disappear and felt an impact at the bow similar to waves hitting the bow. At around 23:13, as he felt that it might be a collision, Officer A₃ contacted Master A over the inboard phone.

Master A immediately went to the bridge and had Officer A₃ explain the situation before taking over the con of the vessel.

When he took over the con of the vessel, Master A still could not find Vessel B. Therefore, Master A ordered Officer A₃ to summon Officer A₁ and the other crewmembers to find Vessel B and its crewmembers using the searchlights on both wings. Then, Master A had Vessel A sail northeast away from the estimated collision point while being careful not to harm the crewmembers of Vessel B. While Vessel A was then sailing southwest and northwest near the estimated collision point at reduced speed, Master A saw red rescue signals and ordered Officer A₁ to engage in rescue operation. Master A then went down to observe the operation.

At around 00:03 on January 24, Officer A₁ reported the collision with Vessel B, the location of the collision and other relevant information to the 3rd Regional Coast Guard Headquarters Command Operation Center (hereafter referred to as the “3rd Regional Command Operation Center”) over the VHF radio telephone and asked for instructions. In addition, Officer A₁ reported the accident to the management company over the satellite telephone.

At around 00:15, Master A and other crewmembers of Vessel A discovered the bow of Vessel B floating upside down and crewmembers of Vessel B on an inflatable life raft (hereafter referred to as the “Life Raft”). Officer A₁ updated the 3rd Regional Command Operation Center on the situation including that crewmembers of Vessel B were on the Life Raft.

Having thought that Vessel A’s lifeboats could not be used in the current wind and waves, Master A ordered that the Life Raft be approached and brought alongside of Vessel A. Vessel A then approached the Life Raft.

As the Life Raft was connected to the overturned stern of Vessel B with a mooring rope, crewmembers of Vessel A cut the rope and pulled the Life Raft toward Vessel A.

Crewmembers of Vessel A rescued the crewmembers of Vessel B one by one via a

ladder installed on the starboard bow, and provided them with blankets, dry clothes, food, drink, etc., and the use of the showers as needed.

At around 01:05, the rescue operation of all Vessel B's crewmembers was completed and the 3rd Regional Command Operation Center was informed of the completion.

Vessel A stayed adrift while waiting for a patrol boat to arrive so that the crewmembers of Vessel B could be transferred to the boat. At around 01:55, however, Vessel A was contacted by the 3rd Regional Command Operation Center and was told that a patrol boat had arrived near the area of the accident but that the transfer of the crewmembers was not possible due to the rough sea conditions. Vessel A then decided to transport the crewmembers to Keihin Port, the port of destination.

At around 03:53, Vessel A started sailing for Keihin Port. At around 10:20, Vessel A berthed at the Ohi Container Terminal of Keihin Port.

(2) Vessel B

According to the statements of Skipper B, the chief engineer of Vessel B (hereafter referred to as "Chief Engineer B"), a deckhand of Vessel B (hereafter referred to as "Deckhand B"), Trainee B₁, Trainee B₂ and another trainee (hereafter referred to as "Trainee B₃"), the following events took place after the collision.

When Vessel B collided with Vessel A, its bridge and crew cabin were flooded and her electric power was lost.

As the bridge was flooded, Trainee B₂, who was on the lower bridge, climbed to the upper bridge and escaped with Skipper B through the stern door and headed for the rear of the superstructure deck.

The sound of the impact and flooding awakened Deckhand B, Trainee B₁ and Trainee B₃, who had been asleep in the crew space. They immediately escaped to the upper deck and headed for the superstructure deck.

Deckhand B went to the superstructure deck and looked for the bow, which had been cut away and could not be found.

Chief Engineer B was in the galley at the stern after switching the fuel oil source to another tank, when he felt the impact of the collision and went out to the rear of the superstructure deck where he looked for the bow, which, however, was missing.

Having noticed that the bow side of the stern had slowly started sinking, Skipper B ordered the crewmembers to escape to the stern side and release the fenders and other floatable parts, when the Lift Raft deployed on the port stern. Skipper B then ordered all crewmembers to board the raft.

Skipper B went to the storeroom below the upper deck at the bow, picked up two blue squid-lure lamps and then climbed onto the upper deck, thinking that these lamps would help draw attention.

Trainee B₃ and Deckhand B were the first to reach the Life Raft by jumping onto it. They then pulled Trainee B₁ and Trainee B₂, who had jumped off the vessel and swam to them, up and onto the Life Raft. Then onto the Life Raft came Chief Engineer B and, last of all the crewmembers, Skipper B carrying a blue squid-lure lamp.

At that time, the Life Raft was still connected to the stern of Vessel B.

The three trainees took turns waving the blue squid-lure lamp. Chief Engineer B

put up a roof over the Life Raft. Skipper B took out a red flare from a bag of fittings and ignited it. All waited for rescue.

After a while, the Life Raft was found by Vessel A. The crewmembers of Vessel B were rescued via a ladder on Vessel A's starboard bow and were provided with blankets, dry clothes, drinks, etc.

The accident occurred at around 23:12 on January 23, 2013, approximately 116°, 11.4 M from the Katsuura Lighthouse at Katsuura City.

(See Figure 1: Estimated Navigation Routes; Figure 2: General Arrangement of Vessel A; Figure 3: General Arrangement of Vessel B; Figure 4: VTA Analysis; Table 1: VDR Voice Recordings; Photo 1: Vessel A; Photo 2: Vessel B; Photo 3: Radar Information from Vessel A's VDR; Photo 4: Damage to Vessel A's Starboard Side; Photo 5: Damage to Vessel A's Port Side; Photo 6: Vessel B Left Adrift – Around 13:30, January 24, 2013.)

2.2 Injuries to Persons

The statements of and medical attestations for Skipper B, Deckhand B, Trainee B₁, Trainee B₂ and Master A indicate the following.

(1) Vessel A

There were no injuries or deaths.

(2) Vessel B

After arriving at Keihin Port on Vessel A, Skipper B, Deckhand B, Trainee B₁ and Trainee B₂ were taken to a hospital for medical examination.

All were diagnosed as needing two weeks to recover completely: Skipper B, Deckhand B and Trainee B₁ from head injury and abrasion; and Trainee B₂ from right lower leg contusion, left lower limb bruise and left leg joint contusion.

2.3 Damage to Vessels

(1) Vessel A

The statements of Master A and the photographs showing damage to Vessel A indicate that Vessel A sustained scratches to its bow.

(2) Vessel B

Based on the statements of Skipper B and the photograph showing it drifting, Vessel B is thought to have broken apart at around the middle of the hull. As Vessel B was subsequently left adrift before sinking, details of the damage caused in the collision could not be ascertained.

(See Photo 4: Damage to Vessel A's Starboard Side; Photo 5: Damage to Vessel A's Port Side; Photo 6: Vessel B Left Adrift – Around 13:30, January 24, 2013.)

2.4 Crew Information

(1) Gender, Age, and Certificate of Competence

1. Master A: Male, 42 years old

Nationality: The Republic of the Philippines

Endorsement attesting the recognition of certificate under STCW Regulation I/10: Master (issued by the Republic of Panama)

Date of issue: March 5, 2010 (valid until February 17, 2015)

2. Officer A₃: Male, 24 years old

Nationality: The Republic of the Philippines

Endorsement attesting the recognition of certificate under STCW Regulation I/10: Second Officer (issued by the Republic of Panama)

Date of issue: September 16, 2011 (valid until October 6, 2015)

3. Helmsman A₃: Male, 28 years old

Nationality: The Republic of the Philippines

Certificate: Deck Watchkeeper

4. Skipper B: Male, 44 years old

Certificate: First Class Boat Operator, Personal Watercraft Operator, with Passenger Service License

Date of issue: August 11, 1998

Date of revalidation: August 5, 2008 (valid until August 10, 2013)

Sixth Grade Maritime Officer (Engineering)

Date of issue: July 8, 2009

Date of revalidation: July 8, 2009 (valid until July 7, 2014)

(2) Major Seagoing Experience

The statements of Master A, Officer A₃, Helmsman A₃ and Skipper B indicate the following.

1. Master A

Master A had been serving as a chief officer and master on vessels managed by Temm Maritime Co., Ltd. (hereafter referred to as "Company A") since October 2005. Master A was assigned to Vessel A in October 2012, serving as the master three times before the accident.

2. Officer A₃

Officer A₃ attended a maritime school in Japan between October and December 2008. He gained hands-on experience on training vessels and ocean-going tankers between December 2008 and December 2009. In July 2010, he completed a BS Marine Transportation course at a school in Iloilo. He then received training courses including on vessel simulation and bridge teamwork. From October 2010, he served as a junior third officer on cargo ships for about six months. From September 2011, he served as a third officer on cargo ships for about four months. He was assigned to Vessel A as a third officer in April 2012.

Officer A₃ had experienced six voyages from Oakland Port to Keihin Port on Vessel A before the accident.

He was in good health at the time of the accident.

3. Helmsman A₃

He had served as a helmsman on Vessel A twice before the accident. The latest series of voyages during which the accident occurred started in June 2012.

He had about four years of seagoing experience.

He was in good health at the time of the accident.

4. Skipper B

Skipper B started boarding Vessel B around 1996, becoming the skipper around 1998. He was in good health at the time of the accident. Details beyond this could not be ascertained due to the unavailability of cooperation from Skipper B.

2.5 Vessel Information

2.5.1 Particulars of Vessels

(1) Vessel A

IMO number:	9463346
Port of registry:	The Republic of Panama
Owner:	NANA MARINE INC. (The Republic of Panama)
Management company:	Company A
Classification society:	NIPPON KAIJI KYOKAI (Class NK)
Gross tonnage:	44,234 tons
L × B × D:	266.65 × 35.40 × 16.80 m
Hull material:	Steel
Engine:	One diesel
Output:	33,720 kW
Propulsion:	Single fixed-pitch propeller
Date of launch:	June 10, 2011

(2) Vessel B

Fishing vessel registration number:	KO2-6268
Inspection number:	282-15578
Base port:	Muroto City, Kochi Prefecture
Owner:	Privately owned
Gross tonnage:	18 tons
LR × B × D:	14.93 × 4.33 × 2.07 m
Hull material:	FRP (fiber reinforced plastic)
Engine:	One diesel
Output:	610 kW
Propulsion:	Single fixed-pitch propeller
Date of launch:	December 1994

2.5.2 Loading Conditions

The statements of Officer A₃ and Skipper B indicate the following.

(1) Vessel A

At the time of the accident, Vessel A was loaded with cargo of 3,033 TEU (21,319.6 tons) and the draught was about 9.47 m at the bow and about 9.82 m at the stern.

(2) Vessel B

At the time of the accident, Vessel B was carrying about 12 tons of raw tuna in seven of its nine holds and the upper and superstructure decks at the stern were loaded with nets, floats and other items.

2.5.3 Equipment and Instruments onboard

(1) Vessel A

The statements of Master A, Officer A₃ and Skipper B indicate the following.

1. On the bridge, the steering stand was located in the center while a gyro repeater and two VHF radiotelephones were located in front of the steering stand. Two radar consoles and other equipment were located on the right and engine controls and other items on the left side of the steering stand. Located at the rear of the bridge were a satellite navigation system (GPS), a satellite communication device and other items. At the time of the accident, the two radars and other items were in operation and there were no problems or failures with the hull, the engine or other equipment.
2. Inspection of Vessel A's navigation lights by the Japan Coast Guard upon arrival at Keihin Port found no problems.
3. The distance from the front end of the bridge wings to the bow measured 195.12 m. The distance from the wings to the stern measured 71.53 m. The GPS antenna was located on the starboard bow side of the compass deck and was about 193.5 m from the bow.

(2) Vessel B

The statements of Skipper B, Chief Engineer B and the three trainees indicate the following.

1. On the left side on the upper bridge, a series of devices had been installed: from the front, they were a radar console, a GPS plotter, two MF/HFSSB radiotelephones and a 27MHz SSB radiotelephone. On the rear right side on the bridge were chairs. The lower bridge was equipped with a radar console, a steering stand and other equipment. The Life Raft had been positioned in the middle of the hull on the port side. Details beyond this could not be ascertained due to the unavailability of cooperation from the owner of Vessel B (hereafter referred to as "Vessel Owner B") and Skipper B.

No problems or failures were found with the hull, the engine or other equipment.

2. During the navigational watch (17:00–19:00, 19:00–21:00 and 22:30 onward), Chief Engineer B, Deckhand B and Skipper B saw the illumination of the masthead and side lights reflected off the pipes and other objects.

2.5.4 Maneuverability of the Vessels

(1) Vessel A

The maneuverability table for Vessel A indicates the following.

1. Speed (loaded)

Item	Main engine (rpm)	Speed through water (kn)
Navigation full speed	93.7	22.72
Full speed	58	14.45
Half speed	48	11.74
Slow speed	38	9.21
Dead slow speed	28	7.34

2. Turning characteristics (loaded)

	Turning to starboard		Turning to port	
	Advance	Tactical diameter	Advance	Tactical diameter
Navigation full speed (21.5 kn)	778 m	833 m	759 m	778 m
Half speed (11.7 kn)	741 m	852 m	722 m	778 m

(2) Vessel B

Vessel B's maneuverability could not be ascertained due to the unavailability of cooperation from Vessel Owner B and other relevant quarters.

2.6 Weather and Sea Conditions

2.6.1 Weather Observation Data and Marine Warnings

(1) Local Marine Forecast

According to the Japan Meteorological Agency, the marine forecasts released on January 23 for the Kanto Sea Area and the northern sea off the Kanto Sea Area were as follows.

1. Forecast for Kanto Sea Area released at 18:30

Warning

Strong northeasterly wind with maximum velocity of 30 kn (around 15 m/s)

2. Forecast for the northern sea off the Kanto Sea Area released at 19:00

Wind direction: NE 30 kn (about 15 m/s), later SW 25 kn (about 13 m/s); Weather: cloudy partly rain, later occasionally fine; Visibility: 1–3 M, later 5 M; Wave height: 4 m, later 3 m

(2) Observation Data

Weather data observed by the Katsuura Special Regional Meteorological Station located around 12 M west-northwest of the site of the accident was as follows.

January 23, 2013

23:00 Wind direction: NNW, Wind speed: 5.9 m/s, Weather: rain,
Visibility: 17.0 km, Precipitation: 0.0 mm

23:10 Wind direction: NNW, Wind speed: 5.9 m/s, Precipitation: 0.5 mm

23:20 Wind direction: NNW, Wind speed: 5.4 m/s, Precipitation: 0.5 mm

2.6.2 Observation by the Crew and Others

(1) According to the radar information from Vessel A's VDR, there were north-northwesterly winds with a speed of around 8.1 m/s near the site of the accident at around 23:12:27 on January 23.

(2) According to the statements of Master A and Officer A₃, the weather at the time of the accident was as follows.

Weather: rain, Wind direction: ENE, Wind speed: 10.8–13.8 m/s, Wave height: 2–3 m, Temperature: 10°C

(3) According to the data provided by the Japan Coast Guard, the weather near the site of the accident at around 01:55 on January 24 was as follows.

Wind direction: NNW, Wind speed: 12 m/s, Wave height: 2.5 m, Weather: fine

2.7 Characteristics of the Area

From Off Su-no-Saki to Off Inubo Saki

The Sailing Directions for South and East Coasts of Honshu (March 2011) issued by the Japan Coast Guard includes the following descriptions.

(1) General information

The track between off Su-no-Saki and Inubo Saki include a fair number of course changes, while the route between Inubo Saki and Shiriya Saki is a simple one. Strict caution should be exercised in the vicinity of major points for altering courses, with heavy traffic and high density of fishing vessels.

(2) Fog season

Su-no-Saki to Inubo Saki; May to Aug. There is relatively little fog in the S part of Boso Hanto, but it occurs slightly more frequently around Inubo Saki. The peak season is July; fog occurs on an average of about 11 days in July at Choshi. According to data collected at the Inubo Saki Lighthouse, fog occurs frequently from 05:00 to 07:00, and less frequently from 13:00 to 17:00.

(3) Ocean currents

The Kuroshio is dominant in waters more than 30–40 M from the shore between Nojima Saki and Inobo Saki, where it flows to the NE at 1–4 kn. Along the coast S of Katsuura, the Kuroshio may come close to the shore resulting in a strong current flowing NE - E in this area. Along the coast N of Katsuura, the direction is variable, and rates of more than 1 kn are rare.

(4) Fishery

Operations with 200–300 fishing boats are carried out in a sea area of the E about 12M to the S about 13M, the east from Katsuura off about 2 M from October through the following June.

It should be noted that many fishing grounds are scattered off Inubo Saki, and fishing takes place throughout the year.

2.8 Operations and Other Management of the Vessels

2.8.1 Operations

(1) Vessel A

The statement of Master A and the written responses to the questionnaire by Company A indicate the following.

Vessel A was a liner making its round of port calls, which normally took about 42 days and included Xiamen Port in Xiamen, Fujian, Hong Kong Port and Yantian Port in Shenzhen, Guangdong, all in the People's Republic of China, Long Beach Port and Oakland Port, both in California, the United States of America, Keihin Port, Nagoya Port, Shanghai Port and back to Xiamen Port.

(2) Vessel B

The statement of Skipper B indicates the following.

In 2012, Vessel B was operated for tuna fishing off Ogasawara from January through March, off Choshi in April and May and, after a closure from June until early August, off Sanriku from the middle of August through December, with each voyage lasting 14 to 15 days.

2.8.2 Operations Management

(1) Vessel A

The written responses to the questionnaire by Company A indicate the following.

Company A provided the crewmembers of Vessel A with pre-boarding retraining by a crew manning company on safety management and related manuals. In addition, Company A prepared essential documents including the Bridge Management Information Guide, which primarily covers the responsibilities of those on navigational watch and navigational watch procedures, as well as cautionary reminders, and regularly distributed these materials and provided educational sessions using them.

Persons in charge from Company A visited Vessel A as much as possible whenever the vessel made port calls in Japan and provided educational sessions on navigation safety, inspecting the vessel and communicating with the crewmembers.

(2) Vessel B

Details could not be ascertained due to the unavailability of cooperation from Vessel Owner B and Skipper B.

2.9 Search and Rescue

Information provided by the Japan Coast Guard indicates the following.

At around 00:03 on January 24, the 3rd Regional Command Operation Center received a report from Vessel A about the collision and was requested to provide rescue operation for Vessel B's crewmembers.

At around 00:15, upon being updated by Vessel A that crewmembers of Vessel B were found on the Lift Raft, the 3rd Regional Command Operation Center issued a request for rescue cooperation from any vessels sailing nearby, while dispatching patrol boats.

At around 01:05, the 3rd Regional Command Operation Center was informed by Vessel A

that all six crewmembers of Vessel B on the Lift Raft had been rescued.

At around 01:55, one of the dispatched patrol boats arrived near the area of the accident, but the transfer of Vessel B's crewmembers from Vessel A to the patrol boat was not possible due to the rough sea conditions. It was then decided to transport the crewmembers by Vessel A to Keihin Port, the port of destination.

The patrol boats searched the area for the hull and the Lift Raft of Vessel B. At around 07:55, a rotor craft joined the search effort.

At around 08:05, the patrol boats found the bow of Vessel B and, on it, confirmed the vessel name.

At around 10:20, Vessel A arrived at Keihin Port and four of the six crewmembers of Vessel B together with Vessel Owner B headed for a hospital.

At around 11:30, a fixed-wing aircraft from the 3rd Regional Coast Guard Headquarters started search operations. At around 11:59, the Life Raft was found. At around 13:32, the raft was collected by one of the patrol boats.

At around 14:30, the patrol boats started towing operation for Vessel B's bow. At around 20:40, however, the operation was deemed too dangerous to continue with the worsening weather and eventually had to be abandoned.

The 3rd Regional Coast Guard Headquarters issued navigational warnings against the drifting bow of Vessel B.

At around 14:06 on February 4, the bow of Vessel B was found off Ibaraki Port, Ibaraki Prefecture. A towing attempt was made again using a tug boat arranged by Vessel Owner B. However, the operation had to be abandoned again due to bad weather. At around 11:05 on February 6, there was an eyewitness report of the bow drifting off Onahama Port, Fukushima Prefecture. Bad weather continued and there have since been no reports of sighting the bow.

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Course of Events

Considering the descriptions in 2.1, it is probable that the accident occurred through the following course of events.

(1) Vessel A

1. At around 22:30 on January 23, 2013, while sailing east of Katsuura Port, Vessel A changed its course over ground so that the ship will head for 228°, and continued sailing at about 16.8 kn.
2. At around 23:00, Officer A₃ had changed the course to around 228°.
3. At around 23:10:39, Helmsman A₃ sighted Vessel B with its port side light on at a distance of about 0.6 M on the starboard bow and reported the sighting to Officer A₃.
4. At around 23:11:34, Officer A₃ found Vessel B with its port side light on at a distance of about 0.3 M on the starboard bow crossing ahead of the bow of Vessel A to the port side. Officer A₃ then ordered Helmsman A₃ to turn the rudder 15° to

starboard, blew the whistle, gave warning with the daylight signaling lights and ordered Helmsman A₃ to put the rudder hard to starboard. However, Vessel A collided with Vessel B.

(2) Vessel B

1. At around 22:30, while sitting in a chair at the rear of the upper bridge on the starboard side, Skipper B kept the vessel sailing with the autopilot engaged.
2. At around 23:08, Skipper B ordered that the rudder be turned about 15° to starboard and the course set to about 090°.
3. At around 23:11, Skipper B ordered that the course be set to about 180°. At about 23:12, however, Vessel B collided with Vessel A.

3.1.2 Events at the Time of the Accident

Considering the descriptions in 2.1.1, 2.1.2 and 2.3, it is probable that as Vessel A changed its course to about 248°, its bow collided with Vessel B at around the middle portion on the port side, which was sailing with the course set to about 180°.

3.1.3 Date, Time and Location of the Accident

Considering the descriptions in 2.1, it is probable that the accident occurred at around 23:12 on January 23, 2013, approximately 116°, 11.4 M from the Katsuura Lighthouse.

3.1.4 Damage to the Vessels

Considering the descriptions in 2.3, it is probable that Vessel A sustained scratches to its bow while Vessel B broke apart at around the middle of the hull and sank.

3.2 Causal Factors of the Accident

3.2.1 Crewmembers

The descriptions in 2.4 (1) indicate the following.

(1) Officer A₃

Officer A₃ possessed a legal and valid endorsement attesting the recognition of certificate under STCW Regulation I/10 for Second Officer (issued by the Republic of Panama).

At the time of the accident, it is probable that Officer A₃ was in good health.

(2) Helmsman A₃

Helmsman A₃ possessed a legal and valid certificate for Deck Watchkeeper.

At the time of the accident, it is probable that Helmsman A₃ was in good health.

(3) Skipper B

Skipper B possessed a legal and valid certificate for Boat Operator.

At the time of the accident, it is probable that Skipper B was in good health.

3.2.2 Vessels

Considering the descriptions in 2.5.3, it is probable that the condition of the vessels was as follows.

(1) Navigation Lights

At the time of the accident, the navigation lights of Vessel A and the masthead and side lights of Vessel B were illuminated.

(2) Other Equipment

No problems or failures were found with the hulls, main engines or other equipment of Vessel A and Vessel B.

3.2.3 Weather and Sea Conditions

The descriptions in 2.1 and 2.6 indicate the following.

- (1) It is probable that at the time of the accident, it was raining with a wind direction of NNW, a wind speed of around 8.1 m/s, a wave height of around 2–3 m and a temperature of about 10°C.
- (2) Visibility at the time of the accident could not be ascertained although it is probable that it had been reduced due to the rain.

3.2.4 Radar Echoes of Vessel B and Change in Vessel A's Bearing

(1) Echoes of Vessel B on Vessel A's Radar Screen

Considering the descriptions in 2.1.1 (4) and (5), it is probable that echoes of Vessel B with its radar trails started appearing on Vessel A's radar screen at around 22:58:12.

(2) Change in Vessel A's Bearing and Closest Point of Approach

Considering the descriptions in 2.1.1 (3) and 2.1.2 (2), it is probable that the conditions of the vessels were as follows.

1. Change in Bearing

Skipper B stated that at around 22:58 he spotted Vessel A on the radar screen at a distance of about 4.0 M on the starboard bow. However, it was around 23:02:12 that Vessel A was around 4.0 M away from Vessel B. In addition, Skipper B stated that Vessel A was about 2.0 M away when he sighted its starboard side light. Considering this, it was around 23:07:12 that the distance from Vessel A was about 2.0 M.

The bearing of Vessel A as seen from Vessel B changed by about 9.3° to the starboard side between around 23:02:12 when Skipper B sighted Vessel A and around 23:07:12 when Skipper B sighted Vessel A's starboard side light.

2. Closest point of approach

The course of Vessel B as seen from Vessel A was around 040° between around 22:58:12 and around 23:06:12. If both Vessel A and Vessel B had maintained their course and speed, Vessel B would have been at a distance of about 0.6 M at around 80° on the starboard bow of Vessel A when they came closest to each other.

3.2.5 Watchkeeping and Vessel Maneuvering

The descriptions in 2.1, 3.1.1 and 3.2.4 indicate the following.

(1) Vessel A

1. It is probable that Officer A₃ took his post near the No. 1 Radar and Helmsman A₃ near the No. 2 Radar for navigational watch.

2. It is probable that Officer A₃ and Helmsman A₃ were chatting between around 22:58 and around 23:09, primarily about a drama and the actor and actress who were in the drama.
3. It is certain that Officer A₃ and Helmsman A₃ switched the VHF radiotelephone from Channel 16 to Channel 69 at around 23:03:06 for communications between other vessels.
4. It is probable that at around 23:10:39, Helmsman A₃ sighted Vessel B at a distance of about 0.6 M on the starboard bow and reported the sighting to Officer A₃.
5. It is probable that, as he could not identify Vessel B as reported by Helmsman A₃, at around 23:11:27 Officer A₃ switched the range of the No. 1 Radar from 12 M to 6 M and kept a look-out; that at around 23:11:34 Officer A₃ found Vessel B with the port side light on at a distance of about 0.3 M on the starboard bow and thought it was crossing ahead of the bow of Vessel A to the port side; that Officer A₃ therefore ordered Helmsman A₃ to turn the rudder 15° to starboard, blew the whistle, gave warning with the daylight signaling lights and ordered Helmsman A₃ to put the rudder hard to starboard; and that at around 23:12, however, the bow of Vessel A collided with Vessel B at around the middle of its hull on the port side.
6. It is probable that, based on the descriptions in 2 and 3 above, Officer A₃'s attention was so diverted by chatting with Helmsman A₃ and listening to communications between other vessels that he was not keeping a proper look-out on the radar and he did not sight Vessel B until it was about 0.3 M away.
7. It is somewhat likely that, had Officer A₃ kept a proper look-out on the radar, he would have been able to spot the echo of Vessel B on the screen at around 22:58:12 and take appropriate actions while monitoring the maneuvers of Vessel B to avoid the collision.

(2) Vessel B

1. It is probable that at around 22:30, as the vessel was nearing land and the traffic was becoming heavier, Skipper B went to the upper bridge to take over the navigational watch from Trainee B₁.
2. It is probable that Trainee B₁ stayed with Skipper B on the watch until about 23:00.
3. It is probable that Skipper B kept a look-out while sitting in a chair at the rear of the upper bridge on the starboard side, occasionally scanning the radar at the front of the upper bridge on the port side and watching outside through a pair of binoculars.
4. It is probable that at around 23:02, while the vessel was sailing with the course set to about 025° and at a speed of about 8.0 kn, Skipper B spotted on the radar screen the echo of Vessel A at around 24° at a distance of about 4.0 M on the starboard bow but did not use the radar cursor or other means to monitor changes in Vessel A's bearing, and that he kept a look-out of Vessel A by sight even though its navigation lights were difficult to see.
5. It is probable that at around 23:07, when the distance from Vessel A narrowed to about 2 M, Skipper B sighted the starboard side light of Vessel A on the starboard bow and, as Vessel A's bearing did not change, thought that there was a risk of

collision, but that, as described in 4 above, instead of using the radar cursor or other means to monitor changes in Vessel A's bearing, he just kept a look-out of Vessel A by sight even though its navigation lights were difficult to see, and therefore that he did not properly monitor the maneuvers of Vessel A, although it is probable that there was no risk of collision with Vessel A as the bearing of Vessel A shifted about 9.3° to the starboard side about five minutes from when Skipper B spotted Vessel A to when he thought of the risk of collision and also Vessel A was on the starboard bow and was showing its starboard side light.

6. It is probable that Skipper B decided to avoid a possible collision by changing course, and that, as he believed that passing port-to-port was the norm, at around 23:08 turned the rudder about 15° to starboard and set the course to about 090°.
7. It is probable that, after setting the course to about 090°, Skipper B noticed that the heading of Vessel A changed slightly toward the bow of Vessel B; that Skipper B, however, felt that the two vessels would collide as he saw Vessel A's starboard side light coming closer to the port side; and therefore that at around 23:11 he had the course set to about 180° and then heard the whistle of Vessel A.

3.2.6 Operations Management of the Vessels

The descriptions in 2.8.2 indicate the following.

(1) Vessel A

Company A provided the crewmembers of Vessel A with pre-boarding retraining by a crew manning company on safety management and related manuals. In addition, Company A prepared essential documents including the Bridge Management Information Guide as well as cautionary reminders, and regularly distributed these materials and provided education sessions using them.

Persons in charge from Company A visited Vessel A as much as possible whenever the vessel made port calls in Japan and provided educational sessions on navigation safety, inspecting the vessel and communicating with the crewmembers.

(2) Vessel B

Details could not be ascertained due to the unavailability of cooperation from Vessel Owner B and Skipper B.

3.2.7 Analysis of the Occurrence of the Accident

The descriptions in 2.1, 2.8, 3.1.1, 3.2.4 and 3.2.5 indicate the following.

(1) Vessel A

1. It is probable that, while Vessel A was proceeding southeastward, east-southeast off Katsuura Port, Officer A₃ and Helmsman A₃, both on navigational watch, chatted with each other between around 22:58 and around 23:09 on January 23, primarily about a drama and the actor and actress who were in the drama, while at the same time listening to communications between other vessels over the VHF radiotelephone from around 23:03:06.
2. It is probable that Officer A₃'s attention was so diverted by chatting with Helmsman A₃ and listening to communications between other vessels that he was

not keeping a proper look-out on the radar.

3. It is probable that at around 23:10:39, Helmsman A₃ sighted Vessel B at a distance of about 0.6 M on the starboard bow and reported the sighting to Officer A₃.
4. It is probable that Officer A₃ found Vessel B with its port side light on at a distance of about 0.3 M on the starboard bow crossing ahead of the bow of Vessel A to the port side.
5. It is probable that, although Officer A₃ took actions to avoid the collision including by turning the rudder to starboard, Vessel A and Vessel B collided with each other.

(2) Vessel B

1. It is probable that, while Vessel B was proceeding north-northeastward, east-southeast off Katsuura Port, Skipper B kept watch while sitting in a chair at the rear of the upper bridge on the starboard side, occasionally scanning the radar and watching outside through a pair of binoculars.
2. It is probable that at around 23:02, Skipper B spotted on the radar screen the echo of Vessel A at around 24° at a distance of about 4.0 M on the starboard bow but did not use the radar cursor or other means to monitor changes in Vessel A's bearing, and that he kept a look-out of Vessel A by sight even though its navigation lights were difficult to see.
3. It is probable that when the distance from Vessel A narrowed to about 2 M, Skipper B sighted the starboard side light of Vessel A on the starboard bow; that, because he was not properly monitoring the maneuvers of Vessel A, he saw no change in Vessel A's bearing, thought of the risk of collision and decided to take actions to avoid a possible collision; and that, as he believed that passing port-to-port was the norm, at around 23:08 turned the rudder to starboard and set the course to about 090°.
4. It is probable that, as he saw Vessel A's starboard side light coming closer to the port side, Skipper B felt that the vessels would collide with each other and therefore had the course set to about 180°, only to see both vessels collide.

(See Figure 4: VTA Analysis.)

3.3 Analysis of Measures to Mitigate Consequences

The descriptions in 2.1.3 indicate the following.

It is probable that all crewmembers of Vessel B were able to avoid drowning after the collision by transferring to the Life Raft.

It is probable that the crewmembers of Vessel B still had the stamina to climb the rescue ladder because they had been protected from winds and waves by the roof set up on the Life Raft as well as having been on the raft for only about an hour before being found by the use of rescue signals.

It is probable that the crewmembers of Vessel A were able to rescue all the crewmembers of Vessel B about two hours after the collision because they had started searching for Vessel B and its crewmembers immediately after the collision using searchlights and other means.

It is probable that the crewmembers of Vessel A tried to help the rescued crewmembers of Vessel B recover their physical strength by providing them with blankets, dry clothes, food,

drink, etc.

4 CONCLUSIONS

4.1 Findings

- (1) It is probable that, while Vessel A was proceeding southeastward, east-southeast off Katsuura Port, Officer A₃ and Helmsman A₃ chatted with each other about a drama and the actor and actress who were in the drama, while at the same time listening to communications between other vessels over the VHF radiotelephone. (3.2.7 (1) 1)*⁹
- (2) It is probable that Officer A₃'s attention was so diverted by chatting with Helmsman A₃ and listening to communications between other vessels that he was not keeping a proper look-out on the radar. (3.2.7 (1) 2)
- (3) It is probable that, while Vessel B was proceeding north-northeastward, east-southeast off Katsuura Port, Skipper B spotted on the radar screen the echo of Vessel A at a distance of about 4.0 M on the starboard bow but did not properly monitor the maneuvers of Vessel A because instead of using the radar cursor or other means to monitor changes in Vessel A's bearing, he just kept a look-out of Vessel A by sight even though its navigation lights were difficult to see, and therefore that, when the distance from Vessel A narrowed to about 2 M, he saw no change in Vessel A's bearing and thought that there was a risk of collision. (3.2.7 (2) 1, 2, 3)
- (4) It is probable that Skipper B decided to take actions to avoid a possible collision, and that, as he believed that passing port-to-port was the norm, he had the rudder turned to starboard. (3.2.7 (2) 3)

4.2 Probable Causes

It is probable that in this accident, while Vessel A was proceeding southwestward and Vessel B north-northeastward, east-southeast off Katsuura Port during nighttime, Officer A₃ was not keeping a proper look-out on the radar while Skipper B was not properly monitoring the maneuvers of Vessel A and, thinking that there was a risk of collision with Vessel A, turned the rudder to starboard, resulting in a collision.

It is probable that Officer A₃ was not keeping a proper look-out on the radar because he was chatting with Helmsman A₃ and listening to communications between other vessels.

It is probable that Skipper B did not properly monitor the maneuvers of Vessel A because instead of using the radar cursor or other means to monitor changes in Vessel A's bearing, he just kept a look-out of Vessel A by sight even though its navigation lights were difficult to see.

It is probable that Skipper B had the rudder turned to starboard thinking that there was a risk of collision with Vessel A because he believed that passing port-to-port was the norm.

5 SAFETY ACTIONS

*⁹The figures in the brackets in this section (4.1) correspond to the subsections of "3 ANALYSIS."

It is probable that in this accident, while Vessel A was proceeding southwestward and Vessel B north-northeastward, east-southeast off Katsuura Port during nighttime, Officer A₃ was not keeping a proper look-out on the radar, while Skipper B was not properly monitoring the maneuvers of Vessel A and, thinking that there was a risk of collision with Vessel A, turned the rudder to starboard, resulting in a collision.

It is probable that Officer A₃ was not keeping a proper look-out on the radar because he was chatting with Helmsman A₃ and listening to communications between other vessels.

It is probable that Skipper B did not properly monitor the maneuvers of Vessel A because instead of using the radar cursor or other means to monitor changes in Vessel A's bearing, he just kept a look-out of Vessel A by sight even though its navigation lights were difficult to see.

It is probable that Skipper B had the rudder turned to starboard thinking that there was a risk of collision with Vessel A because he believed that passing port-to-port was the norm.

Therefore, those in charge of navigational watch on the bridge must not engage in any activities including turning their attention to chatting that may adversely affect the look-out and must keep a proper look-out on the radar for early detection of other vessels. When approaching a vessel ahead, monitor for any change in its bearing on a radar screen using the cursor or similar means to accurately determine whether or not there is a risk of collision. If there is a risk of collision, take appropriate actions so that the two vessels can pass each other while maintaining a safe distance.

5.1 Safety Actions Taken

Following the accident, Company A carried out an analysis including of the data from Vessel A's VDR and, on February 12, 2013, distributed the following notification concerning accident prevention and related actions to the masters of the vessels under its management.

POINT OF ISSUE:

1) CHECKED THE VDR AND FOUND THAT THE OBJECT ALREADY INDICATED MORE THAN 4 MILES ON THE RADAR SCREEN. AND THE BOAT COULD BE SEEN ON THE RADAR NOT ALWAYS BUT SOMETIMES DISPLAY PORT BOW WITH TRAIL'S DIRECTION CROSSED OUR SHIP'S HEAD TO STARBOARD BUT ALMOST HEAD-ON IN FIRST STAGE.

2) DUTY OFFICER AND AB DID NOT OFTEN CHECKED RADAR. AND AT THE TIME OF CHECKING, ONLY SHORT WHILE SEE THE SCREEN AND IT COULD NOT FIND TRAIL OF THE OBJECT ON THE SCREEN.

3) WEATHER WAS RAINING WITH RESTRICTED VISIBILITY AND LARGE WAVES.

CONCLUSION:

1) THE SHIP LOST CHANCE TO ESCAPE FROM HEAD-ON FISHING BOAT.

2) IF THE DUTY OFFICER AND AB CARRIED OUT MORE FREQUENT RADAR WATCH

DURING RESTRICTED VISIBILITY. AND TRY TO ADJUST SEA REFLECTION TO FIND A TARGET NEARBY. THEY COULD FIND THE TARGET BOAT ON THE RADAR SCREEN DETECT THE BOAT WITH TRAIL.

3) "HE" COULD ESTIMATE BY THE TRAIL AS THE BOAT WOULD CROSS PORT TO STARBOARD.

4) AND THEN "OUR SHIP" COULD BE TURNED TO PORT WITH LARGE RUDDER ANGLE IN EARLY STAGE.

OTHERS:

1) AFTER COLLISION, HE CALLED THE MASTER.

2) THE MASTER BEHAVIOR IS CALM AND THEN EVERY CREW KEPT THEIR COOL MIND INCLUDE DUTY OFFICER AND AB. MAY BE, THIS IS A POINT/REASON OF THE SHIP COULD RESCUE THE ALL FISHERMEN ON A LIFE RAFT.

In addition, Company A provided retraining for the crewmembers of the vessels under its management in line with the contents of the Bridge Management Information Guide that covered, among other things, the obligations and roles of those on navigational watch.

5.2 Safety Actions Required

Those in charge of navigational watch on the bridge must make every effort to avoid recurrence of accidents by paying careful attention to the following points.

- (1) Do not engage in any activities including turning their attention to chatting that may affect the look-out performance, and keep a proper look-out on the radar for early detection of other traffic.
- (2) When approaching a vessel, monitor for any change in its bearing on a radar screen using the cursor or similar means to accurately determine whether or not there is a risk of collision. If there is a risk of collision, take appropriate actions so that the two vessels can pass each other while maintaining a safe distance.

Figure 1 Estimated Vessel Tracks

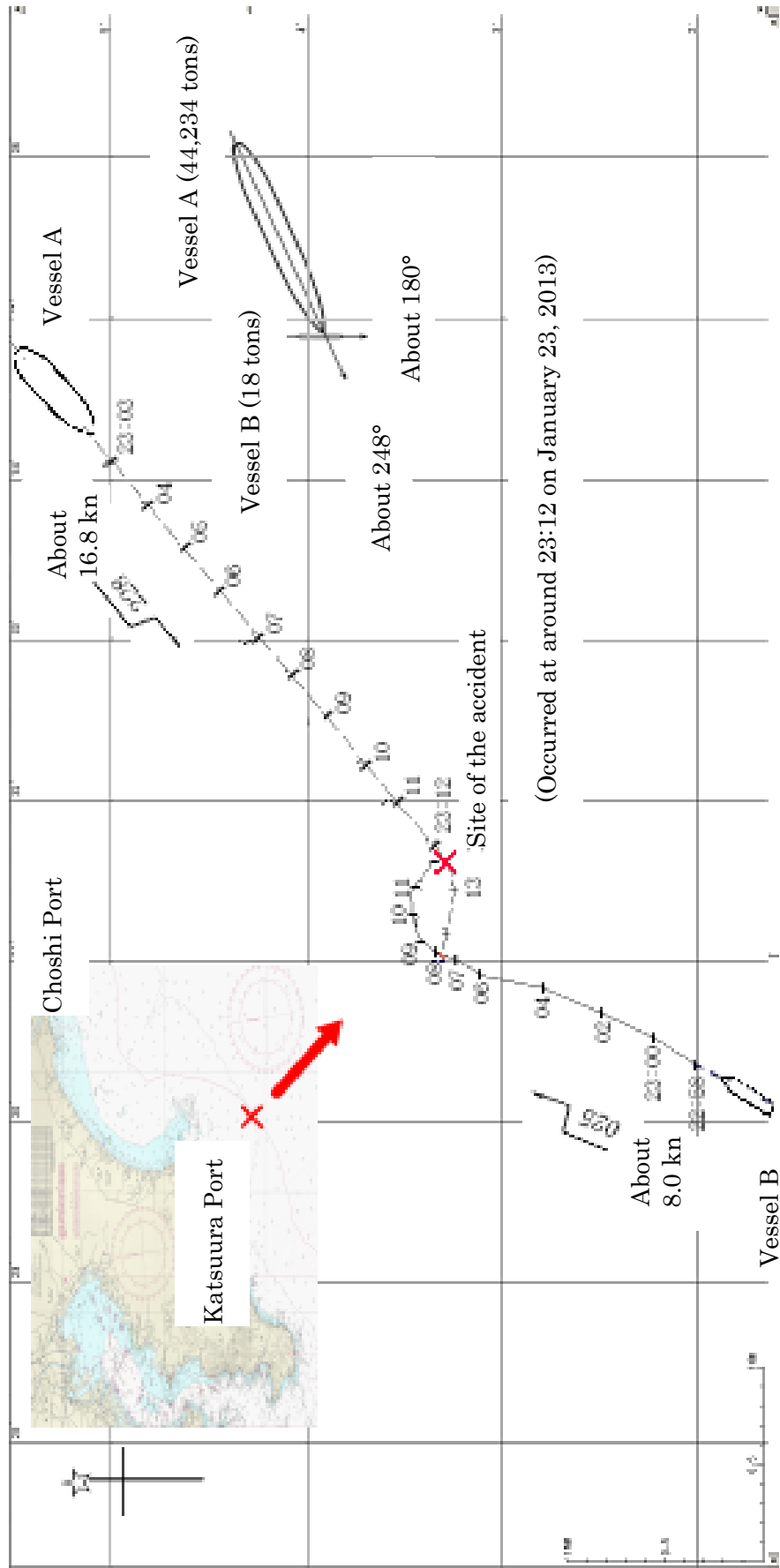


Figure 2 General Arrangement of Vessel A

GENERAL ARRANGEMENT
4,500TEU CLASS CONTAINER CARRIER

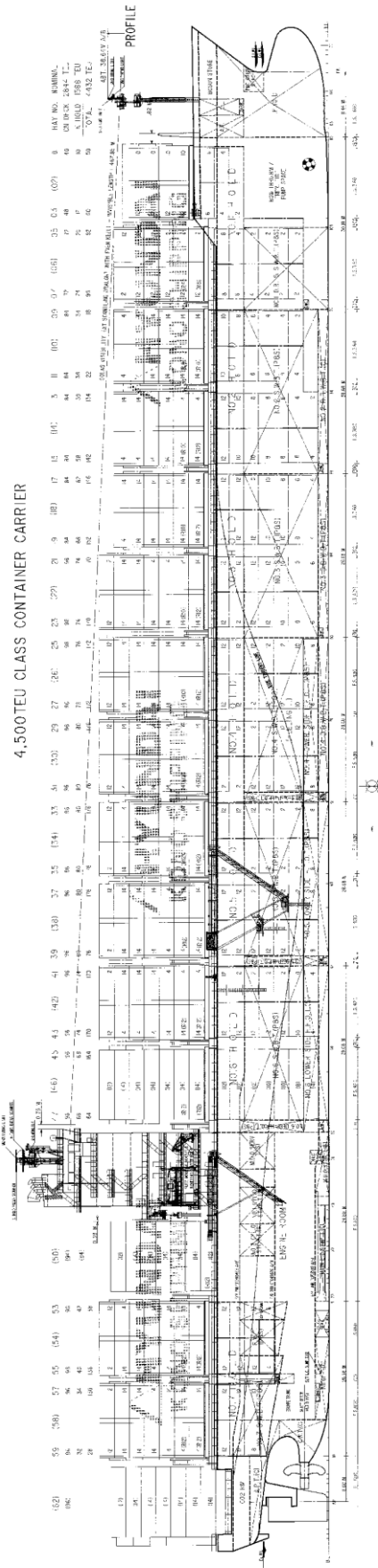


Figure 3 General Arrangement of Vessel B

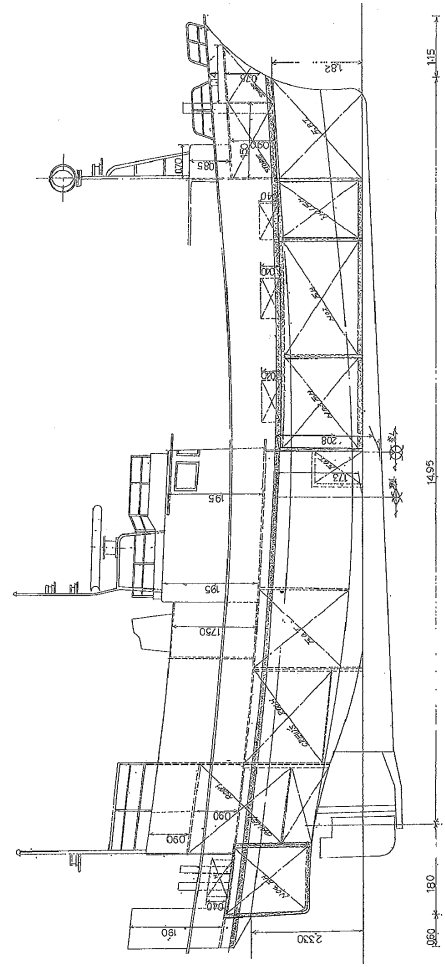


Figure 4 VTA Analysis

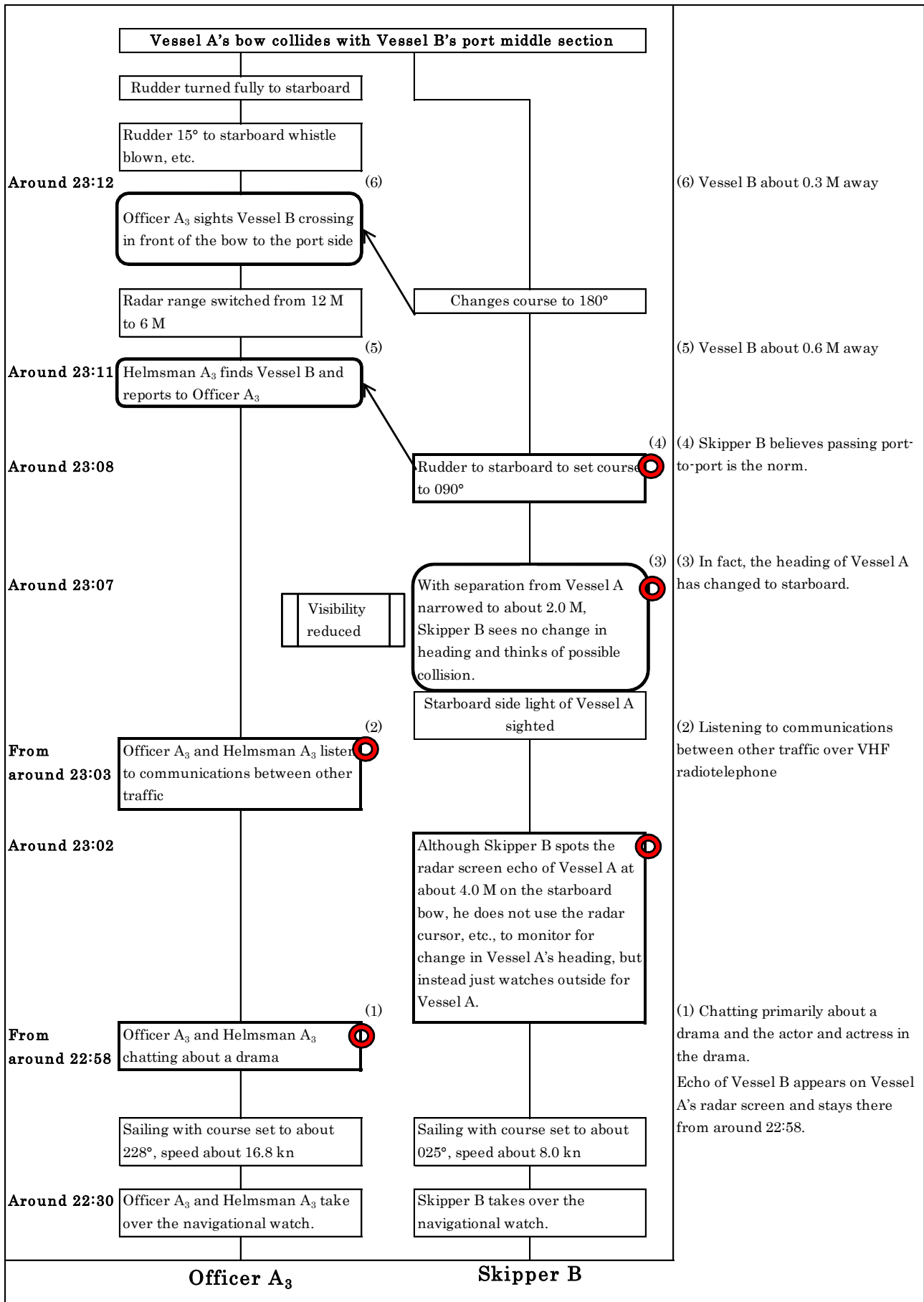


Table 1 VDR Voice Recordings

Time	Main verbal communication
Around 22:58:19	Tingnan mo yung iyak ni, John tsaka yung iyak kaya nya sa mga pelikula iyak nila pulang-pula ang mata. (T) (Look how John is crying. That's exactly the way he cries in films. His eyes are so red.) (Third officer)
Around 22:58:35	Parang pinipigilan pa kunwari (T) (He seems to be holding back tears.) (Third officer)
Around 22:58:38	Umaarte pa dyan si Anne Curtis, umaarte pa (T) (He acts like Anne Curtis.) (Helmsman)
Around 22:58:53	Ganda daw si Kaye (T) (Kaye is beautiful, isn't she?) (Helmsman)
Around 22:59:04	Umiiyak din (T) (She is crying.) (Helmsman)
Around 22:59:08	Kakaiyak din (T) (Makes us almost cry.) (Third officer)
Around 22:59:15	Ilan taon na yan si Jolina? (T) (How old do you think Jolina is?) (Third officer)
Around 22:59:18	Bata pa nga yun (T) (She may be young.) (Helmsman)
Around 22:59:19	Bata pa nga eh (T) (She is young, indeed.) (Third officer)
Around 22:59:23	Disiotso ata, disinwebe (T) (I think she is 18 or 19.) (Helmsman)
Around 22:59:31	Sikat na sikat (T) (She is a real hit.) (Helmsman)
Around 23:00:45	Lilipat yan siguro sa Eat Bulaga, biglang sisikat yan, sisikat yan (T) (She may be even more popular if she transfers to the Eat Bulaga variety show.) (Third officer)
Around 23:05:33	Bakit saan ba sya galling? (T) (Which show is she from?) (Third officer)
Around 23:05:37	Hindi dun galing si Billy (T) (Billy is not from that show. She's from this show.) (Helmsman)
Around 23:06:27	3rd year High School ako noon eh (T) (She was popular when I was a third grader in junior high school.) (Helmsman)
Around 23:07:45	Kinukuha yan ni Willie na maging host sa Wowowie (T) (She became the host of Wowowie after being requested by Willie.) (Helmsman)
Around 23:08:14	Napilitan (T) (But, she was forced to.) (Third officer)
Around 23:09:26	Iba yung mga ginawa nila na maging host (T) (That's not the case with them. They hired a host.) (Third officer)

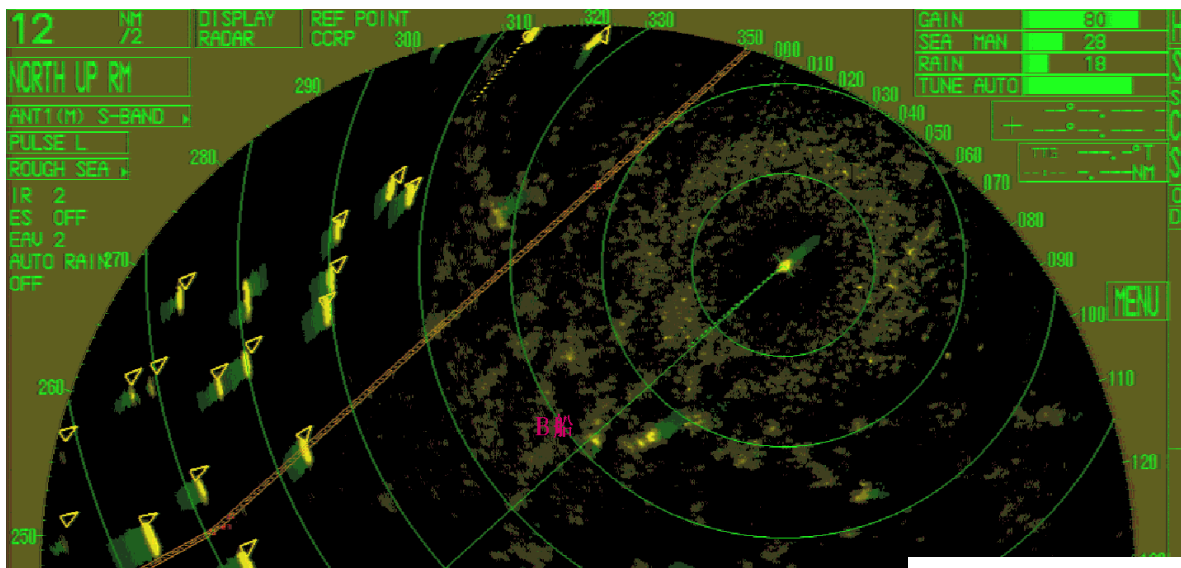
Photo 1 Vessel A



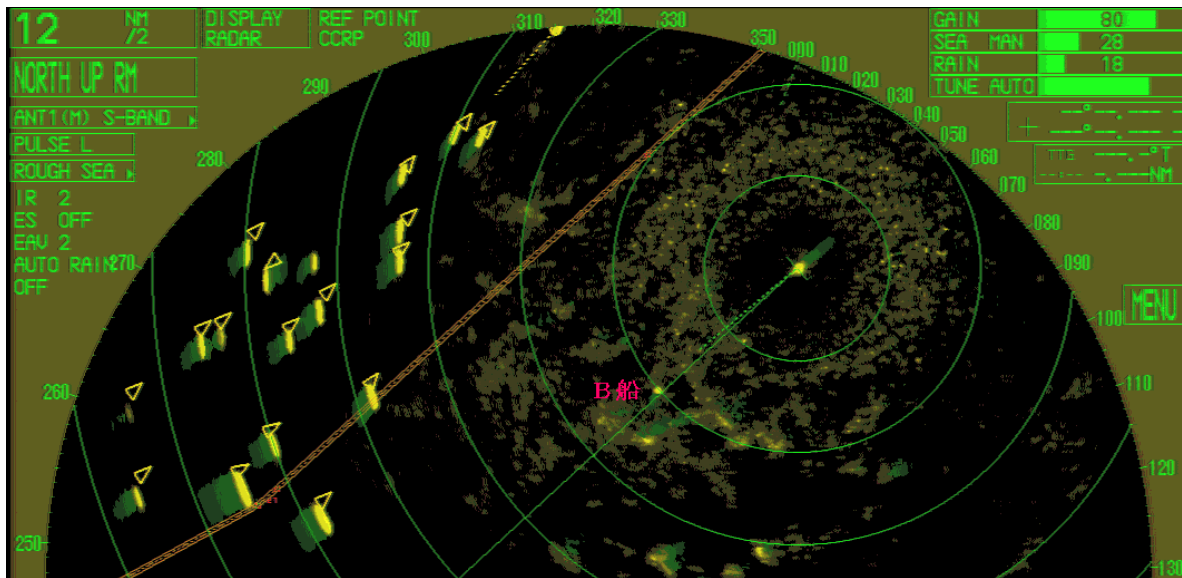
Photo 2 Vessel B



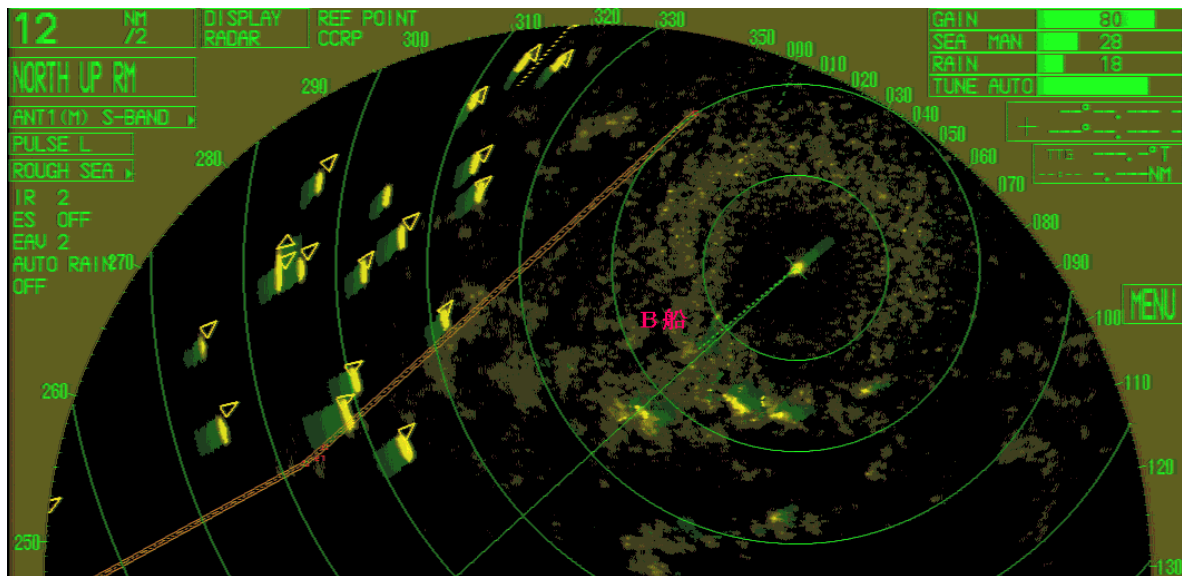
Photo 3 Radar Information from Vessel A's VDR



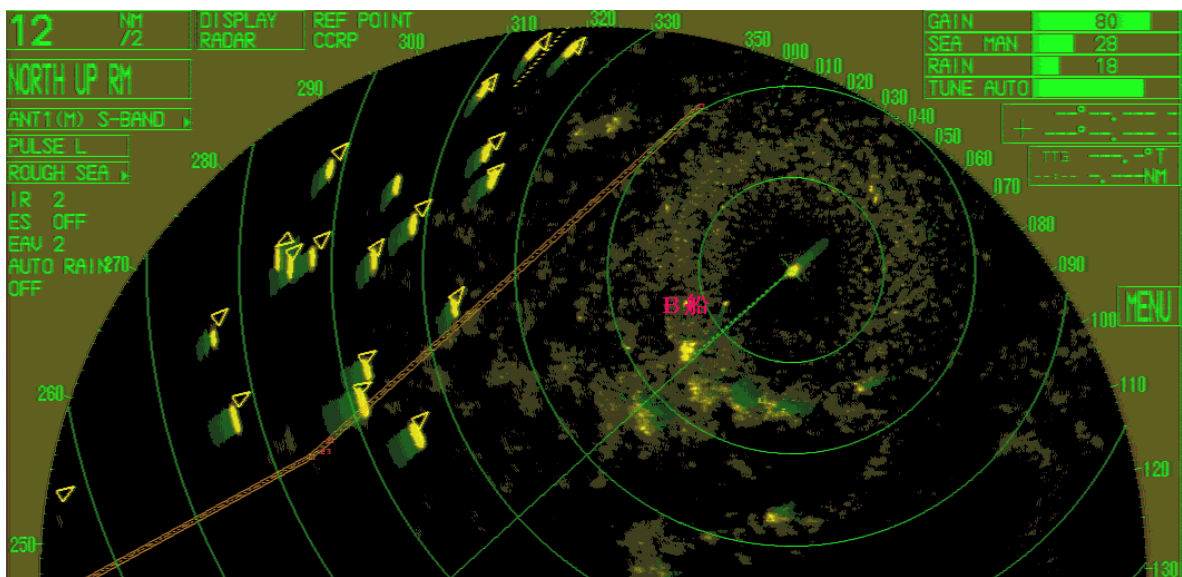
(Around 22:58:12)



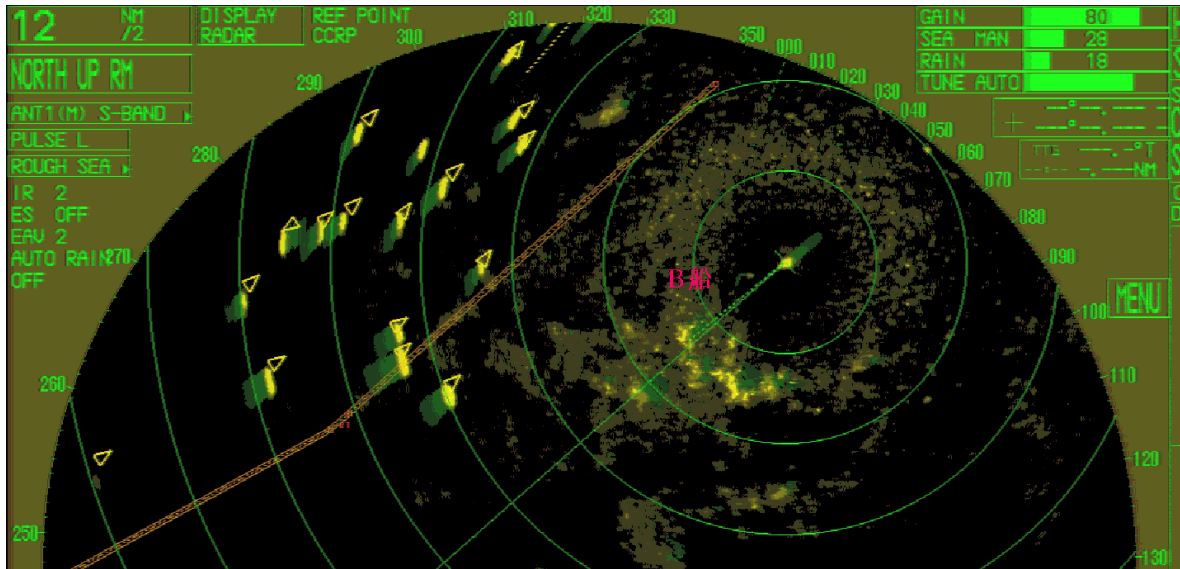
(Around 22:02:12)



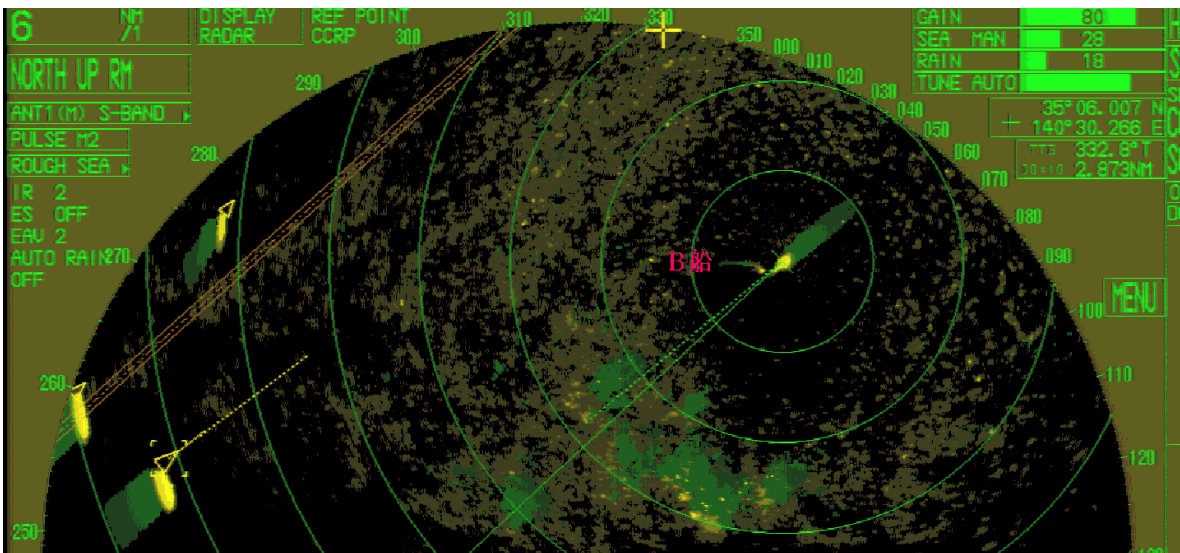
(Around 23:07:12)



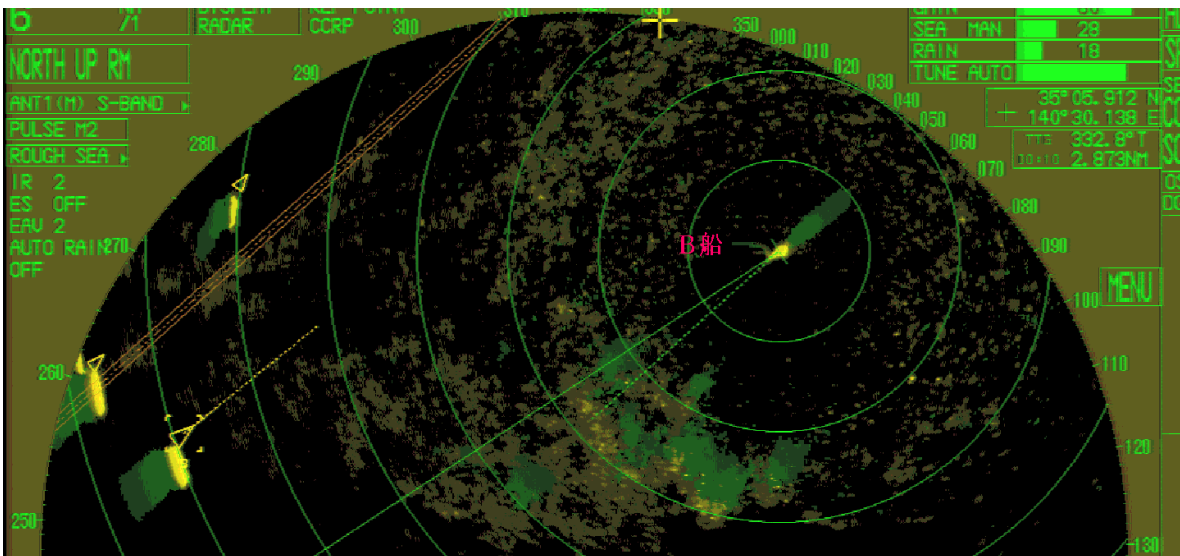
(Around 22:08:12)



(Around 23:10:12)



(Around 22:11:12)



(Around 23:12:12)

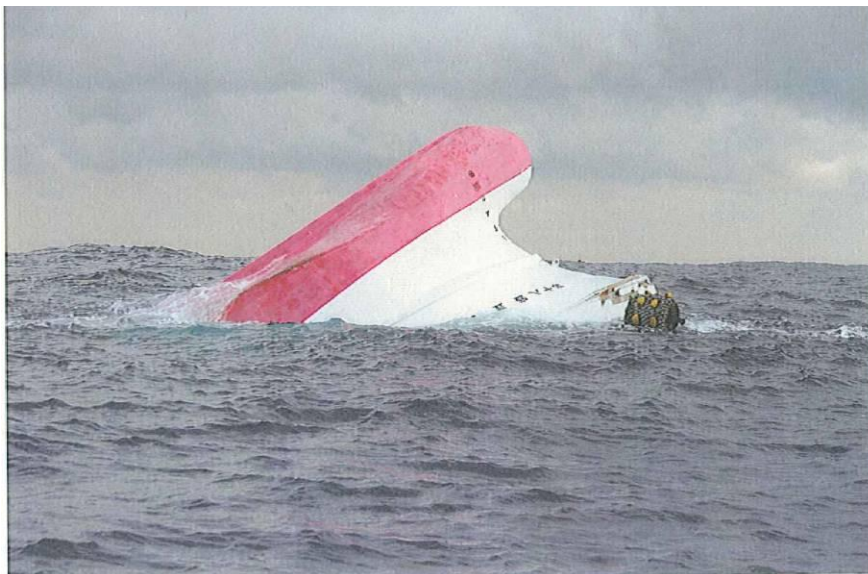
Photo 4 Damage to Vessel A's Starboard Side



Photo 5 Damage to Vessel A's Port Side



Photo 6 Vessel B Left Adrift – Around 13:30, January 24, 2013



* Provided by Japan Coast Guard