

MA2017-3

**MARINE ACCIDENT
INVESTIGATION REPORT**

March 30, 2017



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.

Kazuhiro Nakahashi
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 “SINOKOR INCHEON”

IMO number: 8706650

Gross tonnage: 3,489 tons

Vessel type and name: Fishing Vessel “TOSHIMARU”

Fishing vessel

Registration number: YG3-39849

Gross tonnage: 4.97 tons

Accident type: Collision

Date and time: Around 23:56, February 19, 2016 (local time, UTC +9 hours)

Location: East off Hime Shima, Himeshima Village, Oita Prefecture
Around 087° true, 6.5 nautical miles from the Himeshima Lighthouse
(approximately 33°44.1'N, 131°49.7'E)

March 9, 2017

Adopted by the Japan Transport Safety Board

Chairman Kazuhiro Nakahashi

Member Kuniaki Shoji

Member Satoshi Kosuda

Member Toshiyuki Ishikawa

Member Mina Nemoto

SYNOPSIS

< Summary of the Accident >

While container ship SINOKOR INCHEON was proceeding east toward Mishima-Kawanoe Port, Shikokuchuo City, Ehime Prefecture, with a master and a second officer and other 15 crew members onboard, and while fishing vessel TOSHIMARU was proceeding north-northwest toward Mitajiri District of Mitajiri-Nakanoseki Port, Hofu City, Yamaguchi Prefecture, with a skipper onboard, the two Ships collided at around 23:56 on February 19, 2016, off to the east of Hime Shima, Himeshima Village, Oita Prefecture.

TOSHIMARU received a hole and other damage to her port-side center shell plating and capsized, becoming a total loss. Her skipper was killed.

SINOKOR INCHEON had abrasions on her bulbous bow.

< Probable Causes >

It is probable that, off the eastern coast of Hime Shima at night, while SINOKOR INCHEON was proceeding east and TOSHIMARU was proceeding north-northwest, the SINOKOR INCHEON and TOSHIMARU collided because second officer of SINOKOR INCHEON was not keeping lookout on TOSHIMARU because he thought there was no danger of a collision with TOSHIMARU, and because Skipper of TOSHIMARU did not notice of SINOKOR INCHEON until SINOKOR INCHEON had come close to TOSHIMARU.

It is probable that second officer of SINOKOR INCHEON thought that there was no danger of colliding with TOSHIMARU because, when he extended the radar's true speed vectors, he found that the tip of TOSHIMARU's vector reached a point behind the tip of SINOKOR INCHEON's vector.

It is somewhat likely that Skipper of TOSHIMARU did not notice SINOKOR INCHEON until SINOKOR INCHEON had come close to TOSHIMARU because Skipper of TOSHIMARU had accumulated fatigue; however, it was not possible to determine the situation of lookout as Skipper of TOSHIMARU was killed in this accident.

< Recommendations >

○ Safety Recommendations

In view of the result of this accident investigation, the Japan Transport

Safety Board recommends that KOREA SHIPMANAGERS CO., LTD. should take the following measures.

Instruct all crews on board operating ships to thoroughly comply with “STANDARDS REGARDING WATCHKEEPING” of the mandatory regulations of the STCW convention, the Safety Management Manual and Master’s Standing Order, including keeping appropriate lookout.

1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

While container ship SINOKOR INCHEON was proceeding east toward Mishima-Kawanoe Port, Shikokuchuo City, Ehime Prefecture, with a master and a second officer and other 15 crew members onboard, and while fishing vessel TOSHIMARU was proceeding north-northwest toward Mitajiri District of Mitajiri-Nakanoseki Port, Hofu City, Yamaguchi Prefecture, with a skipper onboard, the two Ships collided at around 23:56 on February 19, 2016, off to the east of Hime Shima, Himeshima Village, Oita Prefecture.

TOSHIMARU received a hole and other damage to her port-side center shell plating and capsized, becoming a total loss. Her skipper was killed.

SINOKOR INCHEON had abrasions on her bulbous bow.

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 the Hiroshima Office and one other investigator to investigate this accident on February 22, 2016.

It should be noted that the JTSB subsequently replaced the investigator-in-charge and other investigator with a marine accident investigator.

1.2.2 Collection of Evidence

February 23, 2016: Interviews and collection of questionnaires

February 24 and July 18, 2016: On-site investigations

March 1, 2, 9, 10, 18 and April 21, 2016: Interviews

March 7 and April 20, 2016: On-site investigations and interviews

April 12, 18 May 6, 9 and 23, 2016: Collection of questionnaires

1.2.3 Comments from Parties Relevant to the Cause

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

1.2.4 Comments from Flag State

Comments on the draft report were invited from the flag State of SINOKOR INCHEON.

2 FACTUAL INFORMATION

2.1 Events Leading to the Accident

2.1.1 The Navigational Track according to the Automatic Identification System

According to the “information records of the Automatic Identification System (AIS)*¹ (hereinafter referred to as “the AIS record”) received by a private company in Japan,” the navigation track of the SINOKOR INCHEON (hereinafter referred to as “Ship A”) was as shown in Table 2.1 below.

The positions of Ship A are the positions of the GPS antennas located on the upper side of the bridge. The course over ground and heading are true bearings (hereinafter the same).

Table 2.1 AIS Record (Excerpt)

Time (H:M:S)	Ship's position		Heading (°)	Course O.G. (°)	Speed O.G. knots(kn)
	Latitude (N) (° - ' - ")	Longitude (E) (° - ' - ")			
23:30:05	33-45-36.8	131-41-53.4	101	101.1	15.5
23:33:05	33-45-27.2	131-42-48.4	101	101.9	15.5
23:36:05	33-45-17.4	131-43-43.3	101	101.5	15.7
23:39:05	33-45-07.7	131-44-38.3	101	101.5	15.6
23:40:05	33-45-04.5	131-44-56.7	100	101.7	15.7
23:41:05	33-45-01.4	131-45-15.1	101	101.5	15.7
23:41:41	33-44-59.4	131-45-26.2	101	101.8	15.7
23:41:45	33-44-59.2	131-45-27.7	102	101.1	15.7
23:41:53	33-44-58.8	131-45-29.5	103	103.1	15.6
23:42:05	33-44-57.9	131-45-33.5	105	105.2	15.6

*¹ Automatic Identification System (AIS) is equipment with which a ship automatically sends/receives information of identification code, type, ship name, ship position, course, speed, destination, and navigation state of the ship for information exchange with another ship or navigation aid facilities of a land station.

23:43:05	33-44-53.7	131-45-51.4	106	104.8	15.3
23:43:17	33-44-52.8	131-45-54.9	110	109.0	15.4
23:43:38	33-44-50.8	131-46-01.4	111	112.0	15.4
23:44:05	33-44-48.4	131-46-08.5	110	111.7	15.3
23:45:05	33-44-42.9	131-46-25.6	110	110.5	15.3
23:46:05	33-44-37.3	131-46-42.8	109	112.5	15.3
23:46:17	33-44-36.1	131-46-46.2	106	110.4	15.2
23:46:38	33-44-34.5	131-46-52.8	100	103.5	14.9
23:47:05	33-44-33.0	131-47-00.1	099	101.4	15.0
23:48:05	33-44-30.2	131-47-17.9	100	101.7	15.1
23:49:05	33-44-27.4	131-47-35.7	100	101.1	15.1
23:50:05	33-44-24.5	131-47-53.5	099	100.4	15.1
23:51:05	33-44-21.7	131-48-11.3	099	100.6	15.1
23:52:05	33-44-18.9	131-48-29.1	099	100.4	15.1
23:53:05	33-44-16.1	131-48-46.9	099	100.8	15.2
23:54:05	33-44-13.3	131-49-04.7	099	101.2	15.1
23:55:04	33-44-10.3	131-49-22.5	099	101.0	15.1
23:55:33	33-44-08.9	131-49-31.4	100	101.3	15.1
23:55:45	33-44-08.3	131-49-35.0	099	100.7	15.2
23:55:50	33-44-08.0	131-49-36.5	099	100.8	15.1
23:56:04	33-44-07.3	131-49-40.3	091	102.4	14.9
23:56:08	33-44-07.2	131-49-41.4	085	099.8	14.6
23:56:09	33-44-07.1	131-49-42.0	082	097.4	14.4
23:56:12	33-44-07.0	131-49-42.6	080	096.5	14.3
23:56:13	33-44-07.0	131-49-43.1	076	093.0	14.0
23:56:14	33-44-07.0	131-49-43.4	074	091.6	13.7
23:56:18	33-44-07.0	131-49-44.0	071	088.2	13.5
23:56:20	33-44-07.0	131-49-44.8	066	085.8	13.3
23:56:21	33-44-07.1	131-49-45.3	063	082.0	13.0
23:56:22	33-44-07.1	131-49-45.5	061	080.4	12.8
23:56:25	33-44-07.3	131-49-46.3	056	075.4	12.5
23:56:26	33-44-07.3	131-49-46.5	055	074.7	12.3
23:56:30	33-44-07.4	131-49-47.0	051	071.2	12.1
23:56:32	33-44-07.7	131-49-47.7	047	066.9	11.9

23:56:33	33-44-07.8	131-49-48.1	045	061.7	11.7
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2.1.2 Events Leading to the Accident according to the Statements of Crew Members

According to the statements of Ship A's master (hereinafter referred to as "Master A"), second officer (hereinafter referred to as "2/O A"), third officer (hereinafter referred to as "3/O A"), and able seaman on watch (hereinafter referred to as "A/B A") as well as, for TOSHIMARU (hereinafter referred to as "Ship B"), members of the family of Ship B's skipper (hereinafter referred to as "Skipper B"), and, for a consort of Ship B's skipper (hereinafter referred to as "Consort Skipper B") and information provided by Japan Coast Guard (hereinafter referred to as "JCG"), the events leading to the accident were as follows.

(1) Ship A

At around 09:55 on February 19, 2016 (local time), Ship A left Busan Port, Republic of Korea, heading to Mishima-Kawanoe Port, with Master A (nationality of the Republic of Korea), 2/O A (nationality of the Republic of Korea), and other 15 crew members onboard.

After leaving Kanmon Passage of Kanmon Port at around 21:20 on February 19, 2016, with regulation lights turned on and 3/O A, together with one Able Seaman, on watch, Ship A was proceeding east off to the west of Hime Shima under autopilot at a speed of approximately 15.5 kn (speed over the ground, hereinafter the same).

Using the No. 1 radar set to a range of 3 nautical miles (M) and 3/O A observed with a head-up and off-center display, 3/O A observed Ship B and a cargo ship (gross tonnage of 1,259 tons; hereinafter referred to as "Ship C") proceeding north, ahead to starboard, by radar.

3/O A looked at the analytic vectors of the Automatic Radar Plotting Aid (ARPA)^{*2} and understood that Ship B would pass Ship A's stern with a closest

^{*2} "Automatic Radar Plotting Aid (ARPA)" refer to a device that automatically processes by computer changes in the images of other ships that were detected by radar and displays the other ships' course, speed, closest point of approach (CPA) and time to closest point of approach (TCPA), predicted position in the future, and that issues an alarm if a risk of collision is predicted by the approach of other vessels.

Additionally, true motion and relative motion appear in screen displays and systems for displaying the motion vectors of other ships. Although there are differences in their display formats, those differences do not influence CPA and TCPA values.

point of approach (CPA) of approximately 0.3 M and that Ship C would approach Ship A from the ahead and cross from the starboard side to the port side. 3/O A set a starboard course with the intention of avoiding an approach with Ship C. After Ship C passed behind Ship A, 3/O A set a course slightly to port of the original course.

At around 23:47, 2/O A came up to the bridge, stood behind the radar, and took over the watch after receiving information that Ship B was approaching by radar image from 3/O A. When 2/O A extended the true speed vectors, which were at three-minute display, he found that the tip of Ship B's vector reached a point behind the tip of Ship A's vector, and he therefore thought that Ship B would pass the stern of Ship A.

On Ship A, the normal practice was to open the chart table's curtain, even when navigating at night. Accordingly, 3/O A was writing the navigation record, etc., after brightening the light of the chart table, with the chart table's curtain open, and left the bridge at around 23:53.

Looking astern, 2/O A conversed with 3/O A until the time that 3/O A left the bridge. At around 23:54, 2/O A received from A/B A on duty a request to leave the bridge to use the head and, simultaneously, a report that Ship B was approaching. When 2/O A looked at Ship B's vector on the radar screen, it appeared to him that the direction and length of the true vector had not changed. He told A/B A there was no problem and granted A/B A permission to leave the bridge.

The door at the rear of the bridge that A/B A used to leave the bridge was not completely closed. 2/O A closed the door and was walking toward the side of the gyro/repeater located in the front center of the bridge when, at around 23:55, he observed Ship B's lights at approximately 300 m to the starboard ahead and realized there was the danger of collision.

Using the daylight signaling lamp installed on the front starboard side, 2/O A flashed Ship B about ten times. However, because there was no change in Ship B's course, 2/O A went to the steering stand, switched to hand steering, and set the rudder hard to port.

Because he did not feel a shock, 2/O A thought that collision had been avoided because Ship B had turned to port. He set the rudder at 10° to starboard, went out onto the wing from the starboard-side door, and looked astern but was unable to observe Ship B's lights.

2/O A returned to the bridge, returned the ship's course to that prior to the action to avoid Ship B, and switched to autopilot. When A/B A later returned from the head, 2/O A informed A/B A that Ship A had come abnormally close to Ship B and asked him if he had felt a shock. Although A/B A responded that he had not, 2/O A telephoned the engine room to be certain. When he asked the engineer on watch if he felt a shock, the engineer replied that he had felt a shock that resembled being a hit by a wave.

Unsure of what to do, 2/O A asked the engineer on watch for advice and was told to contact Master A. However, 2/O A did not want to believe that Ship A had collided with Ship B and, further, he hesitated to call Master A, who was likely napping. He again went out onto the wing and searched astern together with A/B A for a period of time. However, having not seen Ship B's lights, 2/O A stopped searching and returned to the bridge. He telephoned Master A at around 00:30 on February 20 and informed him that they had approached Ship B and that he felt there was a danger of collision.

When Master A came to the bridge and again heard 2/O A tell what happened, he felt that 2/O A's explanation indicating belief that no collision with Ship B had occurred to be vague. He called the other second officer and 3/O A and then went with them to the bow, where they looked for signs of a collision. When they did not find any, Master A believed 2/O A's explanation that no collision had occurred and continued navigating ahead.

At around 07:20, Ship A entered Mishima-Kawanoe Port. The crew again searched for signs of a collision from the wharf but did not find any. Ship A thus continued on her way, leaving port at around 11:15.

At around 13:45, Ship A entered Fukuyama Port, Fukuyama City, Hiroshima Prefecture. At around 17:30 she left port and was sailing toward the Republic of Korea, but at around 19:25 she was inspected by a patrol boat and taken to Tokuyama-Kudamatsu Port, Shunan City, Yamaguchi Prefecture, for a detailed inspection.

(2) Ship B

Ship B, with Skipper B alone onboard, left port in the Mitajiri District of Mitajiri-Nakanoseki Port, Hofu City, Yamaguchi Prefecture, at around 03:00 on February 18 and conducted trawl-net fishing to the east of Oita Airport, Oita Prefecture. Ship B was later observed by Consort Skipper B, who was engaged in operations, as she left the fishing ground at around 22:00 on February 19 and

proceeded north with regulation lights on.

Ordinarily, when Skipper B went out for fishing, he returned to port by 03:00 and helped in catch landing. However, because Ship B did not return to port even after 03:00 on February 20, his family became worried. The family called Skipper B's mobile telephone but the telephone did not ring. Moreover, the family asked returning consorts about Skipper B's whereabouts, but those consorts replied that they did not know. The family then contacted the fishery cooperative to which Ship B belonged.

At around 05:21, JCG received a communication from the fishery cooperative to which Ship B belonged and assigned a patrol boat to conduct a search. At around 06:58, JCG received report from a cargo ship that was navigating near the Suo Nada Passage No. 6 Light Buoy that a capsized ship had been sighted. At around 07:10, Ship B was spotted near the reported location, and at around 08:25, Skipper B was recovered from inside Ship B in a state of cardiopulmonary arrest.

Skipper B was transported by patrol boat to the Tokuyama Coast Guard Office, where he was confirmed dead. Ship B was towed by a consort to Mitajiri-Nakanoseki Port.

(3) Ordinary actions by Skipper B and Consort Skipper B

Skipper B and Consort Skipper B engaged in operations in a manner timed to the tides, dragging their nets in the direction of the current. At the turn of the tide, they hauled in their nets and sorted the catch. They then dragged their nets again, this time going in the opposite direction. They napped while dragging their nets.

When returning to port, they proceeded north from the fishing ground for a period of time to avoid approaching vessels navigating along the recommended route in western Iyo Nada. Around the time that the Tokuyama Passage No. 1 Light Buoy and the south lighthouse on the Tsukiji East Breakwater of Mitajiri-Nakanoseki Port appeared to be on a straight line on the GPS plotter, they changed course to the north-northwest.

When approaching a large vessel, they reduced speed or stopped, regardless of the possibility of a meeting, and accelerated back to speed after the large vessel passed in ahead.

The date and time of occurrence of the accident were at around 23:56 on February 19, 2016, and the location was at about 6.5 nautical miles at 087° true

bearing from the Himeshima Lighthouse.

(See Figure 1 Outline Map of the Course of the Accident Events, Figure 2 Enlarged Map of Ship A's Path (1), and Figure 3 Enlarged Map of Ship A's Path (2))

2.2 Injuries to Persons

(1) Ship A

According to the reply to the questionnaire by Master A and the statement of 2/O A, no one was injured.

(2) Ship B

According to the postmortem certificate, Skipper B died of drowning.

2.3 Damage to Vessel

(1) Ship A

According to information provided by JCG, Ship A had abrasions on her bulbous bow.

(2) Ship B

Ship B had a hole and cracks in her port-side center shell plating and capsized, becoming a total loss. (See Photo 2.3-1 and Photo 2.3-2)



Photo 2.3-1 Damage to Ship B



Photo 2.3-2 Damage (enlarged)

(3) Paint found on Ship B

According to the reply to the questionnaire by JCG, an analysis conducted by a paint manufacturer that was commissioned by JCG determined that there was similarity between paint found on Ship B and some of the hull paint of Ship A.

2.4 Crew Information

(1) Gender, Age, and Certificate of Competence

Master A: Male, 56 years old, national of the Republic of Korea

First-grade maritime officer's certificate of competency (issued by the Republic of Korea)

Date of Issue: March 20, 2013

(Valid until July 30, 2018)

2/O A: Male, 23 years old, national of the Republic of Korea

Third-grade maritime officer's certificate of competency (issued by the Republic of Korea)

Date of Issue: April 29, 2014

(Valid until May 17, 2019)

Skipper B: Male, 83 years old

Permit of boat's operator

Date of Issue: September 27, 1974

Date of revalidation: May 2, 2014

(Valid until May 17, 2019)

(2) Major Sea-going Experience

Master A

According to the reply to the questionnaire by Master A, Master A became a crew member in 1979, became a master in around 2006, and came aboard Ship A on November 22, 2015.

2/O A

According to the statement of 2/O A, 2/O A's sea-going experience was as follows.

- 1) He had experience as a crew member for approximately four years and became a third officer for approximately three years. Subsequently he became a second officer approximately six or seven months prior to this accident and came aboard Ship A on November 22, 2015.
- 2) He had not consumed alcohol and was in good health at the time of the accident.

Skipper B

According to the statement of Skipper B's family, Skipper B became a crew member on a fishing ship owned by his father at about the age of twenty. He began operating Ship B as its sole crew member approximately two years

prior to this accident. He was in good health the time of the accident.

Skipper B was not wearing a life jacket when he was found by JCG.

2.5 Vessel Information

2.5.1 Principal Particulars of Vessel

(1) Ship A

IMO number:	8706650
Port of registry:	Jeju (Republic of Korea)
Owner:	SINOKOR MERCHANT MARINE CO., LTD. (Republic of Korea)
Management Company:	KOREA SHIPMANAGERS CO., LTD. (Republic of Korea) (hereinafter referred to as "Company A", except for Chapter 6)
Classification Society:	KOREAN REGISTER OF SHIPPING (Republic of Korea)
Gross tonnage:	3,489 tons
L×B×D:	108.45m×18.00m×7.50m
Hull material:	Steel
Engine:	Diesel engine x 1
Output:	5,655kW
Propulsion:	4-blade controllable pitch propeller x 1
Date of launch:	September 24, 1987

(See Photo 2.5-1)



Photo 2.5-1 Ship A

(2) Ship B

Fishing Vessel

Registration number: YG3-39849

Main base: Hofu City, Yamaguchi Prefecture

Owner: Privately owned

Gross tonnage: 4.97 tons

Lr×B×D: 10.96m×2.41m×0.86m

Hull material: FRP

Engine: Diesel engine x 1

Output: 48kW

Propulsion: 3-blade fixed pitch propeller x 1

Date of launch: July 20, 1976

(See Photo 2.5-2)



Photo 2.5-2 Ship B

2.5.2 Ship A's Load Conditions

According to Ship A's shipping documents, at the time of her departure from Busan Port, she was loaded with 87 containers (total weight of approximately 1,055.6 tons). The draft was about 3.60 m in the bow and about 6.40 m in the stern.

2.5.3 Hull and Engine

(1) Ship A

According to the reply to the questionnaire by Master A and statements of 2/O A, there was no malfunction or failure in the hull or engine at the time of the accident.

(2) Ship B

At the time of the on-site investigation, the rudder plate was turned hard to starboard, the position of the main engine's throttle lever was "low," and the position of the clutch lever was "neutral."

2.5.4 Navigation Equipment, etc.

(1) Ship A

On the bridge were arranged the steering stand in the center and two radar consoles to its starboard side. Additionally, a gyro/repeater was located in the front center of the bridge, and an AIS display device and VHF radio telephone were positioned to its front starboard side. A daylight signaling lamp was positioned on the front starboard edge of the bridge. (See Figure 2.5)

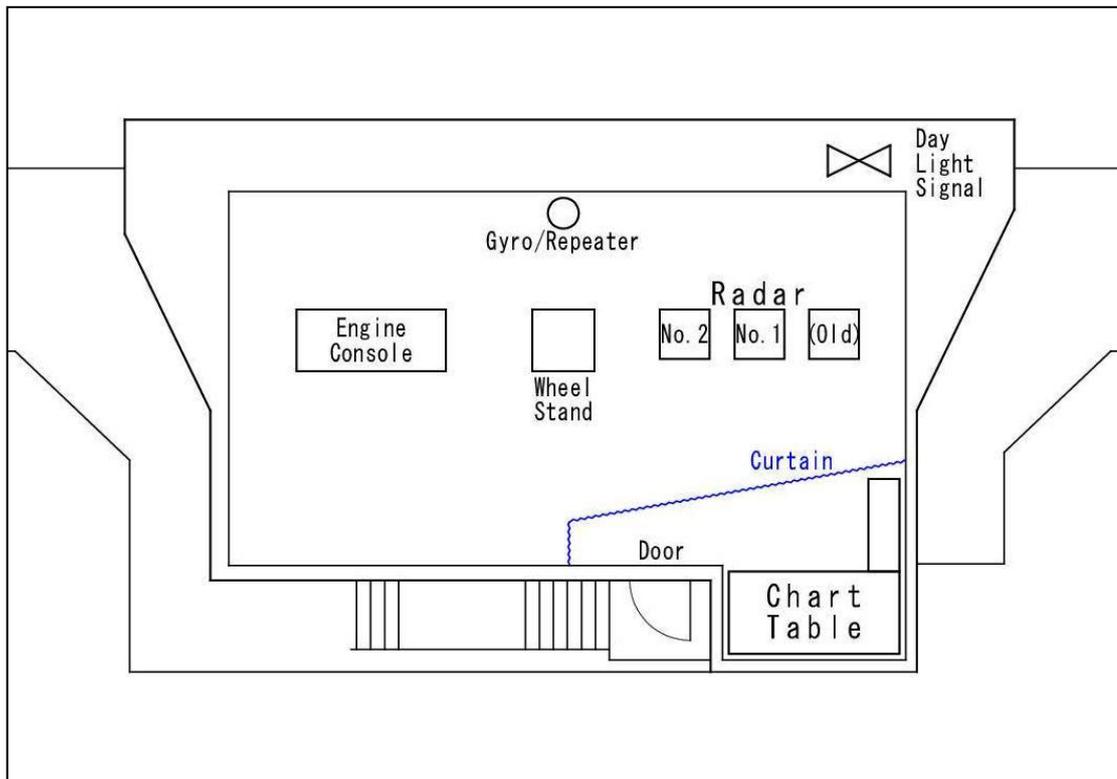


Figure 2.5 Arrangement Plan of Ship A's Bridge

Although a VDR*³ was installed, its record had been overwritten at the time of the accident and was not available.

According to the statement of 2/O A, there was no malfunction or failure with the equipment or machineries at the time of the accident.

(2) Ship B

In the wheel house were installed an autopilot device, magnetic compass, GPS plotter, and fisheries radio.

*³ VDR (Voyage Data Recorder) is a device for recording the information into a recoverable capsule of the navigation data, such as vessel position and speed, exchange data of the VHF wireless phone or the voices over the bridge.

The record of Ship B's GPS plotter was restored; however, the ship's track and other data at the time of the accident were not recorded.

2.5.5 Information concerning Ship A's ARPA

Gyrocompass signals passed through a device that converts analog signals into digital signals and speed (speed over the ground) calculated from GPS were inputted into Ship A's radar.

According to the statement 2/O A, the ARPA on Ship A was normally set to sound a hazard alarm when the CPA of a captured target came within 0.3 M and the TCPA came within five minutes. However, at the time of the accident, 2/O A had set the ARPA to sound a warning when the CPA was within 0.1 M and the TCPA was within one minute. This was because many navigating vessels were approaching at that time that would cause warnings to sound frequently.

2.5.6 Ship A's Maneuverability, etc.

According to Ship A's maneuverability characteristics tables, her maneuverability was as follows.

- (1) Shortest stopping time and distance (ballast condition, speed of 20.4 kn)

Stopping time	2 min 06 sec
Stopping distance	671 m

- (2) Turning performance

	Port 35°	Starboard 35°
Speed	20.4 kn	20.4 kn
Maximum advance* ⁴	341 m	322 m
Maximum transfer* ⁵	402 m	387 m

2.6 Weather and Sea Conditions

2.6.1 Weather and Sea Observations

- (1) Meteorological observations at the Kunimi Regional Meteorological Observation Station, which is located approximately 23 km west-southwest

*⁴ "Maximum advance" refers to the maximum distance of vertical movement on the trajectory that a vessel's center of gravity takes as a result of a rudder turn (turning circle) from the center of gravity's position at the moment that the rudder was turned.

*⁵ "Maximum transfer" refers to the maximum distance of lateral movement in the turning circle that a vessel's center of gravity takes from center of gravity's position at the moment that the rudder was turned.

from the accident site, were as follows.

February 19

23:00 Wind direction: Southwest Wind speed: 0.4 m/s

24:00 Wind direction: South-southwest Wind speed: 0.8 m/s

(2) Meteorological observations at the Oita Local Meteorological Observatory, which is located approximately 59 km south-southwest from the accident site, were as follows.

February 19

23:00 Weather: Rain

24:00 Weather: Rain

(3) According to the JCG website, the average seawater temperature near the accident site on February 19 was 11°C.

2.6.2 Tidal Data

According to the tide table published by JCG, the current at a position approximately 7.6 M southeast from Himeshima Lighthouse was as follows.

February 19

18:06 Turn of tide

22:33 Strongest southerly current: about 1.1 kn

23:56 Southerly current: about 0.9 kn

February 20

01:47 Turn of tide

04:30 Strongest northerly current: about 1.1kn

06:58 Northerly current: about 0.5kn

07:54 Turn of tide

2.6.3 Observations by Crew members

According to the logbook of Ship A, at 24:00, February 19, the weather was cloudy, the wind was blowing from the east at a scale of 3 on the Beaufort scale, and visibility was about 7 km.

2.7 Information concerning Seawater Temperature and Survival Time

According to a literary source,*⁶ although there are differences among individuals, the survival time in water with a seawater temperature of 10°C for a person wearing ordinary clothing is less than six hours.

2.8 Characteristics of the Area

Sailing Directions for Seto Naikai (published in March, 2014) issued by JCG gives the following reference between NE of Hime Shima and E entrance to Kanmon Kaikyo.

- 1 Between Iwai Shima and Hime Shima, there is a case of a group of several fishing boats suddenly starting to move and hampering the sailing of large vessels. (omitted)
- 2 Route for Kanmon Kaikyo, Iyo Nada, Bungo Suido and Tokuyama Kudamatsu gather in the area near the E entrance to Suo Nada in the NE of Hime Shima. (the rest is omitted)

2.9 Safety Management of the Vessels

- (1) The Safety Management System (SMS) Manual prepared by Company A specified the following with regard to communication from the officer of the watch to the master.

The watch-keeping officer should notify the following to the master promptly, and take preventive actions immediately if necessary.

- 1) to 8) (omitted)
 - 9) When the officer of watch decides to notify due to other causes.
- (2) Master's Standing Order prepared by Company A specified the following with regard to reporting from the officer of the watch to the master.

The officer of watch should notify master immediately under the following circumstances.

- 1) to 7) (omitted)
 - 8) In any other emergency or situation in which he is in any doubt
 - 9) (omitted)
- (3) The SMS Manual prepared by Company A specified the following with

*⁶ Literary source: "SOLAS Training Manual" (Editorial supervisor: Safety Management and Seafarers Labour Division, Maritime Bureau, MLIT; Publication No. 27 of the Association for Accident Prevention Among Seafarers, August 2015)

regard to the handling of emergencies and handling of collisions.

Emergency response on board - Handling of Emergency Situation - Initial Report

When the ship is in any kind of emergency, including problems with personnel, the master must use the fastest and most defined method available to make an initial report to the MR/DP according to the “APP-4 Emergency Contact Flow Chart.” If MR/DP is absent, the master should be contacted by the next person in charge according to the “APP-4 Emergency Contact Flow Chart.”

- 1) When the ship is in an urgent situation, the master must take urgent action in a way that ensures human life and ship’s safety, and that lessens damage. Then he must make the initial report.
- 2) If the master should report to the administration of the relevant country or coastal state about an emergency situation, he must make the report according to the form of the “Shipboard Marine (Oil) Pollution Emergency Plan” after discussion with the company.
- 3) to 6) (omitted)

Response as emergency case - collision

- 1) In case of a collision accident, the master shall seek the safety of human lives, before everything else, to take first steps needed in due consideration of dangerousness of sinking.
- 2) Check any death or missing of crew.
- 3) to 12) (omitted)

2.10 Information concerning ARPA

According to a literary source,^{*7} the following points are noted with regard to ARPA vector displays.

With the true speed vector method, the course and speed of other vessels are immediately known. However, what the CPA will be and whether or not another vessel will enter the set CPA cannot be judged intuitively.

In general, the true speed vector is useful in ascertaining another vessel’s true movement (movement vis-à-vis the land, an island, or a waterway), while the

^{*7} Literary source: “*Denpa Keiki (Gotei Zohoban)*” (radio wave instruments [fifth revised and expanded edition]) (by Yoshio Nishitani; Seizando-Shoten Publishing Co., Ltd.; published March 18, 2002)

relative speed vector is useful in ascertaining CPA and TCPA.

(See Table 2.10)

Table 2.10 Comparison of Relative Speed Vector and True Speed Vector

	Relative speed vector	True speed vector
Will another vessel enter the set CPA? (Risk of collision)	Known immediately	Not known immediately
Other vessel's movement vis-à-vis land or waterway	Difficult to ascertain	Known immediately
Sea area of vector use (For reference)	Relatively distant areas from land, etc.	Narrow waterways Extremely close areas to land

2.11 International Standards of Bridge Watch

Item 4 and Item 4-1 of Section A-8-2 in Chapter 8 of mandatory standards in the 2010 MANILA amendment to the international convention on STCW* 8 designate the followings.

CAPTER VIII STANDARDS REGARDING WATCHKEEPING

Section A-VIII/1 (omitted)

Section A-VIII/2 Watchkeeping arrangements and principles to be observed

PART 1 – PART 3 (omitted)

PART 4 WATCHKEEPING AT SEA

Principles applying to watchkeeping generally

1 to 9 (omitted)

10 The master of every ship is bound to ensure that watchkeeping arrangements are adequate for maintaining a safe navigational watch. Under the master's general direction, the officers of the navigational watch are responsible for navigating the ship safety during their periods of duty, when they will be particularly concerned with avoiding collision and stranding.

*8 “STCW (The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers)” is an international convention on the standards of training, certification, and watchkeeping for crews established in 1978.

11 – 12 (omitted)

PART 4-1 PRINCIPLES TO BE OBSERVED IN KEEPING A NAVIGATIONAL WATCH

1 – 12 (omitted)

13 *The officer in charge of the navigational watch is the master's representative and is primarily responsible at all times for the safe navigation of the ship and for complying with the International Regulations for Preventing Collisions at Sea, 1972, as amended.*

Look-out

14 *A proper Look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended and shall serve the purpose of :*

- .1 maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant change in the operating environment ;*
- .2 fully appraising the situation and the risk of collision, stranding and other dangers to navigation, and*
- .3 detecting ships or aircraft in distress. Shipwrecked persons, wrecks, debris and other hazards to safe navigation.*

15 *The look-out must be able to give full attention to the keeping of a proper look-out and no other duties shall be undertaken or assigned which could interfere with that task.*

16 *The duties of the look-out and helmsperson are separate and the helmsperson shall not be considered to be look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out in daylight provided that on each such occasion :*

- .1 the situation has been carefully assessed and it has been established without doubt that it is safe to do so ;*
- .2 full account has been taken of all relevant factors including, but not limited to ;*
 - state of weather,*
 - visibility,*
 - traffic density,*

- *proximity of dangers to navigation, and*
- *the attention necessary when navigating in or near traffic separation schemes ; and*

.3 assistance is immediately available to be summoned to the bridge when any change in the situation so requires.

17 (omitted)

Watch arrangements

18 (omitted)

Taking over the watch

19 (omitted)

20 *The relieving officer shall ensure that the members of the relieving watch are fully capable of performing their duties, particularly as regards their adjustment to night vision. Relieving officers shall not take the watch until their vision is fully adjusted to the light conditions.*

21 *Prior to taking over the watch relieving officers shall satisfy themselves as to the ship's estimated or true position and confirm its intended track, course and speed, and UMS controls as appropriate and shall note any dangers to navigation expected to be encountered during their watch.*

22 (omitted)

23 *If at any time the officer in charge of the navigational watch is to be relieved when a manoeuvre or other action to avoid any hazard is taking place, the relief of that officer shall be deferred until such actions has been completed.*

Performing the navigational watch

24 - 31 (omitted)

32 *It is of special importance that at all times the officer in charge of the navigational watch ensures that a proper look-out is maintained. In a ship with a separate chart room the officer in charge of the navigational watch may visit the chart room, when essential, for a short period for the necessary performance of navigational duties, but shall first ensure that it is safe to do so and that proper look-out is maintained.*

33 - 34 (omitted)

35 *The officer in charge of the navigational watch shall bear in mind the necessary to comply at all times with the requirements in force of the International Convention for the safety of Life at Sea, (SOLAS) 1974. The*

officer of the navigational watch shall take into account ;

- .1 the need to station a person to steer the ship and to put the steering into manual control in good time to allow any potentially hazardous situation to be dealt with in a safe manner; and*
- .2 the with a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer in charge of the navigational watch is without assistance and has to break the continuity of the look-out in order to take emergency action.*

(the rest is omitted)

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Course of the Events

As described in 2.1, the situation was as follows.

(1) Ship A

- 1) It is probable that the Ship A departed Busan Port for Mishima-Kawanoe Port at around 09:55 on February 19, 2016 (local time).
- 2) It is highly probable that Ship A was navigating on a heading of approximately 101° and at a speed of approximately 15.5 kn between 23:30:05 and 23:41:41 on February 19, 2016.
- 3) It is highly probable that Ship A turned to starboard at around 23:41:45 and was navigating on a heading of approximately 110° and at a speed of approximately 15 kn between 23:43:17 and 23:46:05.
- 4) It is highly probable that Ship A turned to port at around 23:46:17 and was navigating on a heading of approximately 099° and at a speed of approximately 15 kn between 23:46:38 and 23:55:50.
- 5) It is probable that Ship A turned to port turn at around 23:56:04.

(2) Ship B

- 1) It is probable that Ship B was observed by Consort Skipper B to be leaving the fishing ground and proceeding north at around 22:00 on February 19, with regulation lights on, after finishing trawl-net fishing off the coast to the east of Oita Airport.
- 2) It is probable that Ship B capsized after colliding with Ship A and was

discovered by a navigating cargo ship near the Suo Nada Passage No. 6 Light Buoy at around 06:58 on February 20.

3.1.2 Date, Time and Location of the Accident Occurrence

As described in 2.1.1, 2.1.2(1) and 3.1.1, it is probable that the date and time of occurrence of the accident was at around 23:56 on February 19, 2016, when Ship A began her second turn to port, and that the location was near 33°44.1'N, 131°49.7'E (6.5 M on a true bearing of 087° from Himeshima Lighthouse), which was Ship A's location when she began her turn to port.

3.1.3 Injuries to Persons

As described in 2.1.2(2) and 2.2(2), it is probable that Skipper B died by drowning inside the capsized Ship B.

3.1.4 Damage to Vessels

As described in 2.3, the situation was as follows.

(1) Ship A

It is probable that the abrasions were caused on the bulbous bow.

(2) Ship B

It is highly probable that a hole and cracks were caused in her port-side center shell plating and that she capsized, becoming a total loss.

3.1.5 Situation of the Collision

As described in 2.1, 3.1.1, 3.1.2, and 3.1.4, it is probable that the bow of Ship A, which was turning to port, and the port-side center of Ship B collided.

3.1.6 Conditions of Ship A's Deviation

As described in 2.1, it is probable that Ship A began a turn to starboard at around 23:41:45, and that, when the ship's position was estimated based on the assumption of a direct course without a starboard turn from her heading and speed over the ground at 23:41:41, just prior to the turn, Ship A's estimated position would have been approximately 390 m (approximately 0.21 M) southwest from her actual position at around 23:55:50. (See Figure 3.1)

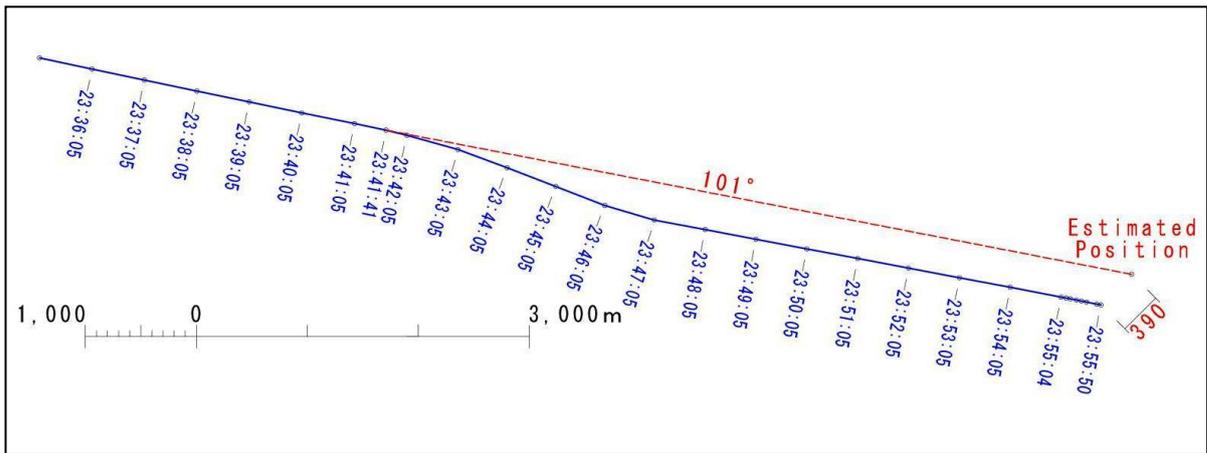


Figure 3.1 Ship A's Navigation Path and Estimated Position

3.1.7 Conditions at the Location of Ship B's Discovery

As described in 2.1.2(2) and 3.2.3 (appearing later in this report), it is somewhat likely that Ship B drifted in a west-northwest direction from the site of the accident due to the effects of the wind and current and was discovered near Suo Nada Passage No. 6 Light Buoy.

3.2 Causal Factors of the Accident

3.2.1 Situation of Crew Members

As described in 2.1.2(3) and 2.4, the situation was as follows.

(1) 2/O A

2/O A possessed a legally valid certificate of competence.

It is probable that he was in good health.

(2) Skipper B

Skipper B possessed a legally valid certificate of boat operator.

Although it is probable that he was in good health, Skipper B's state of health at the time of the accident could not be determined because he died in the accident.

Given that Skipper B was the sole crew member on Ship B and that he normally napped while dragging his net, it is somewhat likely that, at the time of the accident, which occurred approximately 45 hours after leaving port, Skipper B had not had enough rest, was growing increasingly tired.

3.2.2 Condition of the Vessels

As described in 2.5.3 and 2.5.4, the situation was as follows.

(1) Ship A

It is probable that there was no malfunction or failure with Ship A's hull, engine, or machineries.

(2) Ship B

The status of malfunction or failure of Ship B's hull, engine, and machineries could not be determined because Skipper B died in the accident.

3.2.3 Weather and Sea Conditions

As described in 2.6, it is probable that, at the time of the accident, the weather was cloudy, the wind was force three from the east, visibility was good, and the water temperature was 11°C.

It is probable that the current was flowing to the south; however, the direction of current later changed and Ship B was affected by a north current until discovered.

3.2.4 Conditions of Lookout and Ship Maneuvering

As described in 2.1, 2.5.3, 2.8, 3.1.1, 3.1.6, and 3.2.1, the situation was as follows.

(1) Ship A

1) It is probable that, after leaving Kanmon Passage with her regulation lights on, Ship A proceeded east to the west of Hime Shima under autopilot at a speed of approximately 15.5 kn with 3/O A and one A/B on watch.

2) It is probable that 3/O observed Ship B and Ship C by radar approaching from starboard ahead, saw the numerical values appearing on the radar screen, and understood that Ship B would pass Ship A's stern with a CPA of approximately 0.3 M and that Ship C would approach Ship A from ahead and cross from the starboard side to the port side. 3/O A set a starboard course with the intention of avoiding an approach with Ship C. After Ship C passed behind Ship A, 3/O A set the course to about 099°.

3) Given that 3/O A took a starboard course to avoid Ship C and that Ship A was proceeding straight ahead on a heading of about 099° from around 23:46:38, it is somewhat likely that Ship A was on a course to approach

Ship B's side, and that therefore the danger of a collision with Ship B existed.

- 4) It is probable that 2/O A came up to the bridge at around 23:47, stood behind the radar, took over the watch from 3/O A, extended the vector lengths, and found that the tip of Ship B's vector reached a point behind the tip of Ship A's vector, and that he therefore thought that Ship B would pass astern of Ship A and thus there was no danger of a collision with Ship B.
 - 5) It is probable that 3/O A was writing the navigation record, etc., after brightening the light of the chart table, with the chart table's curtain open, and then left the bridge at around 23:53.
 - 6) It is probable that 2/O A was looking backward and conversing with 3/O A until 3/O A left the bridge, and therefore, was not monitoring changes in the bearing of Ship B and was not keeping lookout on Ship B.
 - 7) It is probable that, at around 23:54, when 2/O A was informed that Ship B was approaching closely and also was asked permission to leave the bridge by A/B A, 2/O A thought there was no change in bearing and length of true vector, and therefore thought there was no danger of collision with Ship B. Also, as 2/O A allowed A/B A to leave the bridge, 2/O A became alone to keep watch in an area where ship traffic is congested.
 - 8) It is probable that when 2/O A was observed Ship B's lights at approximately 300 m to the starboard ahead at around 23:55 and realized the danger of collision.
 - 9) It is probable that 2/O A flashed Ship B about ten times using the daylight signaling lamp installed on the front starboard side, but because there was no change in Ship B's course, he went to the steering stand, switched to hand steering, and set the rudder hard to port.
- (2) Ship B
- 1) Given that, when returning to port, Ship B normally proceeded north from the fishing ground for a period of time to avoid approaching vessels navigating along the recommended passage in western Iyo Nada and then changed course to the north-northwest around the time that the Tokuyama Passage No. 1 Light Buoy and the south lighthouse on the Tsukiji East Breakwater of Mitajiri-Nakanoseki Port appeared to be on a straight line, it is somewhat likely that Ship B was proceeding

north-northwest at the time of the accident.

- 2) Given that, at the time of the onsite investigation, Ship B's had her rudder plate in the position of hard to starboard, her main engine's throttle lever in the position of "low speed," and her clutch lever in the position of "neutral," it is probable that Skipper B did not notice of Ship A until Ship A come close to Ship B and action of Skipper B to avoid collision.
- 3) It is somewhat likely that Skipper B did not notice Ship A until Ship A had come close to Ship B, because Skipper B had accumulated fatigue; however, it was not possible to determine the situation of lookout as Skipper B was killed in this accident.

3.2.5 Analysis of Navigation rules

Given that, as described in 2.5.4(2) and 3.2.4, 2/O A did not keep lookout on Ship B, Skipper B died in the accident, and Ship B's track and other data from the time of the accident were not recorded on Ship B's GPS plotter, the navigation rules applicable to the accident could not be determined.

3.2.6 Analysis of the Accident Occurrence

As described in 3.1.1, 3.1.7, 3.2.3 and 3.2.4, the situation was as follows.

(1) Ship A

- 1) It is probable that, with her regulation lights on, Ship A proceeded east to the west of Hime Shima under autopilot at a speed of approximately 15.5 kn with 3/O A and one A/B on watch.
- 2) Given that 3/O A took a starboard course to avoid Ship C and that Ship A was proceeding straight ahead on a heading of about 099°, it is somewhat likely that Ship A was on a course to approach Ship B's side, and that therefore the danger of a collision with Ship B existed.
- 3) It is probable that after 2/O A came up to the bridge at around 23:47, and took over the watch from 3/O A, he extended the vector lengths and found that the tip of Ship B's vector reached a point behind the tip of Ship A's vector, and that he therefore thought that Ship B would pass astern of Ship A and thus there was no danger of a collision with Ship B.
- 4) It is probable that 2/O A was looking backward and conversing with 3/O A until 3/O A left the bridge, and therefore, was not monitoring changes in

the bearing and other movements of Ship B and was not keeping lookout on Ship B.

- 5) It is probable that, at around 23:54, when 2/O A thought there was no danger of collision with B, and 2/O A allow A/B A to leave the bridge, 2/O A became alone to keep watch in an area where ship traffic is congested.
- 6) It is probable that, when 2/O A observed Ship B's lights at approximately 300 m to the starboard at around 23:55 and realized the danger of collision, then he went to the steering stand, switched to hand steering, and set the rudder hard to port.
- 7) It is probable that Ship A collided with Ship B when she began her turn to port.

(2) Ship B

- 1) It is probable that Ship B was observed by Consort Skipper B proceeding north, with regulation lights on.
- 2) It is somewhat likely that Ship B was proceeding to the north-northwest at the time of the accident.
- 3) Given that, at the time of the onsite investigation, Ship B's had her rudder plate in the position of hard to starboard, her main engine's throttle lever in the position of "low speed," and her clutch lever in the position of "neutral," it is probable that Skipper B did not notice Ship A until Ship A had come close to Ship B and did not take action to avoid collision.
- 4) It is somewhat likely that, after colliding with A, Ship B capsized and drifted to the west-northwest.

3.3 Analysis of Rescue and Measures to Alleviate Damage

As described in 2.1.2, 2.6, 2.8, 3.1.2, and 3.1.3, the situation was as follows.

- (1) It is probable that the SMS Manual prepared by Company A specified that the officer of the watch shall immediately report to the master whenever he feels there is a need, and, likewise, that the masters' instructions prepared by Company A specified the officer of the watch shall immediately report to the master whenever an emergency situation or uncertain situation arises.
- (2) Given that, after sensing the danger of collision and setting the rudder hard to port, 2/O A did not believe that Ship A had collided with Ship B despite being unable to observe Ship B's lights, it is probable that 2/O A

contacted Master A after approximately 30 minutes had elapsed since the accident's occurrence.

- (3) It is probable that Master A continued toward his destination when, after coming to the bridge, hearing 2/O A retell what happened, and receiving a vague explanation stating that 2/O A thought that no collision with Ship B had occurred, he went to the bow to look for signs of a collision but did not find any.
- (4) Given that Skipper B was recovered from the capsized ship at around 08:25 on February 20 by a patrol boat that had received report from a cargo ship navigating near the Suo Nada Passage No. 6 Light Buoy, it is probable that Skipper B was recovered after more than eight hours had elapsed from the time of the accident.
- (5) Given that the average seawater temperature near the site of the accident on February 19 was approximately 11°C and that, although there are differences among individuals, the survival time in water with a seawater temperature of approximately 10°C is less than six hours, it is somewhat likely that Skipper B would have survived if rescue had been conducted quickly.

3.4 Analysis on Ship A's Navigational Watch

- (1) As described in 2.1.2, 3.1.1, 3.2.4 and 3.2.6, it is probable that navigational watch of Ship A was as follows.
 - 1) 3/O A, after avoiding Ship C, set a heading to about 099° from around 23:46:38. 2/O A came up to the bridge at around 23:47 and, after taking over the watch from 3/O A, watching the true speed vector, thought there was no danger of a collision with Ship B.
 - 2) 3/O A was writing the navigation record, etc., after brightening the light of the chart table, with the chart table's curtain open, and then 2/O A was looking backward and conversing with 3/O A until 3/O A left the bridge at around 23:53
 - 3) At around 23:54, when 2/O A was informed that Ship B was approaching closely and also was asked permission to leave the bridge by A/B A, 2/O A thought there was no change in bearing and length of true speed vector, and therefore, thinking there was no danger of collision with Ship B, allowed A/B A to leave the bridge.

- 4) 2/O A observed Ship B's lights at approximately 300 m to the starboard ahead at around 23:55 and realized the danger of collision, switched to hand steering, and set the rudder hard to port, and Ship A turned to port turn at around 23:56:04.
- (2) As described in 2.11, STCW convention regulates for navigational watch as follows.
- 1) If at any time the officer in charge of the navigational watch is to be relieved when a manoeuvre or other action to avoid any hazard is taking place, the relief of that officer shall be deferred until such action has been completed.
 - 2) The relieving officer shall ensure that the members of the relieving watch are fully capable of performing their duties, particularly as regards their adjustment to night vision. Relieving officers shall not take the watch until their vision is fully adjusted to the light conditions.
 - 3) A proper look-out shall be maintained at all times in compliance with rule 5 of the International Regulations for Preventing Collisions at Sea, 1972, as amended and shall serve the purpose of maintaining a continuous state of vigilance by sight and hearing as well as by all other available means, with regard to any significant change in the operating environment.
 - 4) The duties of the look-out and helmsperson are separate and the helmsperson shall not be considered to be the look-out while steering, except in small ships where an unobstructed all-round view is provided at the steering position and there is no impairment of night vision or other impediment to the keeping of a proper look-out in daylight provided.
 - 5) With a ship under automatic steering it is highly dangerous to allow a situation to develop to the point where the officer in charge of the navigational watch is without assistance and has to break the continuity of the look-out in order to take emergency action.

Therefore, given the situation in which watch personnel took over watch immediately after altering course for avoiding another vessel, brightened the light of the chart table with the chart table's curtain open, and did not keep look-out and looked backward while conversing, it is probable that the watch of Ship A was not in accordance with the requirements of the STCW convention.

4 CONCLUSIONS

4.1 Probable Causes

It is probable that, off the eastern coast of Hime Shima at night, while Ship A was proceeding east and Ship B was proceeding north-northwest, the Ship A and Ship B collided because 2/O A was not keeping lookout on Ship B because he thought there was no danger of a collision with Ship B, and because Skipper B did not notice of Ship A until Ship A had come close to Ship B.

It is probable that 2/O A thought that there was no danger of colliding with Ship B because, when he extended the radar's true speed vectors, he found that the tip of Ship B's vector reached a point behind the tip of Ship A's vector.

It is somewhat likely that Skipper B did not notice Ship A until Ship A had come close to Ship B because Skipper B had accumulated fatigue; however, it was not possible to determine the situation of lookout as Skipper B was killed in this accident.

4.2 Other Identified Safety Issues

4.2.1 Items concerning Rescue and Measures to Alleviate Damage

It is probable that Skipper B fell into the water when Ship B capsized, and it is somewhat likely that Skipper B could have been saved in a living state if a search and rescue operation had been started earlier.

Therefore, 2/O A needed to follow the SMS manual and Master's Standing Order and call Master A immediately, and use RADAR for search of Ship B, and when he was unable to observe Ship B's lights after turning the rudder hard to port as he realized the danger of collision, Master A needed to report immediately to coastal state.

4.2.2 Other Items

From below, it is also probable that the watch of Ship A was not in accordance with the requirements of the STCW convention.

- (1) 3/O A took over the watch without confirming danger of collision with Ship B after avoiding Ship C.
- (2) Ship A kept the chart table's curtain open at night when 3/O A was writing the navigation record, etc., and 2/O A was not in a situation to perform appropriate lookout.

- (3) 2/O A allowed A/B A to leave the bridge, and 2/O A became alone to keep watch in an area where ship traffic is congested.

5 SAFETY ACTIONS

It is probable that, off the eastern coast of Hime Shima at night, as Ship A was proceeding east and Ship B was proceeding north-northwest, Ship A and Ship B collided because 2/O A did not keep lookout on Ship B, and Skipper B did not notice Ship A until Ship A had come close to Ship B.

It is probable that 2/O A thought that there was no danger of collision with Ship B using true speed vector, was not monitoring changes in the bearing of Ship B, and was not keeping proper lookout on Ship B.

It is also probable that the watch of Ship A was not in accordance with the requirements of the STCW convention.

Accordingly, in order to prevent recurrence of the accident, Company A should instruct all crew members on board the operating ship to thoroughly comply with “STANDARDS REGARDING WATCHKEEPING “of the mandatory regulation of the STCW convention, including keeping appropriate lookout.

It is probable that Skipper B fell into the water when Ship B capsized, and it is somewhat likely that Skipper B could have been saved in a living state if a search and rescue operation had started earlier, and therefore, 2/O A needed to follow the SMS manual and Master’s Standing Order and call Master A immediately, and use RADAR for search of Ship B, and when he was unable to observe Vessel B’s lights after turning the rudder hard to port as he realized the danger of collision, Master A needed to report immediately to coastal state.

Accordingly, Company A should instruct all crew members on board the operating ship to thoroughly comply with the Safety Management Manual and Master’s Standing Order.

5.1 Safety Actions Taken

After the accident, Company A directed the vessels it manages to execute the following items.

- (1) Officers of the watch shall keep appropriate lookout and give their full attention to maintaining a complete grasp of the danger of collision.

- (2) Officers of the watch shall not leave the bridge during navigation.
- (3) Officers of the watch shall observe watch-changing procedures.
- (4) Officers of the watch shall observe the International Regulations for Preventing Collisions at Sea, and shall take a starboard course and make acoustic signals when they see a vessel ahead of the bow.
- (5) Officers of the watch shall execute appropriate rescue measures without hesitation whenever it is thought that a human life may be at risk.
- (6) Officers of the watch shall immediately report all emergencies, regardless of their nature, to the company and the safety manager.
- (7) In the event that an abnormal situation occurs during navigation, officers of the watch shall stop VDR recording and back up data.

5.2 Safety Actions Required

In order to prevent recurrence of the accident and to reduce damage, Company A should take the following measures.

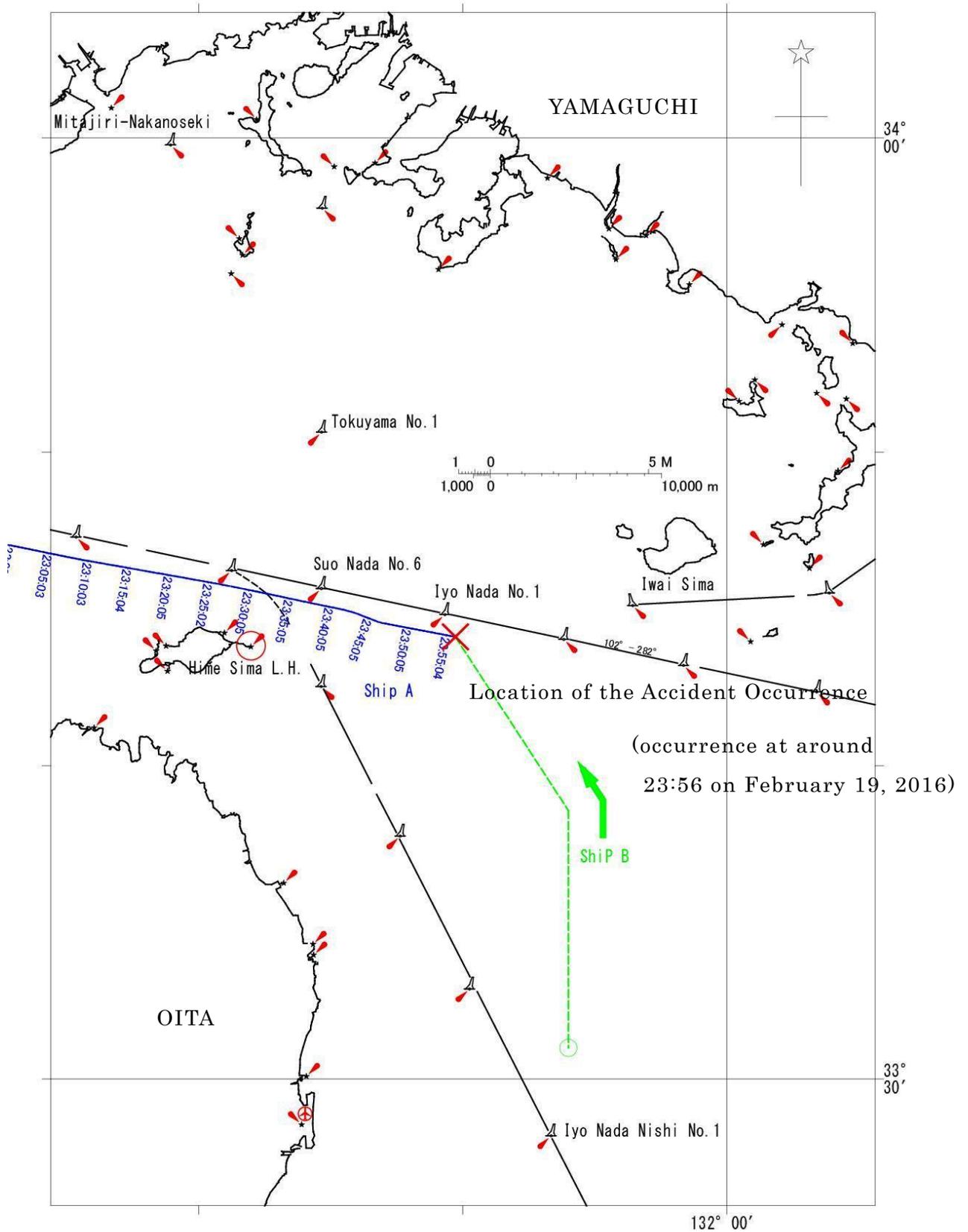
Company A is required to instruct all crew members on board operating ships to thoroughly comply with “STANDARDS REGARDING WATCHKEEPING” of the mandatory regulations of the STCW convention, the Safety Management Manual and Master’s Standing Order, including keeping appropriate lookout.

6 SAFETY RECOMMENDATIONS

In view of the result of this accident investigation, the Japan Transport Safety Board recommends that KOREA SHIPMANAGERS CO., LTD. should take the following measures.

Instruct all crews on board operating ships to thoroughly comply with “STANDARDS REGARDING WATCHKEEPING” of the mandatory regulations of the STCW convention, the Safety Management Manual and Master’s Standing Order, including keeping appropriate lookout.

Figure 1 Outline Map of the Course of the Accident Events



*Map was prepared based on Ship A's AIS record and the statements of Ship B's family and Consort Skipper B.

Figure 2 Enlarged Map of Ship A's Path (1)

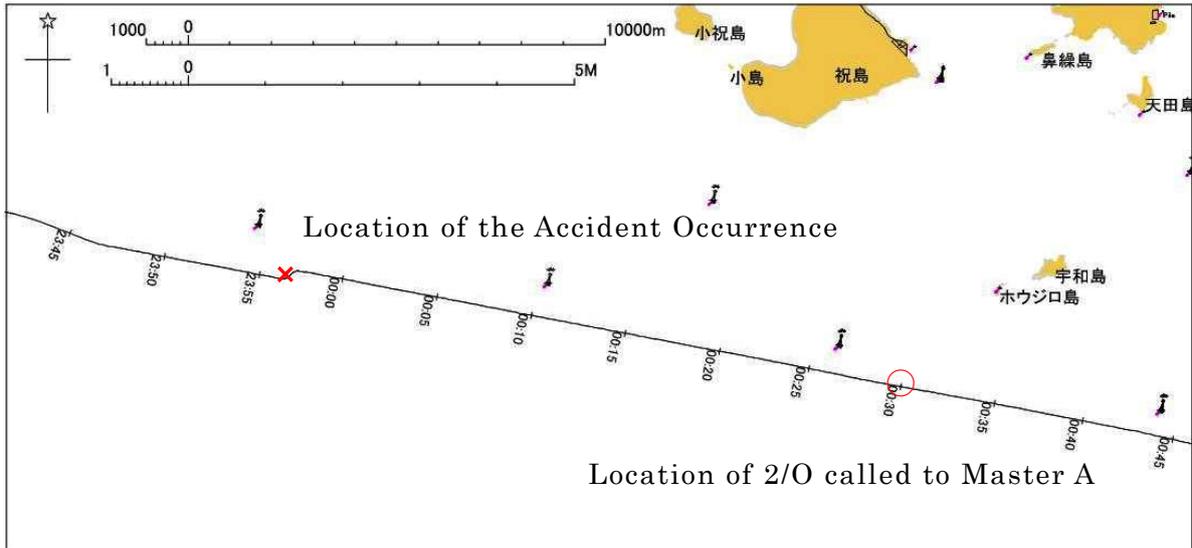


Figure 3 Enlarged Map of Ship A's Path (2)

