

MA2024-5

**MARINE ACCIDENT
INVESTIGATION REPORT**

May 30, 2024



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

TAKEDA Nobuo
Chairperson
Japan Transport Safety Board

Note:

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

《Reference》

The terms used to describe the results of the analysis in "3. ANALYSIS" of this report are as follows.

- i) In case of being able to determine, the term "certain" or "certainly" is used.
- ii) In case of being unable to determine but being almost certain, the term "highly probable" or "most likely" is used.
- iii) In case of higher possibility, the term "probable" or "more likely" is used.
- iv) In a case that there is a possibility, the term "likely" or "possible" is used.

MARINE ACCIDENT INVESTIGATION REPORT

Vessel Type and Name : Cargo Ship, GUO XING 1

IMO Number : 9368118

Gross tonnage : 1,989 tons

Vessel Type and Name : Fishing Vessel, TOMI MARU No.8

Vessel Number : 132236

Gross tonnage : 138 tons

Accident Type : Collision

Date and Time : Around 22:10, February 29, 2020,
(Local Time, UTC+9 hours)

Location : Off the east coast of Nakayamazaki, Rokkasho village, Aomori
Prefecture

Around 098° true bearing 6.6 nautical miles from the Shiranuka
Port Yakeyama No.1 east breakwater lighthouse
(Approximately 41°05.2'N, 141°32.5'E)

May 8, 2024

Adopted by the Japan Transport Safety Board

Chairperson TAKEDA Nobuo

Member ITO Hiroyasu

Member UENO Michio

Member SOUDA Hisako

Member OKAMOTO Makiko

1. PROSESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

The cargo ship GUO XING 1, with the master and 13 crew members on board, was heading north toward Dangjin, Republic of Korea, and the fishing vessel TOMI MARU No. 8, with the master and 14 crew members on board, was heading south toward Hachinohe Port, Aomori Prefecture. At around 10:00 p.m. on February 29, 2020, the two vessels collided at east of Nakayamazaki, Rokkasho Village, Aomori Prefecture.

GUO XING 1 was flooded and sunk with 13 crew members missing. The TOMI MARU No.8 was damaged and dented with holes on the bow, and dented and scratched on the bulbous bow and shell plating of port side bow. The Chief fisherman was also injured.

1.2 Outline of the Accident Investigation

1.2.1 Setup of the Investigation

The Japan Transport Safety Board (JTSB) appointed an investigator in charge and another investigator to investigate this accident on March 1, 2020.

1.2.2 Collection of Evidence

March 2 and 3, 2020 : Interview and site investigation

March 22 and May 11, 2021 : Collection of questionnaire

April 3, 9, July 16, 30, 2021, March 24, May 12, November 12, 14, 26, December 19, 2022,

March 6, 8, 2023 : Interview

1.2.3 Interim Report

On August 4, 2021, the JTSB submitted the interim investigation report to the Minister of Land, Infrastructure, Transport and Tourism based on the facts found up to that date and made it available to the public.

1.2.4 Opinions of Parties Relevant to the Cause

JTSB is planning to interview from Parties Relevant to the Cause.

1.2.5 Comments from Flag State

Comments on the draft report were invited from the flag state of GUO XING 1 and relevant substantially interested state.

2. FACTUAL INFORMATION

2.1 Events leading to the Accident

2.1.1 The navigation track according to Automatic Identification System (AIS) and Global Positioning System (GPS).

According to the “Record of Automatic Identification System (AIS)^{*1} information

*1 An Automatic Identification System (AIS) is a device that each vessel uses to automatically transmit and receive information such as vessel

received by a private information company” (hereinafter referred to as “AIS record”), the ship’s position, course over the ground, heading and speed over the ground of the GUO XING 1 (hereinafter referred to as “Vessel A”) from around 21:00:22 to around 22:31:41 on February 29, 2020 were as shown in Table 1.

With regard to the AIS record, the position of Vessel A is based on GPS antenna located on the navigation bridge of Vessel A (approximately 71 m from the bow, 16 m from the stern, 7 m from the port side, and 7 m from the starboard side). The indication of the course over the ground and heading is true bearing (hereinafter the same). The time is shown the Japan Standard Time (JST: UTC + 9 hours) converted by the Coordinated Universal Time (UTC).

The AIS records of Vessel A were not recorded after 22:31:41, February 29, 2020, Japan Standard Time (ship's position: 41°05'14.3"N, 141°31'50.7"E).

identification code, ship type, name, position, course, speed, destination, and conditions of navigation, and to exchange information with other vessels or land-based navigation aids.

Table 1. AIS records for Vessel A (excerpts)

| Time (HH: MM: SS) | Position | | Course Over the Ground (°) | Heading (°) | Speed Over the Ground Knots (kn) |
|----------------------|-------------------------|--------------------------|-------------------------------------|----------------|--|
| | Latitude (N) (°-′-″) | Longitude (E) (°-′-″) | | | |
| 21:00:22 | 40-56-24.5 | 141-31-49.4 | 002.4 | 006 | 8.1 |
| 21:05:22 | 40-57-04.8 | 141-31-52.9 | 356.3 | 007 | 8.0 |
| 21:10:02 | 40-57-42.3 | 141-31-56.5 | 002.1 | 008 | 7.8 |
| 21:15:22 | 40-58-24.8 | 141-32-02.1 | 010.6 | 007 | 7.9 |
| 21:20:02 | 40-59-01.6 | 141-32-07.3 | 011.8 | 006 | 8.0 |
| 21:25:00 | 40-59-40.3 | 141-32-11.4 | 003.1 | 006 | 7.6 |
| 21:30:22 | 41-00-22.2 | 141-32-12.1 | 357.8 | 002 | 7.7 |
| 21:35:02 | 41-00-57.9 | 141-32-10.3 | 354.3 | 003 | 8.0 |
| 21:40:01 | 41-01-36.9 | 141-32-07.0 | 354.6 | 006 | 7.8 |
| 21:45:02 | 41-02-16.0 | 141-32-02.2 | 343.4 | 006 | 7.9 |
| 21:50:02 | 41-02-54.5 | 141-32-01.4 | 011.1 | 008 | 7.6 |
| 21:52:50 | 41-03-15.6 | 141-32-03.2 | 014.7 | 019 | 7.5 |
| 21:55:01 | 41-03-31.7 | 141-32-07.8 | 012.3 | 016 | 7.8 |
| 21:58:31 | 41-03-57.4 | 141-32-16.0 | 023.5 | 016 | 7.2 |
| 22:00:00 | 41-04-08.1 | 141-32-20.1 | 023.7 | 015 | 7.7 |
| 22:01:00 | 41-04-15.2 | 141-32-23.0 | 022.3 | 018 | 7.3 |
| 22:02:12 | 41-04-23.6 | 141-32-26.3 | 026.3 | 020 | 7.2 |
| 22:03:00 | 41-04-28.9 | 141-32-29.3 | 021.5 | 024 | 7.4 |
| 22:04:00 | 41-04-35.4 | 141-32-33.5 | 020.1 | 023 | 7.4 |
| 22:05:00 | 41-04-41.8 | 141-32-37.9 | 033.0 | 023 | 6.9 |
| 22:06:00 | 41-04-47.8 | 141-32-42.6 | 035.5 | 026 | 7.0 |
| 22:07:00 | 41-04-54.3 | 141-32-46.3 | 024.3 | 018 | 7.5 |
| 22:07:10 | 41-04-55.5 | 141-32-46.5 | 356.8 | 015 | 6.8 |
| 22:07:15 | 41-04-56.2 | 141-32-46.6 | 353.4 | 013 | 6.9 |
| 22:07:22 | 41-04-57.0 | 141-32-46.5 | 358.7 | 010 | 6.8 |
| 22:07:25 | 41-04-57.3 | 141-32-46.4 | 346.0 | 009 | 7.3 |
| 22:07:28 | 41-04-57.7 | 141-32-46.3 | 351.1 | 008 | 7.0 |
| 22:07:34 | 41-04-58.4 | 141-32-46.1 | 348.3 | 006 | 6.9 |
| 22:07:40 | 41-04-59.0 | 141-32-45.7 | 337.0 | 006 | 6.8 |
| 22:07:48 | 41-04-59.9 | 141-32-45.3 | 335.8 | 005 | 7.2 |
| 22:07:55 | 41-05-00.6 | 141-32-44.7 | 320.1 | 004 | 7.1 |

| | | | | | |
|----------|------------|-------------|-------|-----|-----|
| 22:08:00 | 41-05-01.1 | 141-32-44.3 | 322.3 | 004 | 7.5 |
| 22:08:10 | 41-05-02.1 | 141-32-43.4 | 329.3 | 005 | 7.2 |
| 22:08:22 | 41-05-03.2 | 141-32-42.3 | 328.3 | 006 | 7.1 |
| 22:08:40 | 41-05-05.0 | 141-32-40.5 | 312.3 | 006 | 7.3 |
| 22:08:52 | 41-05-06.1 | 141-32-39.2 | 318.3 | 006 | 7.6 |
| 22:09:00 | 41-05-06.8 | 141-32-38.3 | 317.6 | 006 | 7.6 |
| 22:09:10 | 41-05-07.7 | 141-32-37.0 | 313.7 | 004 | 7.7 |
| 22:09:22 | 41-05-08.6 | 141-32-35.5 | 304.9 | 000 | 7.8 |
| 22:09:32 | 41-05-09.4 | 141-32-34.1 | 300.9 | 358 | 7.8 |
| 22:09:40 | 41-05-09.9 | 141-32-32.9 | 302.0 | 354 | 7.8 |
| 22:09:44 | 41-05-10.2 | 141-32-32.3 | 293.8 | 352 | 7.6 |
| 22:09:46 | 41-05-10.3 | 141-32-32.0 | 297.6 | 351 | 7.9 |
| 22:09:52 | 41-05-10.6 | 141-32-31.0 | 290.8 | 348 | 7.7 |
| 22:09:58 | 41-05-10.8 | 141-32-30.1 | 288.5 | 343 | 7.1 |
| 22:10:00 | 41-05-10.9 | 141-32-29.8 | 297.1 | 340 | 7.5 |
| 22:10:04 | 41-05-11.0 | 141-32-29.2 | 278.4 | 335 | 7.4 |
| 22:10:08 | 41-05-11.1 | 141-32-28.5 | 278.3 | 331 | 7.3 |
| 22:10:10 | 41-05-11.1 | 141-32-28.2 | 270.8 | 329 | 6.9 |
| 22:10:14 | 41-05-11.2 | 141-32-27.6 | 276.7 | 324 | 7.2 |
| 22:10:18 | 41-05-11.1 | 141-32-27.0 | 261.7 | 320 | 7.1 |
| 22:10:22 | 41-05-11.1 | 141-32-26.3 | 264.0 | 316 | 7.5 |
| 22:10:24 | 41-05-11.1 | 141-32-26.0 | 258.6 | 314 | 7.2 |
| 22:10:28 | 41-05-11.0 | 141-32-25.3 | 258.3 | 311 | 7.0 |
| 22:10:35 | 41-05-10.8 | 141-32-24.3 | 253.5 | 304 | 7.3 |
| 22:10:38 | 41-05-10.6 | 141-32-23.8 | 247.5 | 300 | 7.3 |
| 22:10:44 | 41-05-10.3 | 141-32-23.0 | 240.0 | 295 | 6.7 |
| 22:10:48 | 41-05-10.1 | 141-32-22.5 | 237.5 | 291 | 6.6 |
| 22:10:52 | 41-05-09.9 | 141-32-22.0 | 233.2 | 288 | 6.6 |
| 22:10:54 | 41-05-09.7 | 141-32-21.7 | 238.1 | 287 | 6.5 |
| 22:11:01 | 41-05-09.3 | 141-32-21.0 | 227.6 | 283 | 6.1 |
| 22:12:01 | 41-05-04.8 | 141-32-17.0 | 209.8 | 248 | 5.3 |
| 22:13:01 | 41-05-00.9 | 141-32-16.1 | 199.2 | 228 | 3.6 |
| 22:13:11 | 41-05-00.3 | 141-32-16.1 | 161.3 | 226 | 2.6 |
| 22:14:11 | 41-04-57.8 | 141-32-16.1 | 168.1 | 219 | 2.4 |
| 22:15:11 | 41-04-56.0 | 141-32-15.9 | 203.1 | 208 | 1.9 |
| 22:16:11 | 41-04-54.8 | 141-32-15.7 | 188.0 | 200 | 1.6 |

| | | | | | |
|----------|------------|-------------|-------|-----|-----|
| 22:17:11 | 41-04-53.7 | 141-32-15.7 | 175.9 | 191 | 1.6 |
| 22:17:38 | 41-04-53.0 | 141-32-15.9 | 162.9 | 178 | 1.5 |
| 22:18:11 | 41-04-52.2 | 141-32-16.6 | 139.7 | 156 | 1.8 |
| 22:18:38 | 41-04-51.7 | 141-32-17.6 | 117.8 | 137 | 1.4 |
| 22:19:11 | 41-04-51.6 | 141-32-18.9 | 076.3 | 111 | 2.1 |
| 22:19:38 | 41-04-52.2 | 141-32-19.8 | 015.5 | 096 | 2.0 |
| 22:20:11 | 41-04-53.3 | 141-32-20.5 | 059.8 | 092 | 2.5 |
| 22:21:11 | 41-04-55.9 | 141-32-21.6 | 005.2 | 081 | 3.2 |
| 22:22:11 | 41-04-59.2 | 141-32-22.2 | 041.1 | 063 | 4.2 |
| 22:23:12 | 41-05-03.0 | 141-32-21.8 | 339.0 | 048 | 3.8 |
| 22:24:12 | 41-05-07.0 | 141-32-19.9 | 313.5 | 014 | 4.5 |
| 22:25:12 | 41-05-10.1 | 141-32-15.6 | 336.4 | 024 | 4.3 |
| 22:25:38 | 41-05-11.6 | 141-32-14.1 | 329.2 | 031 | 3.9 |
| 22:26:11 | 41-05-13.8 | 141-32-12.8 | 343.9 | 030 | 4.6 |
| 22:27:11 | 41-05-17.8 | 141-32-10.1 | 327.0 | 356 | 4.5 |
| 22:28:11 | 41-05-19.9 | 141-32-05.2 | 273.3 | 314 | 4.2 |
| 22:29:11 | 41-05-19.9 | 141-31-59.5 | 256.4 | 272 | 4.1 |
| 22:30:12 | 41-05-17.9 | 141-31-55.4 | 242.5 | 254 | 4.3 |
| 22:31:12 | 41-05-15.5 | 141-31-52.2 | 211.4 | 248 | 3.3 |
| 22:31:41 | 41-05-14.3 | 141-31-50.7 | 223.5 | 244 | 4.2 |

In addition to the above, according to the GPS position (hereinafter referred to as the “GPS record”) recorded on the radar plotter of the TOMI MARU No.8 (hereinafter referred to as the “Vessel B”), the ship’s position of Vessel B between 19:30:18 and 22:33:54 on February 29, 2020 were as shown in Table 2.

The ship’s position is GPS antenna position located on the navigation bridge of Vessel B, and the time is shown the Japan Standard Time converted by the recorded the Coordinated Universal Time (UTC).

Table 2 GPS records for vessel B (excerpts)

| No. | Time | Ship’s position | |
|-----|--------------|-------------------------|--------------------------|
| | (HH: MM: SS) | Latitude (N) (°-′-″) | Longitude (E) (°-′-″) |
| 1 | 19:30:18 | 41-37-00.8 | 141-31-07.9 |
| 2 | 20:25:46 | 41-25-46.3 | 141-32-38.9 |
| 3 | 22:00:03 | 41-07-09.8 | 141-32-33.5 |
| 4 | 22:01:41 | 41-06-50.3 | 141-32-32.7 |
| 5 | 22:02:29 | 41-06-40.7 | 141-32-32.4 |
| 6 | 22:03:18 | 41-06-31.1 | 141-32-31.9 |
| 7 | 22:04:06 | 41-06-21.6 | 141-32-31.4 |
| 8 | 22:04:57 | 41-06-11.5 | 141-32-31.0 |
| 9 | 22:05:46 | 41-06-01.7 | 141-32-30.7 |
| 10 | 22:06:36 | 41-05-51.8 | 141-32-30.3 |
| 11 | 22:07:25 | 41-05-42.0 | 141-32-29.9 |
| 12 | 22:08:14 | 41-05-32.3 | 141-32-29.5 |
| 13 | 22:09:04 | 41-05-22.4 | 141-32-29.0 |
| 14 | 22:09:53 | 41-05-12.8 | 141-32-28.4 |
| 15 | 22:10:42 | 41-05-10.2 | 141-32-22.4 |
| 16 | 22:11:31 | 41-05-06.4 | 141-32-17.8 |
| 17 | 22:12:22 | 41-05-02.2 | 141-32-16.5 |
| 18 | 22:13:10 | 41-05-00.7 | 141-32-15.7 |
| 19 | 22:14:01 | 41-04-59.9 | 141-32-13.8 |
| 20 | 22:14:50 | 41-04-59.9 | 141-32-12.4 |
| 21 | 22:15:41 | 41-05-00.4 | 141-32-11.5 |
| 22 | 22:16:30 | 41-05-00.8 | 141-32-10.5 |
| 23 | 22:17:20 | 41-05-01.0 | 141-32-09.3 |
| 24 | 22:18:10 | 41-05-01.1 | 141-32-08.2 |

| | | | |
|----|----------|------------|-------------|
| 25 | 22:18:59 | 41-05-01.2 | 141-32-06.9 |
| 26 | 22:19:48 | 41-05-01.4 | 141-32-06.0 |
| 27 | 22:20:37 | 41-05-01.6 | 141-32-04.9 |
| 28 | 22:21:28 | 41-05-01.8 | 141-32-03.7 |
| 29 | 22:22:19 | 41-05-02.0 | 141-32-02.6 |
| 30 | 22:23:07 | 41-05-02.1 | 141-32-01.6 |
| 31 | 22:23:55 | 41-05-02.2 | 141-32-00.5 |
| 32 | 22:24:44 | 41-05-02.6 | 141-31-59.3 |
| 33 | 22:25:35 | 41-05-02.9 | 141-31-58.2 |
| 34 | 22:26:28 | 41-05-03.2 | 141-31-57.2 |
| 35 | 22:27:17 | 41-05-03.6 | 141-31-56.2 |
| 36 | 22:28:05 | 41-05-03.8 | 141-31-55.2 |
| 37 | 22:28:53 | 41-05-04.0 | 141-31-54.3 |
| 38 | 22:29:43 | 41-05-04.3 | 141-31-53.3 |
| 39 | 22:30:32 | 41-05-04.6 | 141-31-52.1 |
| 40 | 22:31:24 | 41-05-04.9 | 141-31-51.0 |
| 41 | 22:32:15 | 41-05-05.1 | 141-31-49.9 |
| 42 | 22:33:04 | 41-05-05.4 | 141-31-48.7 |
| 43 | 22:33:54 | 41-05-05.6 | 141-32-13.8 |

2.1.2 Events Leading to the Accident according to Statements of Crew Members

With regard to the process of the marine accident occurrence, the crews of each vessel who sole serving officer of Vessel A (hereinafter referred to as "Officer A1"), crews of Vessel B, crews of vessel which was sailing at around 0.5 mile (M) forward port side of Vessel B (hereinafter referred to as "Vessel C"), crews of vessel which was sailing 2M aft starboard side of Vessel B (hereinafter referred to as "Vessel D") and crews of vessel which was sailing 4M forward of Vessel B (hereinafter referred to as "Vessel E") have stated as follows.

(1) Statement of the Officer A1

For Vessel A, the master (hereinafter referred to as "Master A") (Nationality: People's Republic of China), Officer A1 (Nationality: Socialist Republic of Viet Nam) and 12 crews (Nationality: 6 People's Republic of China, 5 Socialist Republic of Viet Nam, 1 Republic of the Philippines) were on board. Vessel A has loaded the steel material scrap and she was departure from Hachinohe Port, Quay B, Hattaro, toward Dangjin, Republic of Korea at around 17:45 (Japan Standard Time, hereinafter as same) on February 29, 2020.

After the departure from Hachinohe Port, the Officer A1 was navigational watch on duty, and Vessel A was heading toward north. The Officer A1 had confirmed that Vessel A was sailing on the course line under the planning on 20:45 in order to take over the navigational watch to next watch Officer (hereinafter referred to as "Officer A2"), and he confirmed the condition around the Vessel A by the radar, and recorded of the ship's position on 20:50 on the Logbook and chart. Then, Officer A1 had taken over the navigational watch to the Officer A2. When Officer A1 took over the navigational watch, the radar positioned on the starboard side of the steering stand (hereinafter referred to as "Starboard side radar") was set to 6M range, off-center*2 and course up*3 with an echo trail*4 of approximately 3 minutes, and the radar located on the port side of the steering stand (hereinafter referred to as the "Port side radar") was set stand-by. Automatic Rader Plotting Aids (ARPA)*5 of the starboard side radar had not been used since the acquisition targets sometimes disappeared.

Also, the ship speed was 8.5kn at that time of taking over the navigational watch.

When Officer A1 leaved from bridge and he was getting rest in his cabin, since he heard a loud noise, he went back to the bridge. The Officer A1 saw that Vessel B had collided with starboard midship section vicinity of bow of Vessel A, and the Officer A1 return to his room and we wear lifejacket immediately and he went back to bridge.

*2 "Off-center" refers to a display method in which the ship's position on the radar screen (the center bright spot) is eccentric in the direction opposite to the ship's course to widen the area monitored ahead of the ship (eccentric indication method).

*3 The term "course up" refers to the display method in which the ship's planned course is directly above the radar screen.

*4 An "echo trail" is a wake in which the radar image of an object is displayed in the form of afterglow.

*5 "Automatic Radar Plotting Aids (ARPA)" means a device that automatically processes changes in the position of other ships detected by radar and displays the ship's course, speed, closest approach time, closest approach distance, and predicted future position. The device also has a function to issue an alarm when the danger of a collision with another ship is predicted due to its proximity.

The Officer A1 called to the Japan Coast Guard by VHF radiotelephone system (hereinafter referred to as "VHF"), and said "This vessel has collided with fishing boat 6.4M east from Tomari Port. This vessel has been flooding."

(2) Statement of the master and the Chief fisherman of Vessel B

For Vessel B, the master (hereinafter referred to as "Master B"), Chief fisherman (hereinafter referred to as "Chief fisherman B") and 13 crews (Nationality : 11 Japan, 2 Republic of Indonesia) were on board. Vessel B was departure from Hachinohe toward Tsugaru Straits around 22:40 on 28 February, 2020 for the purpose of fishing, and Vessel B was returning to the home port together with Vessel C, Vessel D and Vessel E around 19:30 on 29 February, 2020 after fishing.

Chief fisherman B was navigational watch on duty alone, and Vessel B was set a course of 178° off the east coast of Shiriyazaki considering the pressure flow by wind and wave, and sailed heading south toward by auto pilot.

Since off the east coast of Rokkasho Village was fishing area of Vessel B, Chief fisherman B decided to search for schools of fish at this sea area under the sailing. Chief fisherman B was sitting on a chair, watching the fish finder located below of the steering stand and continued to sail of Vessel B.

Chief fisherman B set true bearing, and found the Vessel A about 3.5M forward of Vessel B on the radar of 3M range using off-center. When the distance between Vessel A and Vessel B was less than 3M, Chief fisherman B confirmed the red light (port side light) of Vessel A by the binoculars. Since he also saw that Vessel A seemed navigating on a course of around 020°, he believed that Vessel A could pass in forward of the Vessel B safely and Vessel A could pass port to port with Vessel C.

Although Chief fisherman B had heard by the fishing radio from Ship D and Ship E that they said "we can see a ship running on a strange course", he did not involve in their conversation.

Around 22:10, when Chief fisherman B was seating on the chair and watching the fish finder under navigate of the Vessel B, vessel B collided with Vessel A.

The Chief fisherman B was flied forward by the impact of collision and hit his face, and he looked up and his eyes to the front, since the bow of Vessel B was in close contact with Vessel A, he disengaged the clutch. Then, Vessel A moved to forward starboard side of Vessel B and he saw that the bow of vessel B went away from vessel A.

The Chief fisherman B did not expect that Vessel A heading toward Vessel B after heading east of Vessel B's course extension.

Although Chief fisherman B normally used the ARPA function of the radar when he felt that dangerous vessel heading toward vessel B, the ARPA function was not used for Vessel A at that time of this accident. (See Figure 1)

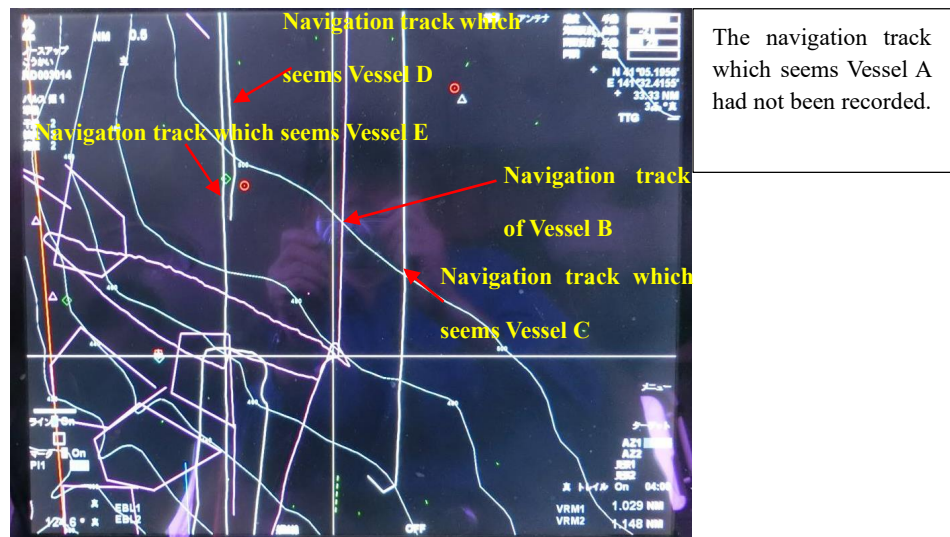


Figure 1 Navigation track recorded on the radar plotter of Vessel B

Although Master B was resting in his cabin, he became aware of the accident and went up to the bridge. When Master B went up to the bridge, port side of Vessel B was in close contact with Vessel A, but then Vessel B went away from Vessel A.

Around 20 minutes after collision, Master B saw that Vessel A sank, and he notified the Japan Coast Guard around 22:35 that vessel B collided with a cargo vessel in sea area around 6.5M east of Oaza Tomari, Rokkasho Village, Kamikita County, Aomori Prefecture, and the other vessel had sunk.

(3) Statement of the Chief fisherman of Vessel C

Vessel C was sailing around 0.5M forward port side of Vessel B and she was heading toward Hachinohe port together with Vessel B, Vessel D and Vessel E from fishing ground.

Chief fisherman of Vessel C (hereinafter referred to as “Chief fisherman C”) was navigational watch on duty. Since he found Vessel A on the 4M range of the radar without off-center, he kept watch the movement of the Vessel A by the echo trail 30 minutes setting, and he knew that Vessel A was not Japan Flagged Vessel by the AIS information indicated on the radar. Then, since he saw Vessel A heading toward Vessel C, the cursor was set to Vessel A on the radar and kept watch continuously.

Since the distance between Vessel A and Vessel C less than 1M, when Chief fisherman C saw that Vessel A closed the distance, he felt danger of the collision. He changed to manual steering and attempted to turn to starboard in order to avoid from Vessel A. When the distance between Vessel A and Vessel C was about 0.6M, since Vessel A turned sharply to port and showed a green light (starboard

light), he suddenly canceled to turn to starboard and kept on course to sail toward south.

After Vessel A turned to port and heading toward Vessel B, Chief fisherman C felt strange, because he could not see the lights of Vessel B which was heading toward south with Vessel C, and Vessel A and Vessel B on the radar did not move away from each other.

When he inverted Vessel C and Vessel C was heading toward Vessel B and Vessel A, he communicated with Vessel D and Vessel E by the fishing radio, and he understand that Vessel A and Vessel B had collided.

(4) Statement of the Chief fisherman of Vessel D

Vessel D was sailing around 2M of aft starboard side of Vessel B, and she was heading toward Hachinohe port together with Vessel B, Vessel C and Vessel E from fishing ground. (See Figure 2).

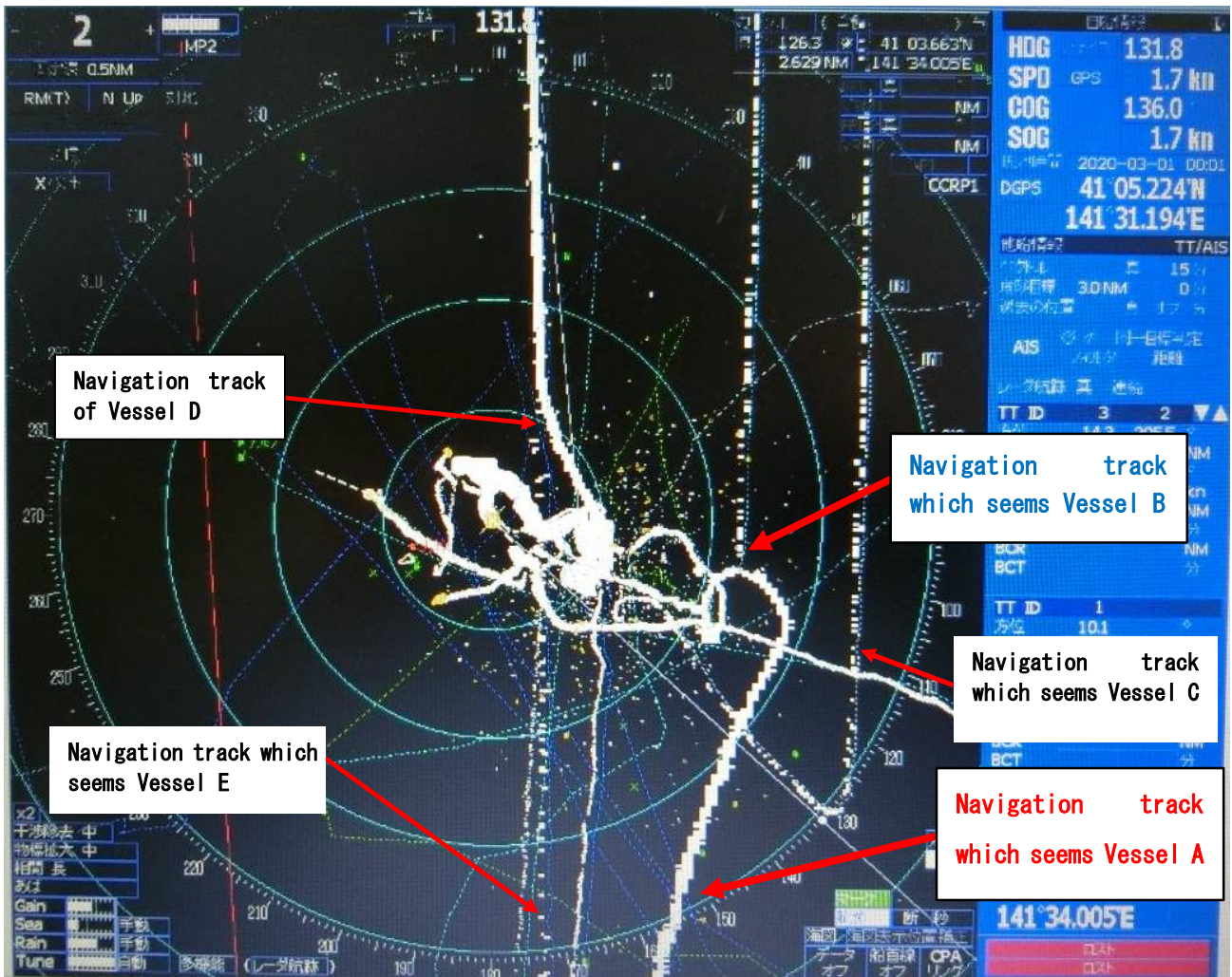


Figure 2 Navigation track recorded on the radar plotter of Vessel D

Chief fisherman of Vessel D (hereinafter referred to as “Chief fisherman D”) was talking with Chief fisherman B, Chief fisherman C and Chief fisherman of Vessel E (hereinafter referred to as “Chief fisherman E”) by the fishing radio for wake up.

Although he was also listening the VHF 16ch, there was no call and contact from Vessel A.

(5) Statement of the chief fisherman of Vessel E

Vessel E was sailing around 4M forward port side of Vessel B and she was heading toward Hachinohe port together with Vessel B, Vessel C and Vessel D from fishing ground.

Chief fisherman E was navigational watch on duty, he saw that Vessel A which was counterturn and approaching was passing to the east side of vessel E on the course around 340° to 350°.

When Vessel A passed to the east side of Vessel E and proceeded around 1M to 2M, since the Vessel A which seemed to be sailing on approximately 340° to 350° turned the course to eastward, Chief fisherman E said by the fish radio "This vessel is dangerous and what is doing".

When Chief fisherman E thought that the Vessel B was not shown on the radar, he heard by the fish radio that the vessel B collided.

2.1.3 Situation after Accident Occurrence according to Statements of the Crew Members

(1) Statement of Officer A1

i) Situation of the Vessel Inclination

Vessel A was in close contact with Vessel B and inclining to starboard side around 1° or 2°. Then, Vessel A was away from vessel B after around 5 minutes of collision, and widely inclined to starboard side.

ii) Situation in the Navigation Bridge

Officer A1 heard the sound on navigation bridge such as collapsing of the cargo. After that, since vessel A inclining forward and began to sink from bow, the loaded cargoes collapsed and moved to fore side. Since the front side of the cargo hold was empty (as seen from the bridge), Officer A1 believed that the vessel began to sink from bow.

Although Officer A1 instructed Officer A2 to move close to shore, Officer A2 said that Engine revolution could not increase and the direction of the vessel could not change. At that time, the ship's speed was 1.7kn. Also, since the navigation bridge was dark, although he did not understand the number of crews on bridge clearly, it seemed that around 10 crews were stayed in bridge.

iii) Situation until the sinking of the vessel

Since Officer A1 could see several fishing vessels other than vessel B, he launched of signal in order to call for emergency rescue, and he said to crews "Please abandon this vessel" by English and Vietnamese. Then, he went to near liferaft on aft port side.

When Officer A1 was at aft port side, he heard the voice which Engineer at aft starboard side was calling for Officer A2. Since Officer A1 saw several crews around Engineer, he believed that all crews moved to aft side of the vessel A. These crews which he could confirm were wearing the lifejacket. When Officer

A1 was at near liferaft, he found that three crews of Chief Steward, Boatswain and Ordinary Seaman were next to him, and Master was also near him.

For Vessel A, the main Engine was running and began sink from bow.

iv) Situation until to be rescued

When vessel A was sinking, although Officer A1 was holding on to a handrail of stern and he was pulled into the water for about 10 to 15 meters, he raised up to the surface. When his body raised up to the surface, although he saw three crews around himself, he did not know who they were. After that, he lost sight of three crews.

When Officer A1 grabbed onto a floating oil tank and to seek help, he was rescued by one of the fishing vessels. He felt the time which passed over 25 ~ 30 minutes from turning on the light of lifejacket until he was rescued.

v) Situation of the Main Engine and Liferaft

After the collision of Vessel A, it was impossible to enter in the Engine room. Insofar as Officer A1 could tell, main Engine had not been stopped and liferaft had not also been launched, until sinking of Vessel A.

(2) Statement of Master B and Chief fisherman B

Chief fisherman B confirmed the damage of Hull of Vessel B was drifting on sea, he found that Vessel B was damaged with hole. It was dangerous situation that she may flooding if she keep sailing. Furthermore, since the sea was rough, Vessel B was drifting on sea and she was receiving wind and waves from stern.

Chief fisherman B did not see sinking of Vessel A.

Vessel B was started to sail toward Hachinohe port under around ship's speed 2~3 kn at around 03:00 on March 1 at that time of accident occurrence, and she arrived at around 11:30 to this port. Also, Chief Fisherman B was taken to a hospital by an ambulance car on standby, and he was diagnosed with a brain concussion and palpebral part contusion.

(3) Statement of Chief fisherman C

When Vessel C was counterturn, the distance between Vessel B and Vessel C was around 1M, and he confirmed after arriving at accident site that Vessel D was meet immediately.

Although Chief fisherman C believed that the lighting of Vessel A had turned off and had occurred blackout when Vessel C arrived at the accident site, he did not see sinking of vessel A.

Chief fisherman C ordered chief fisherman B to check the status of the damage of Vessel B. He was informed from chief fisherman B that it was not stringent situation and didn't have danger of sinking while the bow of vessel B had damaged.

Although Chief Fisherman C wanted to concentrate to rescue of Vessel A, since a mooring rope etc. floated on sea and it was dangerous to sail continuously, he turned on the searchlight and searched the liferaft and person with checking for dangerous floating objects on the sea surface.

Chief fisherman C was recovery the torn liferafts and lifejackets, and he found Officer A1. However, since the wave was high, he entrusted to Vessel E to rescue of Officer A1. He could not find Crews of Vessel A other than officer A1.

Before sinking of Vessel A, Chief fisherman C felt like to see one or more person having flashlight.

(4) Statement of Chief fisherman D

Chief fisherman D heard that Chief fisherman C said “Vessel B collided”, and Vessel D turned to port and Vessel D approached accident site by relying on the navigation light and working light of vessels around the accident site.

Although the ship’s speed of Vessel D was 12kn, it took around 10 minutes from change course to arrive near the accident site. By the time Vessel D arrived at accident site, Chief fisherman D heard from fishing radio “Vessel A was sinking”. Around a few hundred meters away, he could faintly see around a few hundred meters away that raising a spray from Vessel A which was sinking into sea under the light of working light of consort.

Before sinking of Vessel A, he saw something red rising what is perhaps a smoke signals.

After arrived at accident site, Vessel D salvaged the released liferaft by crane, it got water in the liferaft and no person was on board.

The salvaged life raft was Inflatable type liferaft with awning and it was fifteen (15) seaters.

(5) Statement of Chief fisherman E

When Vessel E was sailing toward south ahead of Vessel B, C and D, Chief fisherman E heard “Vessel B collided” by fishing radio, and Vessel E was counterturn and sailing toward accident site.

According to the AIS record of Vessel A and status of echo trails displayed on the radar screen, while Vessel B was sailing toward vicinity accident site, Chief fisherman E believed that Vessel A was turned around 4kn of ship’s speed.

Vessel E arrived at accident state and crew of vessel E found Officer A1. Therefore, they dropped the net for fishing operation from slope of stern to sea surface, and Officer A1 gripped in the net and was raised onto the deck. Vessel E also salvaged one liferaft.

When Officer A1 was raised into the deck, since he was shaking violently, some crews of Vessel E massaged him.

Around 02:15 on March 1, Vessel E arrived at Hachinohe port with Officer A1.

Chief fisherman E remained the following note which the status at that time of accident is described. (In no particular order)

Vietnamese

14 Crews

Blood pressure

1st : 23:30 81 118

2nd : 00:25 75 115

Left foot, Right flank

Collision?

22:15 41-05-08 141-31-72

(Person)23:00 41-05-32 141-31-37

02:15 Arrival at port

The time and date were around 22:10 on February 29, 2020 and the location of accident occurrence was at distance around of 098° 6.6M from the lighthouse on the No. 1 East Breakwater at Yakeyama, Shiranuka Port.

(See Appendix 1-1 Diagram of estimated navigation route and Appendix 1-2 Diagram of estimated navigation route (Enlarged))

2.2 Injuries to Persons

According to the statement of the Officer A1, Master B, Chief fisherman B and the person in charge of the Japan Coast Guard Office, 13 of the 14 crew members of the vessel A were missing and Chief fisherman B was injured.

2.3 Damage to Vessel

According to the on-site investigation of Vessel B and the statement of the Officer A1, Master B, and Chief fisherman B, there were as follows;

(1) Vessel A

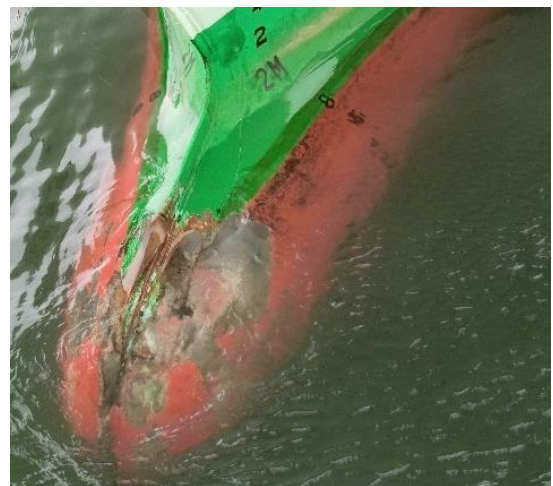
Vessel A was flooded and sunk.

(2) Vessel B

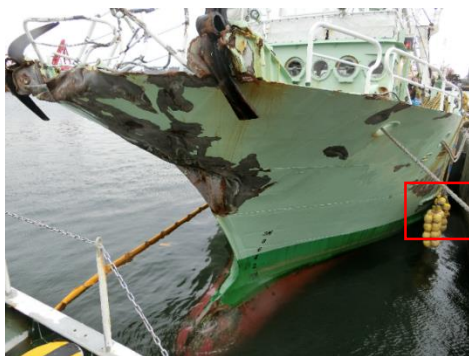
Vessel B was suffered and dented with holes on the bow, and dented and scratched on the bulbous bow and shell plating of port side bow. (See Figure 3).



Damage of Bow



Damage of Bulbous Bow



Damage of port side bow (1)



Damage of port side bow (2)

Figure 3 Damage of Vessel B

2.4 Crew Information

(1) Age, and Certificate of Competence

- i) Master A, Master A, 48 years old, Nationality of the Republic of the China
Certificate: Unknown
- ii) Officer A1, 33 years old, Nationality of the Republic of Vietnam
Certificate: Unknown
- iii) Officer A2, 29 years old, Nationality of the Republic of Vietnam
Certificate: Unknown
- iv) Master B, 51 years old
Fourth grade maritime officer (navigation)
Date of issue August 11, 2006
Date of revalidation July 21, 2016
Date of expiry August 10, 2021
- v) Chief Fisherman B, 73 years old
Fifth grade maritime officer (navigation)
Date of issue April 11, 1975
Date of revalidation August 10, 2011
Date of expiry August 9, 2016
Qualification for deck portion navigational watch is effective.

(2) Seagoing Experience, etc.

1) Vessel A

According to the statement of Officer A, it was as follows;

- a. Master A
Unknown
- b. Officer A1
After graduating from school, first boarded as an ordinary seaman in 2007 and worked on various vessels and boarded Vessel A on October 29, 2019.
At the time of the accident, his health condition was good.
- c. Officer A2
After graduating from university, Officer A2 had been experience on board the vessel and had been on board vessel A for approximately eight months. He was trusted for his duties by the Master A.

2) Vessel B

According to the statement of Master B and Chief fisherman B, there were as follows;

- a. Master B
He became the seaman around the age of 20, and started to work as a Master since September 2011.
At the time of the accident, his health condition was good.
- b. Chief fisherman B

At around the age of 18 years, he became the seaman of Tomimaru Akiyama Fishing Co. (hereinafter referred to as "Company B"), the owner of Vessel B. After working as a Chief fisherman on a fishing vessel owned by a company other than Company B for about three years from around the age of 34, since Company B had a vacancy for a Chief fisherman, he returned to Company B and worked as a Chief fisherman.

At the time of the accident, his health condition was good.

2.5 Vessel Information

2.5.1 Particulars of Vessel

(1) Vessel A

| | |
|----------------------|--|
| IMO Number : | 9368118 |
| Port of Registry : | Belize |
| Owner : | GUO XING SHIPPING CO.,LTD. (Republic of the Marshall Islands) |
| Management Company : | BAO SHENG SHIPPING CO.,LTD. (People's Republic of China) |
| Class : | Intermaritime Certification Services (ICS) |
| Gross Tonnage : | 1,989 tons |
| L × B × D : | 87.25m × 13.50m × 7.10m |
| Hull Material : | Steel |
| Engine : | Diesel Engine x 1 set |
| Output : | 1,545 kW |
| Propulsion : | Fixed Pitch Propeller x 1 |
| Date of Launch : | August 2005 |

(2) Vessel B

| | |
|-----------------------|-----------------------------------|
| Vessel Number: | 132236 |
| Fishing Vessel | |
| Registration Number : | AM1-670 |
| Port of Registry : | Hachinohe City, Aomori Prefecture |
| Owner : | Company B |
| Gross Tonnage : | 138 tons |
| L × B × D : | 35.00m × 7.20m × 4.62m |
| Hull Material : | Steel |
| Engine : | Diesel Engine x 1 Set |
| Output : | 735 kW |
| Propulsion : | Controllable Pitch Propeller x 1 |
| Date of launch : | April 1993 |

(See Figure 4)



Figure 4 Vessel B

2.5.2 Loading conditions, etc.

(1) Vessel A

According to the record of the draft survey, when the Vessel A was departure from Hachinohe Port Quay B Hattaro, scrap metal 3,150 tons had been loaded, and the draft was approximately 4.81m at the bow and 5.90m at the stern. (See Figure 5.)

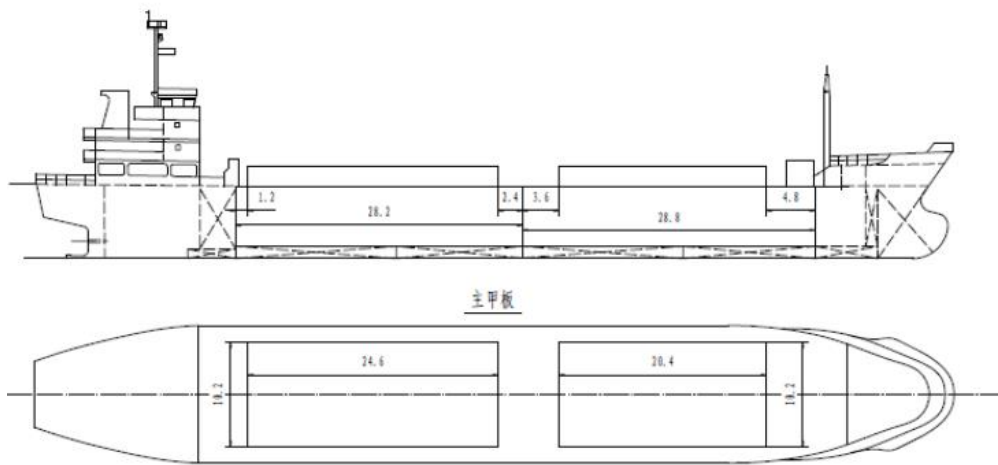


Figure 5 Vessel A – General Arrangement (Outline)

(2) Vessel B

According to the statement of Chief fisherman B, when Vessel B returned to Hachinohe Port, approximately 17 tons of cod and flounder catch had been loaded, and the draft was unknown. (See Figure 6)

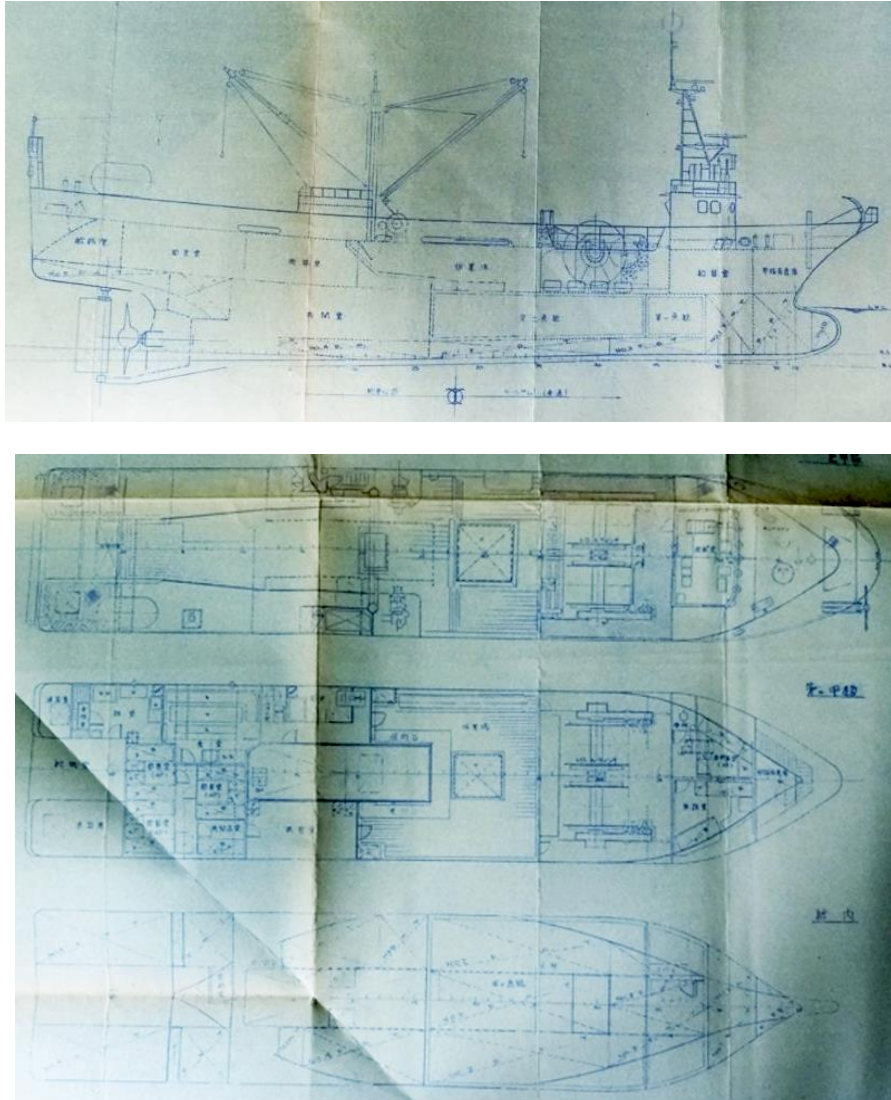


Figure 6 Vessel B – General Arrangement

2.5.3 Equipment in the Navigation Bridge

(1) Vessel A

According to the statement of Officer A1, it was as follows;

For Vessel A, steering stand was located on the center of the forward navigation bridge, and remote control system of main engine, AIS, starboard side radar and VHF were located on the starboard side of steering stand. Also, VHF and port side radar were located on port side of the steering stand, and chart table and GPS plotter were located on aft port side of the navigation bridge.

(2) Vessel B

According to the on-site survey of vessel B and the statement of Chief fisherman B, it was as follows;

For Vessel B, steering stand located on center of navigation bridge, and GPS plotter and No.1 radar were located on starboard side of it. Also, No.2 Radar and tidal current meter were located on port side of the steering stand, and fish finder located below No. 2 radar. Both No.1 & No.2 radars which set to true bearing were used. (See Figure 7 ~ Figure 9)

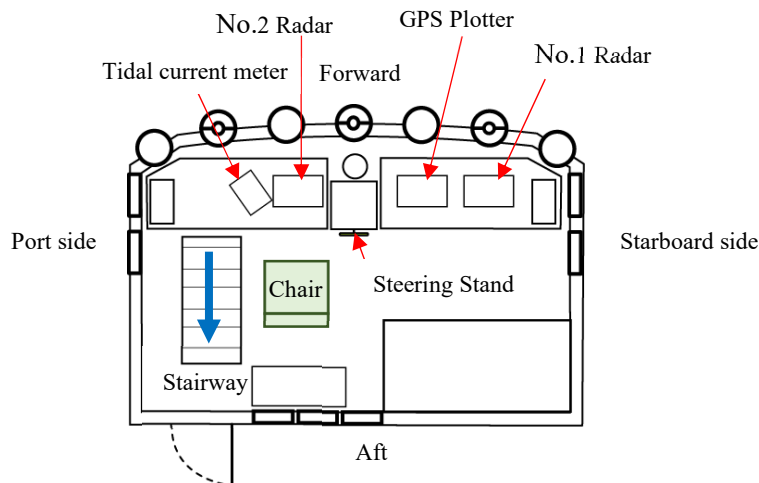


Figure 7 General Arrangement in Navigation Bridge of vessel B (Outline)

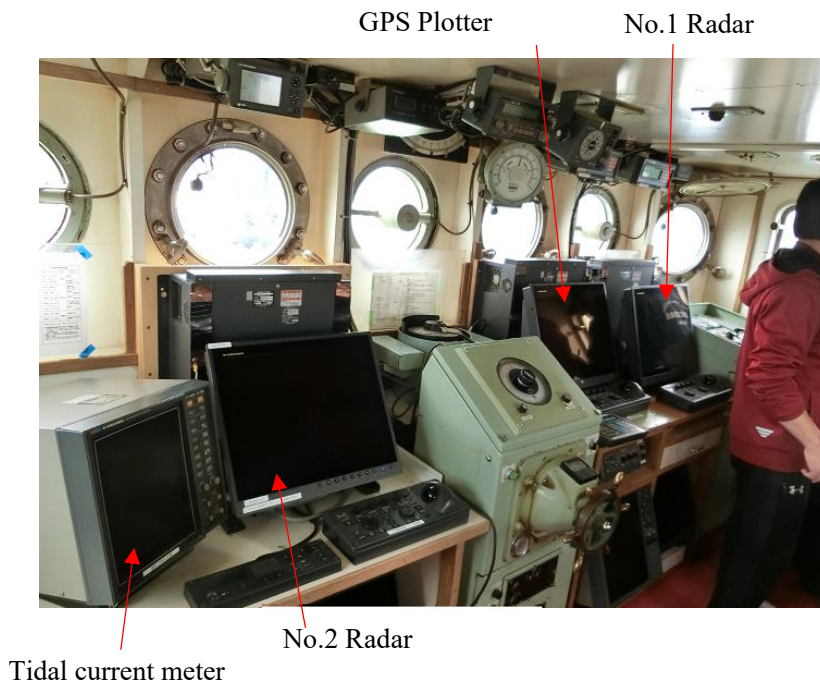


Figure 8 Arrangement in the Navigation Bridge of Vessel B

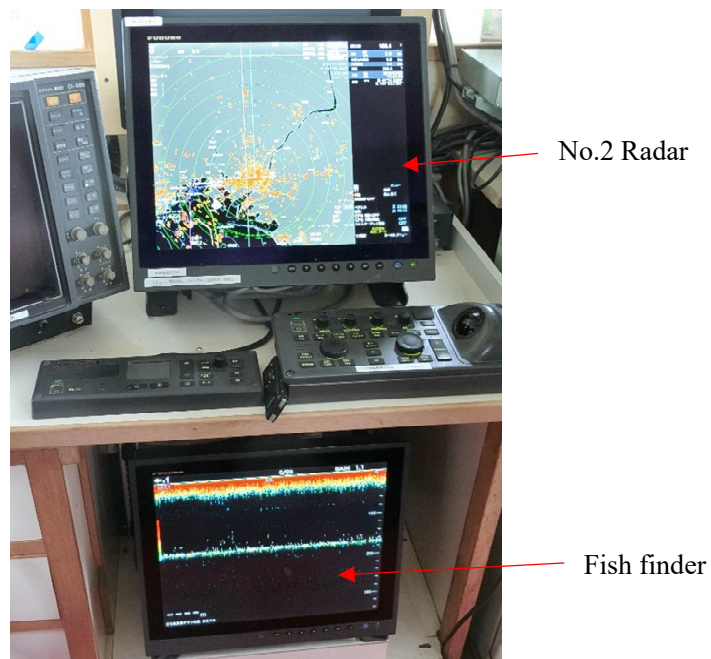


Figure 9 Arrangement in Navigation Bridge of vessel B (Port side)

2.5.4 Situation of Visibility from Navigation Bridges

(1) Vessel A

Since Vessel A had sunk, the visibility from the Navigation Bridge could not be confirmed.

(2) Vessel B

There was no obstruction for lookout on towards the bow, and visibility was good. (See Figure 10)



Figure 10 Situation of Visibility from Navigation Bridges

2.5.5 Other Relevant Vessel Information

(1) Vessel A

According to the statement of Officer A1, there were no defects or failures in the hull of Vessel A, main engine and equipment at that time of the accident.

(2) Vessel B

According to the statement of Chief fisherman of Vessel B, there were no defects or failures in the hull of Vessel B, main engine and equipment at that time of the accident.

2.6 Weather and Sea Conditions

2.6.1 Weather and Sea Observations

(1) Weather and Tide Data

Observations from 22:00 to 22:40 on February 29 at the Odanosawa Local Meteorological Observatory located about 20km north-west of the accident site were as follows;

| Time | Amount of rainfall (mm) | Average wind speed (m/s) | | Maximum instantaneous wind speed (m/s) | |
|-------|-------------------------|--------------------------|------------|--|------------|
| | | Wind direction | Wind speed | Wind direction | Wind speed |
| 22:00 | 0.5 | SE | 6.7 | SE | 10.8 |
| 22:10 | 0.0 | SE | 6.1 | SE | 11.0 |
| 22:20 | 0.0 | SE | 6.6 | SSE | 11.7 |
| 22:30 | 0.0 | SE | 6.7 | SE | 11.1 |
| 22:40 | 0.0 | SE | 6.3 | ESE | 10.6 |

Observations from 22:00 to 22:40 on February 29 at the Hachinohe Special Area Meteorological Observatory located about 62km south of the accident site were as follows;

| Time | Amount of rainfall (mm) | Average wind speed (m/s) | | Maximum instantaneous wind speed (m/s) | | Weather | Visibility (km) |
|-------|-------------------------|--------------------------|------------|--|------------|---------|-----------------|
| | | Wind direction | Wind speed | Wind direction | Wind speed | | |
| 22:00 | 0.0 | SSE | 4.8 | SSE | 7.3 | Sleet | 20.0 |
| 22:10 | 0.0 | SSE | 4.5 | SSE | 7.4 | Rain | - |
| 22:20 | 0.0 | SE | 4.5 | SE | 7.9 | Rain | - |
| 22:30 | 0.0 | SE | 4.4 | SE | 6.8 | Rain | - |
| 22:40 | 0.0 | SE | 4.5 | SE | 7.1 | Rain | - |

(2) According to the coastal wave analysis charts of the Japan Meteorological Agency, the estimation values of wind and wave on February 29 and March 1 in the vicinity of accident site are as follows;

| Date & Time | Wind direction | Wind speed | Wave direction | Wave period | Significant wave height*6 |
|--------------------|----------------|--------------------------|----------------|-------------|---------------------------|
| 29 February, 21:00 | ESE | 23kn (Approx.11.8m/s) | ESE | 5 Sec. | 1.4m |
| 1 March, 09:00 | SSW | 1kn (Approx.0.5m/s) | E | 7 Sec. | 2.2m |

(3) Sea Surface Temperature

According to the daily sea surface temperatures published by the Japan Meteorological Agency on its website, the sea surface temperature in the vicinity of the accident site on February 29 was approximately 8°C.

*6 "Significant wave height" is the average wave height of waves observed at a certain point at a certain time, from the highest to the lowest, up to 1/3 of the total. It is said to be close to the wave height based on visual observation. (Sec 3.3.1(1)).

2.6.2 Observation by Crew

- (1) According to the statement of the Officer A1, the weather was rainy, the wave height was a little over 2 m, and the direction of the waves was from the right (east side) to the left (west side) of this vessel.
- (2) According to the statement of Chief fisherman B, Chief fisherman C and Chief fisherman D, the weather was sleet, the wind was from the southeast with a force of 4 to 5, the wave height was about 3 m from the southeast, visibility was good, and the sea surface temperature was approximately 8°C.

2.7 Information Relevant to Watch keeping Arrangement

2.7.1 Vessel A

According to Officer A1, bridge watch keeping arrangement was as follows:

| Title | Watch keeping Time |
|-----------------|--------------------|
| Officer | 00:00~04:00 |
| Officer Cadet | 12:00~16:00 |
| Officer A1 | 04:00~08:00 |
| Boatswain | 16:00~20:00 |
| Officer A2 | 08:00~12:00 |
| Ordinary Seaman | 20:00~00:00 |

2.7.2 Vessel B

According to the statement of Master B and Chief fisherman B, when vessel B toward the fishing ground, navigational watch on duty was rotated by Master B, Officer and young ordinary seaman. When Vessel B was returning from fishing ground, crews were resting who were tired from fishing work, and Chief fisherman was navigational watch on duty alone.

2.8 Information Relevant to Search and Rescue

According to the information by the Japan Coast Guard, it was as follows;

Around 22:17 on February 29, 2020, the Japan Coast Guard received the emergency call from Vessel A by the VHF “We have collided with Fishing Vessel at 6.4M east from Tomari Port. This vessel is flooding.”

Also, the Japan Coast Guard received the signal by EPIRB*7 (Emergency Position Indicating Radio Beacon) of Vessel A around 22:33.

Furthermore, around 22:35, the Japan Coast Guard received the call the emergency number 118 from Vessel B “We have collided with a cargo vessel in sea area around 6.5M east of Oaza Tomari, Rokkasho Village, Kamikita County, Aomori Prefecture, and another vessel had sunk”

The Japan Coast Guard immediately dispatched two patrol vessels and two patrol crafts upon receipt of the emergency call. Then, the search of crews of Vessel A was conducted by

*7 “EPARB : Emergency Position Indicating Radio Beacon” refers to a buoy-type radio device that emits a distance signal to a satellite and is automatically levitated by a water pressure sensor when a vessel sinks and sends out a distress signal.

additional five airplanes, a patrol vessel, special rescue team and riot police.

On 00:00 1 March, the medium scale task force for the sinking of the G marine accident off Tomari, Rokkasho Village, Aomori Prefecture has been located in the Japan Coast Guard.

2.9 Survival Time Underwater

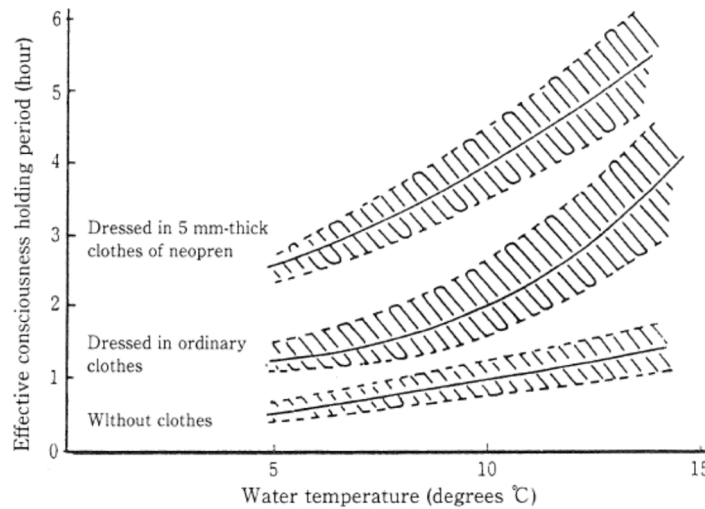
According to the SOLAS TRAINING MANUAL (29 Edition, Authorized by Seafarers Policy Division Maritime Bureau, Ministry of Land, Infrastructure, Transport and Tourism of Japan, Issued by The Association for Promoting Safety and Sanitation for Seafarers) is as follows;

1-4 Clothing when Abandoning Ship

(1) Importance of thick, warm clothes

- (i) When the central body temperature of a person falls below 35°C, he has hypothermia. Hypothermia is the greatest cause of loss of life after abandoning ship.
- (ii) The hours a human being can maintain consciousness in water is shown in the graph below.

Relationship between water temperatures and hours during which consciousness can be maintained in water.



Although the number of hours a human being can survive in water differs by the individual, estimated survivable hours dressed in normal clothes are as follows;

| <i>Seawater Temperature</i> | <i>Survivable Hours</i> |
|------------------------------|----------------------------|
| <i>2°C (35°F) or less</i> | <i>3/4 hours or less</i> |
| <i>2°C(35°F)~4°C(40°F)</i> | <i>1 1/2 hours or less</i> |
| <i>4°C(40°F)~10°C(50°F)</i> | <i>3 hours or less</i> |
| <i>10°C(50°F)~15°C(60°F)</i> | <i>6 hours or less</i> |
| <i>15°C(60°F)~20°C(60°F)</i> | <i>12 hours or less</i> |

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Analysis of AIS records of Vessel A

(1) Record of the heading

Regarding the verification based on AIS record of Vessel A shown in Table 1 of 2.1.1, the vessel was kept the heading from north-north-east to west-north-west after 22:07:10, and it is shown that Vessel A was moving from north-north-west to north-west at a speed of around 7kn. This ship track is extremely unnatural for the cargo ship with one fixed pitch propeller as a propulsion system (2.5.1(1)) which sailed on the open sea area under the weather and sea condition (2.6) at that time of the accident.

(See Figure 11 - Ship track of Vessel A from 22:06:32 to 22:10:24 on 20200229 according to AIS record of Vessel A)

In general, the value of heading in AIS record is recorded the measurement value by the Gyro compass, magnetic compass or GPS compass located on the vessel. The document*⁸ has described "During a turn, the hull turns in such a way that bow is looked toward inside and the stern swings outward." Although heading of vessel during turn is looked toward inward generally, the AIS record of Vessel A is shown after 22:07:10 that the heading look toward outward of the ship track of vessel A turning to port.

Vessel A had sunk and JTSCB could not investigate the navigation equipment of this vessel. However, in view of the above, it is probable that the heading of vessel A after 22:7:10 on AIS record were not recorded correctly.

*8 "Theory and Practice of Manuvering Ship (Supplemented Edition)" by Kinzo Inoue, published by Seizando Shoten, March 18, 2021.

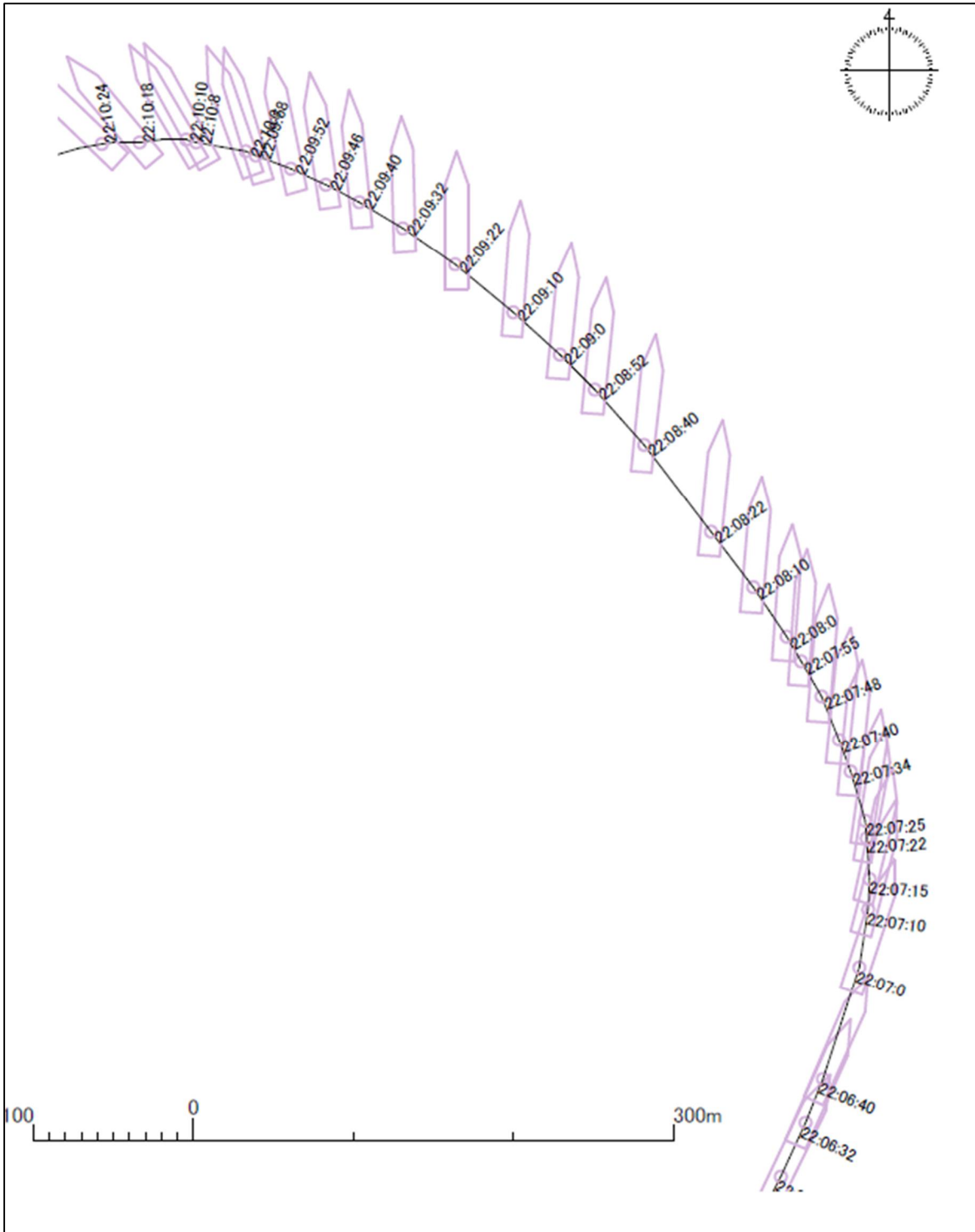


Figure 1 Ship track of Vessel A from 22:06:32 to 22:10:24 on 20200229 according to AIS record of Vessel A

3.1.2 Situation Relevant to the Ship's Speed of Vessel B

Since the heading and ship's speed at the main point of Vessel B until around 22:13 recorded by the GPS (2.1.1) have been shown on Table 3, the JTSB concludes that the situation of sailing of Vessel B until collision was as follows;

- (1) Vessel B departed from the fishing grounds at about 19:30, and sailed at a heading of about 174° and a speed of about 12.2kn up to the east of Shiriyazaki (Nos. 1-2). After that, she was sailing toward south at a heading of about 180° and a speed of about 11.9kn to the east of Nakayamazaki in Rokkashomura until about 22:00. (Nos. 2 - 3)
- (2) From about 22:00 to 22:09, Vessel B was sailing toward south on a heading of about 181° ~ 182° at a speed of about 11.4 kn ~ 12.0 kn (Nos. 3 to 14). After that, at about 22:10 (No. 15), her heading changed from about 182° to about 240°, and its speed decreased from about 11.8 kn to about 6.5 kn.

Table 3 Heading and ship's speed at the main point of Vessel B

| No. | Time (HH: MM: SS) | Position | | Headin (°) | Distance (M) | Speed (kn) |
|-----|----------------------|--------------------------|---------------------------|---------------|-----------------|---------------|
| | | Latitude (N) (°.-'-") | Longitude (E) (°.-'-") | | | |
| 1 | 19:30:18 | 41-37-00.8 | 141-31-07.9 | - | - | - |
| 2 | 20:25:46 | 41-25-46.3 | 141-32-38.9 | 174 | 11.3 | 12.2 |
| 3 | 22:00:03 | 41-07-09.8 | 141-32-33.5 | 180 | 18.6 | 11.9 |
| 4 | 22:01:41 | 41-06-50.3 | 141-32-32.7 | 182 | 0.3 | 11.9 |
| 5 | 22:02:29 | 41-06-40.7 | 141-32-32.4 | 181 | 0.2 | 12.0 |
| 6 | 22:03:18 | 41-06-31.1 | 141-32-31.9 | 182 | 0.2 | 11.8 |
| 7 | 22:04:06 | 41-06-21.6 | 141-32-31.4 | 182 | 0.2 | 11.8 |
| 8 | 22:04:57 | 41-06-11.5 | 141-32-31.0 | 182 | 0.2 | 11.4 |
| 9 | 22:05:46 | 41-06-01.7 | 141-32-30.7 | 181 | 0.2 | 12.0 |
| 10 | 22:06:36 | 41-05-51.8 | 141-32-30.3 | 182 | 0.2 | 11.9 |
| 11 | 22:07:25 | 41-05-42.0 | 141-32-29.9 | 182 | 0.2 | 12.0 |
| 12 | 22:08:14 | 41-05-32.3 | 141-32-29.5 | 182 | 0.2 | 11.9 |
| 13 | 22:09:04 | 41-05-22.4 | 141-32-29.0 | 182 | 0.2 | 11.9 |
| 14 | 22:09:53 | 41-05-12.8 | 141-32-28.4 | 182 | 0.2 | 11.8 |
| 15 | 22:10:42 | 41-05-10.2 | 141-32-22.4 | 240 | 0.1 | 6.5 |
| 16 | 22:11:31 | 41-05-06.4 | 141-32-17.8 | 222 | 0.1 | 6.3 |
| 17 | 22:12:22 | 41-05-02.2 | 141-32-16.5 | 194 | 0.1 | 5.1 |
| 18 | 22:13:10 | 41-05-00.7 | 141-32-15.7 | 200 | 0.03 | 2.1 |

※ Above Numbers are in accordance with Table 2 of 2.1.1.

3.1.3 Course of the Events

The JTSB concludes that the course of the events was as follows;

(1) Vessel A

According to the AIS record (2.1.1), statement of Officer A1 (2.1.2(1)) and 2.7.1, it is probable that the course of events leading to the occurrence of the accident on vessel A was as follows;

- i) Vessel A was departure from Hachinohe Port, Quay B Hattaro at around 17:45 on February 29, 2020, and was sailing toward north-ward off the east coast of Shimokita Peninsula toward the Republic of Korea.
- ii) Around 20:45, Officer A took over navigational watch to Officer A2, and recorded of the ship's position on 20:50 on the Logbook and chart. Then, navigational watch had been changed to Officer A2.
- iii) From around 21:00 to 21:50, Vessel A sailed changing course to the right and left between around 343° to around 011° of a course over the ground under the ship's speed around 7.6kn to around 8.1kn.
- iv) Vessel A started to turn to starboard at around 21:52 and continued to turn to starboard slowly until 22:07. Then, Vessel A started to turn to port precipitously, at around 22:08, she completed to turn left and she started to sail toward north-west.
- v) Although Vessel A was sailing toward north-west, she started to turn to port again at around 22:09, and Vessel A collided with Vessel B at around 22:10 under ship's speed 7.1kn and course over the ground 289°.

(2) Vessel B

According to the GPS records of Vessel B (2.1.1), the heading and speed of main point of Vessel B determined from the record (3.1.2), statement of Chief fisherman B (2.1.2(2)) and 2.7.2, the course of events leading to the occurrence of the accident was as follows;

- i) Around 19:30 on February 29, Chief fisherman B was navigational watch on duty alone and Vessel B start to sail toward south by autopilot after finishing the fishing.
- ii) Around 20:25, Vessel B reached a point about 090°3.7M from the Shiriyazaki lighthouse (approximate position 41°25'46.3"N, 141°32'38.9"E). Then, Vessel B was sailing toward south continuously under autopilot at the course 178°, heading around 181° ~ 182° and ship's speed 11.4 ~ 12.0kn. Around 22:10, Vessel B collided with Vessel A under same course, heading and speed as same as above.

3.1.4 Date, Time and Location of the Occurrence of the Accident

Based on the following reason, the JTSB concludes that the date, time and location of the occurrence of the accident around 098°6.6M from the lighthouse on the east breakwater of Yakeyama No.1 at Shiranui Port at around 22:10 on February 29, 2020.

- (1) As shown in Table 3 of 3.1.2, from 22:09:53 (No.14) to around 22:10:42 (No.15) of 45 second later, heading of Vessel B was changed from around 182° to around 240°, and speed of this vessel was decreased from 11.8kn to 6.5kn.
- (2) The diagram of situation of collision has been made based on the AIS record of Vessel A shown in Table 1 of 2.1.1, the statement of the Officer A1 of 2.1.2 (1) and GPS record

of Vessel B shown in table 2 of 2.1.1. In this regard, it shows that the bow of Vessel B collided to the bow side vicinity of starboard side midship section of Vessel A from 22:09:58 to 22:10:00 in AIS record of Vessel A. (See Appendix 2-1 Diagram of situation of collision (Enlarged)).

As described in 3.1.1(1), the heading recorded by AIS of Vessel A has not been correctly recorded at that time of the accident and the document has been described “During a turn, the hull turns in such a way that bow is looked toward inside and the stern swings outward.”. Therefore, the heading of Vessel A between 22:07:10 and 22:13:30 on the drawing of statement of collision has been shown by using the values of course over the ground as same time of it.

3.1.5 Date, Time, and Location of Sinking of Vessel A

Based on the following reason, the JTSCB concludes that Vessel A had been sunk between 22:31 and 22:33 on February 29, 2020 at around 098° 6.1M from the No. 1 East Breakwater Lighthouse at Yakeyama, Shiranuka Port (41°05'14.3"N, 141°31'50.7"E. It was around bearing 275° and distance 880m from the location of this accident).

- (1) As described in 2.1.1, the AIS record of Vessel A has not recorded since for vessel A since 22:31:41, vessel position 41°05'14.3"N, 141°31'50.7"E.
- (2) As described in 2.8, the Japan Coast Guard has received the signal from EPIRB of Vessel A at around 22:33.
- (3) As described in 2.1.2 (2), Chief fisherman B has stated that he saw sinking of vessel A around 20 minutes after the collision.

3.1.6 Injuries or Deaths

(1) Vessel A

As described 2.2, 13 of the 14 crews of vessel A, except Officer A1, were missing. In this regard, since 13 crew members except Officer A1 were missing and Officer A1 did not see or hear of any injuries to other crew members of vessel A as a result of the collision, it is unclear whether or not any crew members of vessel A were injured as a result of the collision.

(2) Vessel B

According to statement of Chief fisherman B and Master B (2.1.2(2) and 2.1.3(2)), since Chief fisherman B was flied forward by the impact of collision and hit his face, he suffered a brain concussion and palpebral part contusion.

3.1.7 Damage to Vessels

(1) Vessel A

As described 2.1.2(1), 2.1.3 and 2.3(1), it is probable that Vessel A was damaged with hole to the bow side vicinity of starboard side midship section, and this vessel was sunk by flooding from this hole.

(2) Vessel B

As described in 2.3(2), Vessel B was damaged that the bow was dented with holes and scratched, and the shell plate of portside bow was scratched.

3.1.8 Situation of Collision

The JTSB concludes that the situation of collision was as follows:

- (1) Based on the 3.1.1 thru 3.1.5 and 3.1.7, Vessel A was sailing under speed around 7.1kn and a heading 289° and vessel B was sailing under speed around 11.4kn ~ 12.0kn and heading 181° ~ 182°, and there were collided between Vessel A's bow vicinity starboard side midship section and Vessel B's bow. As a result, it is probable that Vessel A was damaged with hole to the bow side vicinity of starboard side midship section and Vessel B was damaged that the bow side was dented with holes and scratched.
- (2) According to the following statements, it was likely that Vessel B was damaged that the shell plate of port side bow was scratched, because port side bow of vessel B was in close contact with the starboard side hull of vessel A which was sailing from collision to around 22:13.
 - The statement of Officer A1 "Vessel B moved away around 5 minutes after the collision".
 - The statements of Chief fisherman B "Since the bow of Vessel B was in close contact with Vessel A, he disengaged the clutch. Then, Vessel A moved to forward starboard side of Vessel B and he saw that the bow of vessel B went away from vessel A."
 - The statement of Master B "When master B went up the bridge, port side of Vessel B was in close contact with Vessel A, but then Vessel B went away from Vessel A." (2.1.2(2)).
 - The ship track of both vessels shown on Appendix 2-1 and 2-2.

3.1.9 Situation after the Collision

Based on the AIS record of Vessel A (Table 1 of 2.1.1), statement of Officer A1 (2.1.3(1)), statement of Chief Fisherman B (2.1.3(2)), the estimation of sinking date, time and location of Vessel A (3.1.5), situation of Deaths (3.1.6(1)) and statement of damage (3.1.7(1)), the JTSB concludes that the situation of after the collision as follows:

(1) Situation of collision and Sinking of Vessel A

After the collision of Vessel A, she was in close contact with Vessel B and inclined to starboard side around 1° or 2°, and widely inclined to starboard side after away from Vessel B at around 22:13. After that, the Vessel A was flooded from damage with hole of bow vicinity starboard side midship section and she started sinking.

Although the Main Engine of Vessel A was running after collision, it was no longer able to increase Engine revolution and to change the direction. Also, since it seems that crews of vessel A could not enter in the Engine Room, they could not stop the Main Engine, and Vessel A was sailing continuously under difficult condition to keep maneuvering of the vessel and consequently Vessel A had sunk between 22:31 and 22:33.

(2) The Situation of Vessel A's crew from Collision to Sinking

After the collision of Vessel A, Officer A1 and 10 crews came together in the Navigation Bridge. Officer A informed crews by English and Vietnamese to rise the distress beacon

in order to request the rescue to fishing vessels near of this vessel and to away from Vessel A. Then, they moved to liferaft located near aft starboard side.

In addition to Officer A, Crews wearing lifejacket had gathered on aft side of Vessel A which Officer A, Chief Steward, Boatswain, Ordinary Seaman and Master were on starboard side and Engineers and other crews are aft port side.

Although Officer A1 was pulled into the water when vessel A sank, he raised up to the surface and saw the three crews around him, but then lost sight of them. When he turned on the light of lifejacket and grabbed onto a floating oil tank to seek help, he was rescued by Vessel E.

(3) Situation of Vessel B

After the collision, although bow of Vessel B was in close contact with Vessel A, since Chief fisherman B disengaged the clutch, Vessel A proceeded toward right of the forward side of Vessel B and the starboard side of bow of Vessel B came into contact with starboard shell of Vessel A. Then, Vessel B was away from Vessel A at around 22:13.

Since Vessel B was damaged by collision which shell of bow was dented with holes and scratched, it was dangerous situation that she may flooding if she keep sailing. Furthermore, since the sea was rough, Vessel B was drifting on sea and she was receiving wind and waves from stern.

Around 03:00 on March 1 which was the day after the accident occurred, Vessel B started to sail toward Hachinohe Port under the speed around 2kn or 3kn, and arrived at the port at around 11:30.

3.1.10 Abandon Ship and Rescue of Fallen Person in Water

The JTSB concludes that situation of the Abandon Ship and Rescue of Fallen Person in Water were as follows;

(1) Vessel A

According to the statement of Officer A1 in 2.1.3(1) “the liferafts were not launched onto the sea surface” and statement of Chief fisherman C, D and E in 2.1.3 (3) ~ (5), it is probable that liferaft had not been launched from Vessel A onto the sea surface and the crews of Vessel A could not escape from Vessel A.

With Regard to the situation of the crew members of Vessel A, the statements of Officer A1 regarding the situation after the occurrence of accident (2.1.3(1) (iii) and (iv)) and the statement of Chief fisherman C, D, and E regarding the situation after the occurrence of accident (2.1.3(3) to (5)), it is probable that most of the crew members including Officer A1 with life jackets moved to the stern while some crew members remained on the bridge, and then, they were fallen in the sea when Vessel A was sink and crews except Officer A1 were missing.

With regard to rescue of Officer A1, according to the statement of Officer A1 for situation of the rescue (2.1.3(1)(iv)), the statement of Chief Fisherman E for rescue of Officer A1, the Chief Fisherman E’s note which was written about the situation of this accident “(Person) 23:00 41-05-32 1 41-31-37” (2.1.3(5)) and estimated sinking date, time and location of vessel A (3.1.5), it is probable that the Officer A1 turned on the light of lifejacket and grabbed onto a floating oil tank to seek help after vessel A sinking,

and then, he was rescued by Vessel E at around 23:00 on February 29, around 630 meters north-northeast of the sinking site (approximate position 41° 05' N, 32" E, 141° 31-37' W).

(2) Vessel B

According to the statement of Master B and Chief fisherman B (2.1.3(2)), it is probable that Vessel B was away from accident location and waiting until becoming calm of sea, because this vessel was damaged with hole and it might flood if the she continue to sail under the rough sea condition.

(3) Vessel C, D and E

According to the statement of the Chief fisherman C, Chief fisherman D and Chief fisherman E (2.1.3(3)~(5)), it is probable that Vessel C, D and E went to accident location when they knew accident occurrence, and then, they conducted search and rescue of crews of Vessel A.

3.2 Causal factors of the Accident

3.2.1 Situation of Crews

As described in 2.4, the Certificate of Competence held by Master A and Officer A2 and the health status of both are unknown. Also, Master B and Chief fisherman B held legal and valid Certificate of Competence, and Chief fisherman B held a certification of qualification as a member of the deck department's navigation duty department, respectively. Their health were also good.

3.2.2 Situation of Vessel

The JTSB concludes that the situation of Vessel A and Vessel B was follows;

(1) Vessel A

As described in 2.5.5(1), Officer A1 stated that there were no defects or failures in the hull of Vessel A, main engine and equipment. However, as described in 3.1.1, it is probable that the heading of Vessel A after 22:07:10 in the AIS record was not correctly recorded at that time of accident occurred. In this regard, although it was likely that navigation equipment had defects or failures, since the vessel A had sunk and crews except Officer A was missing, the detail is unknown.

(2) Vessel B

It is probable that there were no defects or failures in the hull of Vessel B, main engine and equipment.

3.2.3 Weather and Sea Conditions

With regard to the weather and sea condition of in the vicinity of the accident site of off the east coast of Nakayamazaki, Rokkasho Village, according to the result of observation (2.6.1) and statement for weather condition from Officer A1, Chief fisherman B, Chief fisherman C and Chief fisherman D (2.6.2), it is probable that the weather was sleet or rain, wind scale was 4 (wind speed 5.5 m/s to 7.9 m/s) to 5 (wind speed 8.0 m/s to 8.0 m/s) of south-east, wave direction was east-south-east, wave height was 2m-3m, visibility was

20km and the sea surface temperature was around 8°C.

3.2.4 Analysis regarding lookout and Ship Maneuvering

The JTSB concludes that the lookout and Ship Maneuvering for Vessel A and B were as follows:

(1) Vessel A

- i) According to the statement of Officer A1 (2.1.2(1)) and the Watch keeping Arrangement of vessel A (2.7.1), the Officer A2 was take over the navigational watch on duty from Officer A1 at around 20:50. At that time of the accident occurrence, it is probable that the Officer A2 commanded navigation operation and Ordinary Seaman conducted the lookout and steering operation.
- ii) According to the statement regarding the ship track of vessel A viewed from Vessel B of Chief fisherman B(2.1.2(2)) and events leading to the accident between vessel A and Vessel B(3.1.3), it is probable that the Vessel A was sailing toward north off the east of Nakayamazaki Rokkasho Village toward the Republic of Korea and Officer A2 turned to starboard at about 21:52, and the Vessel A continued to sail toward north-north-east which was east side of an extended course of Vessel B.
- iii) According to the statement regarding the ship track of vessel A viewed from Vessel C of Chief fisherman C(2.1.2(3)) and events leading to the accident of Vessel A(3.1.3), it is probable that although Vessel A was sailing toward north-north-east, since the distance from vessel C which was sailed forward port side of Vessel B became around 0.6M, vessel A was turned to port exponentially by officer A2 at around 22:07.
- iv) According to the events leading to the accident between vessel A and Vessel B (3.1.3), it is probable that the Vessel A was turn to port until the direction of north-west which was course on vessel B, and it was finished to turn to port at around 22:08, and then, the Vessel A started to sail toward north-west, and she was turned to port again by Officer A2 at around 22:09 in order to escape to collision with vessel B.
- v) According to the statement of Officer A1 of the situation of lookout using the radar until taking over the navigational watch to Officer A2 (2.1.2(1)), the statement of the ship track of vessel A by radar and lookout of Chief fisherman B, C, D and E(2.1.2(2)~(5)), and situation of visibility of Vessel A at that time of accident occurrence as described(3.2.3), it is probable that the Vessel A was no external factor in prevention of monitoring of movement of other vessel and lookout.

(2) Vessel B

- i) According to the statement of Chief fisherman B in 2.1.2(2) and the events leading to accident occurrence between Vessel A and Vessel B as described in 3.1.3, the Chief fisherman B was navigational watch on duty alone after finished fishing operation, and the vessel started to sail toward south by autopilot at around 19:31, Chief fisherman B was sitting on a chair and watching the fish finder located at the lower of the steering table under sailing, he found the Vessel A on the radar.

When the distance between vessel A and Vessel B became less than 3M and Chief fisherman B confirmed the status of light of Vessel A, since it seemed that Vessel A sailed around 020° on the course, he believed that Vessel A could pass in forward of the Vessel B safely and Vessel A can pass port to port with Vessel C. Therefore, it is probable that vessel B continued to sail toward south at same ship's speed.

- ii) It is probable that the Chief Fisherman B was watching the fish finder continuously, he could not find out Vessel A which was turned to port and approached Vessel B, and Vessel B continued to proceed to sail at the same course and speed.

3.2.5 Analysis of VHF communications

According to the statement of Chief fisherman B (2.1.2(2)) and statement of Chief fisherman D, the JTSCB concludes that there was no communication by VHF between vessel A and Vessel B.

3.2.6 Analyses of Accident Occurrence

According to 3.2.1 through 3.2.5 above, the JTSCB concludes that the factors of the accident occurrence were as follows.

(1) Vessel A

- i) Vessel A was sailing north-ward off the east coast of Shimokita Peninsula toward the Republic of Korea during influenced by 4~5 of wind power from south-east and 2~3m of wave height from east-south-east. Around 21:52, Vessel A was turned to starboard by Officer A2 who commanded navigation operation, and continued to sail toward north-north-east which was east side of an extended course of vessel B. When the distance between Vessel A and Vessel C was less than 0.6M, it is probable that Vessel A was turned to port exponentially and started to sail toward north-west and Vessel A was turned to port again and collided with Vessel B at around 22:09.
- ii) With regard to the lookout, monitoring of ship track of other vessel and intent of the operation of the Vessel A of Officer A who commanded navigation operation at that time of the accident, since the Officer A2 was disappearance, the detail was unknown.
- iii) With regard to the AIS record of Vessel A, since it is probable that the heading status of Vessel A was not clearly recorded at that time of the accident, it was likely that the navigation equipment may have defects or failures. However, since Vessel A had sunk and the crews except Officer A1 were disappearance, it could not clearly investigate that the involvement of navigation equipment in the accident occurrence.

(3) Vessel B

For Vessel B, while Vessel B was sailing toward south together with Vessel C, Vessel D and Vessel E from fishing ground to home port, when the distance between Vessel A and Vessel B was less than 3M, Chief fisherman B confirmed the status of lighting of Vessel A. It seemed that Vessel A was sailing around 020° on the course,

Chief fisherman B believed that Vessel A could pass in forward of the Vessel B safely and Vessel A could pass port to port with Vessel C. After that, since Chief Fisherman B was watching the fish finder continuously, he could not find out that vessel A turned to port and approached to vessel B, and Vessel B continued to sail toward south at the same course and same speed. In view of the above, it is probable that the Vessel B and Vessel A had collided.

3.3 Analysis of Abandon Ship, Rescue of Fallen Person in Water and Mitigation of Damage
JTSB concludes that the Abandon Ship, Rescue of Fallen Person in Water and Mitigation of Damage were as follows:

- (1) With regard to the reason that Vessel A was not abandoned by using liferaft, according to the speed over the ground after 22:10:00 in AIS record (2.1.1 table 1) and the status of flooding/sinking of Vessel A described in 3.1.9(1), Vessel A could not keep maneuvering and main engine could not also stop after collision, and she was sailing ahead continuously during inclining to fore side. Therefore, it is probable that it was difficult to abandon ship by liferaft which was assumed to launch the liferaft under stopping engine.

Also, as described in 2.1.3 (3) ~ (5), although Chief fisherman C, D and E was sighting and recovery these liferafts, as already stated, it is likely that the crews of Vessel A could not launch the liferaft. Therefore, it is probable that the automatic release device for container containing liferaft was operated by water pressure, container going off from the vessel, the liferaft was released and drifting on sea surface when the Vessel A had sunk.

- (2) With regard to the disappearance of crews of Vessel A except Officer A1, it is likely following reasons.
 - According to the sea water temperature considering below 10°C at around accident state (2.6.1(3)) and SOLAS Training Manual as described in 2.9, the hours a human being can maintain consciousness in water is about below 2 hours in case of estimation survivable hours dressed in normal clothes and sea water temperature below 10 °C.
 - According to the value of weather observation in 2.6.1(1) & (2), status of crews of Vessel A in 3.1.10(1) and no finding information of the crews of Vessel A except Officer A which was found by Chief fisherman C & E.
 - When Vessel A started to sink, many crews including Officer A1 were wearing lifejacket and moved to aft side of the vessel and some crews were stayed on navigation bridge. After that, crews were fallen in the sea from vessel, and they were swept away from the accident site by strong winds and waves from the south-east.
 - Since the crews except Officer A1 were decreased body temperature and lost consciousness, they could not call the rescue and was disappearance.
- (3) After 30 minutes of sinking of Vessel A, the reason why Officer A1 was find and rescue at north-north-east of around 630m away from Vessel A's sinking site, it was likely that Officer A1 turned on the light of lifejacket and held on to the floating oil tank

(3.1.10(1)). However, since crews of vessel A except Officer A1 were disappearance, the difference of situation between Officer A1 and other crews were unknown, and the detail of oil tank which was held on by Officer A1 were unknown. Also, it was not possible to determine whether or not the oil tank supported Officer A1 survival.

(4) Reason why the Vessel A, D and E which searched and rescued of Vessel A could not find the crews of Vessel A except Officer A1, it is likely that the search and rescue of vessel A were very difficult as follows;

- The accident was occurred at night (3.1.4) and sea was stormy at that time of Accident occurrence (3.2.3).
- Vessel A had sunk immediately after Vessel C and D arrived near the accident state, and the mooring cable and other items on board Vessel A became dangerous floating objects and it was floating on sea surface.
- Since there had dangerous that propeller and propeller shaft of Vessel C, D and E engulfed the floating objects, it was necessary to search carefully of floating objects by searchlight shining on the sea surface (2.1.3(3)~(5) and 3.1.10).

4. Probable Causes

The JTSB concludes that the probable cause of this accident was that, when Vessel A was heading north toward the Republic of Korea and Vessel B was heading south toward Hachinohe Port after fishing operation at off the east coast of Nakayamazaki Rokkasho Village, during night, since Vessel A turned to starboard and sailing the course which was east side of extended course of Vessel B and Vessel A approached around 0.6M to Vessel C which was forward sailing toward south of east side of vessel B, Vessel A turned to port exponentially and sailing toward north-west under same speed and Vessel B was also sailing same course and speed continuously. Therefore, it is probable that two vessels were collided.

It is probable that Vessel A turned to port exponentially and sailing toward north-west under same speed after heading to the east of the extended course of Vessel B in order to avoid to collider with Vessel C. However, since the Officer A2 who was navigational watch on duty of Vessel A was disappearance, it could not be determined why especially the cause to turn to port exponentially.

When Chief fisherman B saw two lights of which were red light (port side light) and masthead light, he seemed that Vessel A sailed around 020° on the course. Since he believed that Vessel A could pass in forward of the Vessel B safely and Vessel A could pass port to port with Vessel C, Chief Fisherman B was watching the fish finder continuously and he could not find to be approach from Vessel A. Therefore, it is probable that Vessel B was sailing continuously under same speed and same course.

5 SAFETY ACTIONS

When Vessel A was heading north toward the Republic of Korea and Vessel B was heading

south toward Hachinohe Port after fishing operation at off the east coast of Nakayamazaki Rokkasho Village, during night, since Vessel A turned to starboard and sailing the course which was east side of extended course of Vessel B and Vessel A approached around 0.6M to Vessel C which was forward sailing toward south of east side of vessel B, Vessel A turned to port exponentially and sailing toward north-west under same speed and Vessel B was also sailing same course and speed continuously. Therefore, it is probable that two vessels were collided.

Also, since Vessel A was not abandoned by using life raft and the crews of vessel A were fallen in sea which sea temperature was below 10°C, it is probable to be one of the reasons why the damage was expanded.

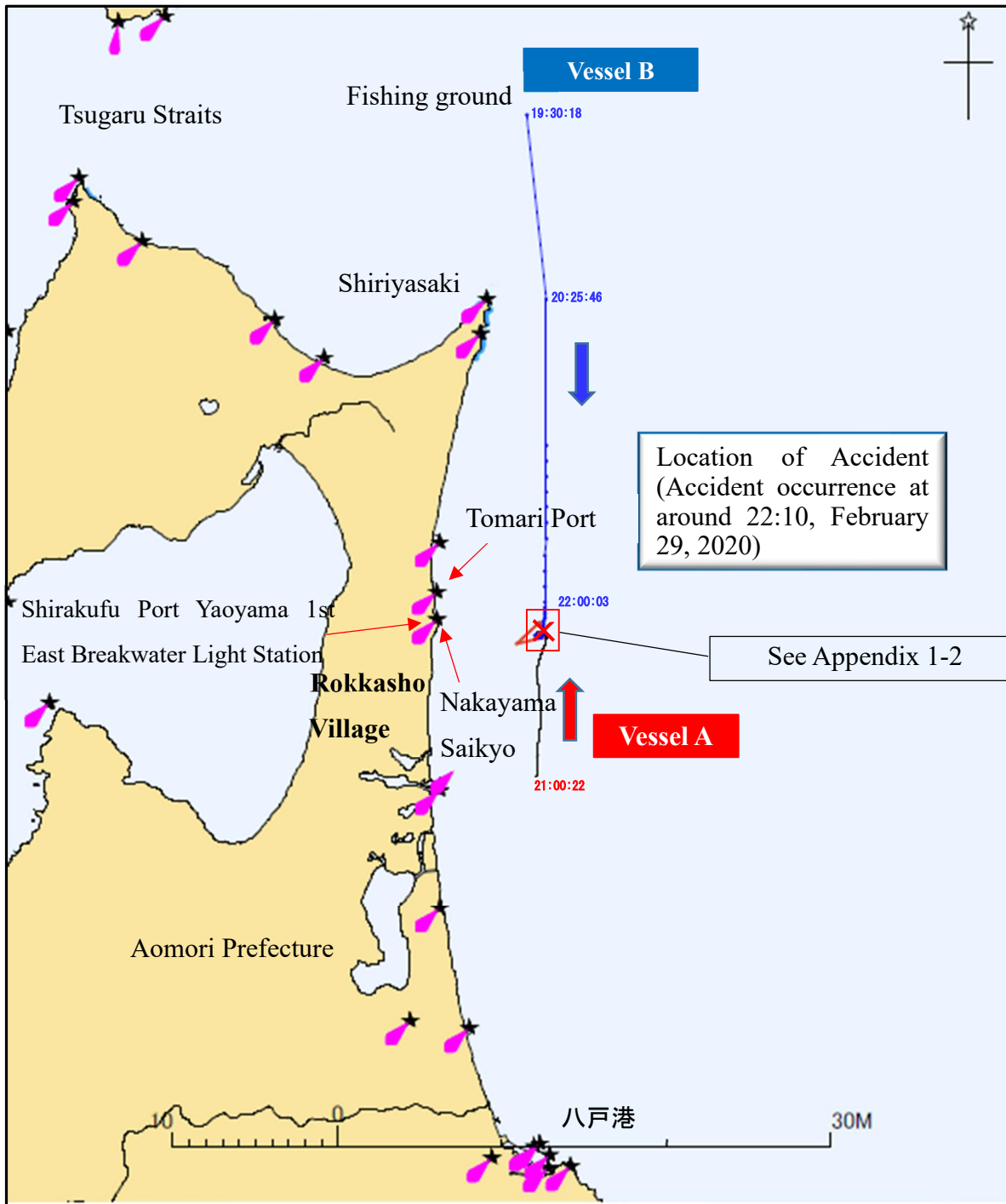
Therefore, master and navigational watch officer should be following measures in order to prevent the recidivating similar accidents and mitigate the damage caused by the accident.

- (1) Navigational watch person (Officer) should confirm the surroundings of the vessel properly using radar etc., if they take action to avoid collision with other vessel, it should take care that the vessel does not approach to other vessel such as the course should be substantially changed and speed should be substantially decreased.
- (2) If navigational watch person (Officer) see other vessel which is approached to this vessel, they should properly monitor the movement of another vessel until the vessel passes, even if the situation of two vessels can safely pass each other.
- (3) If navigational watch person (Officer) see several vessels which are sailing same course without distance each other, since it may difficult to avoid from other vessels when the vessel enter in the extended course of other vessels, the vessel should be away from course of other vessels as soon as possible.
- (4) If the vessel flood during to sail by accidents, master should stop the running of Main Engine immediately and judge of status of the danger. If the vessel is in danger, master should order and action to abandon from ship.

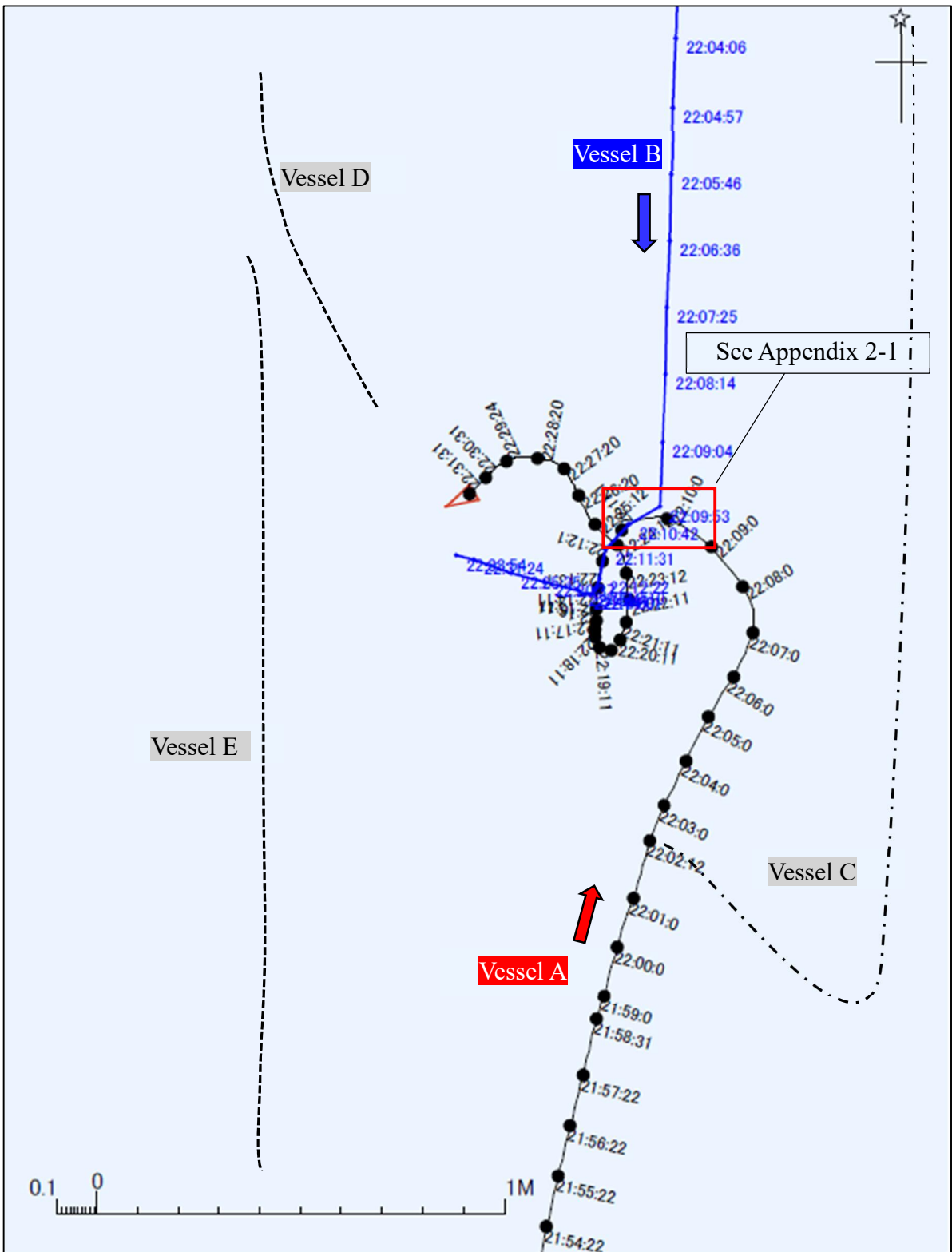
If the abandon ship is ordered, crews should wear clothing possible to prevent loss of body heat and wear life jackets (or carry them if there is no time to put them on). In addition, the equipment listed on Master List (EPARB, radar transponder and other radio life-saving equipment, blankets and other cold protection equipment, food and drinking water, and designated documents) should carry and go to designated master station.

The master of the vessel shall ensure that the crews are familiar with the life-saving appliances on board, such as life rafts, immersion suits, radio life-saving appliances, etc., and that they are proficient in their use.

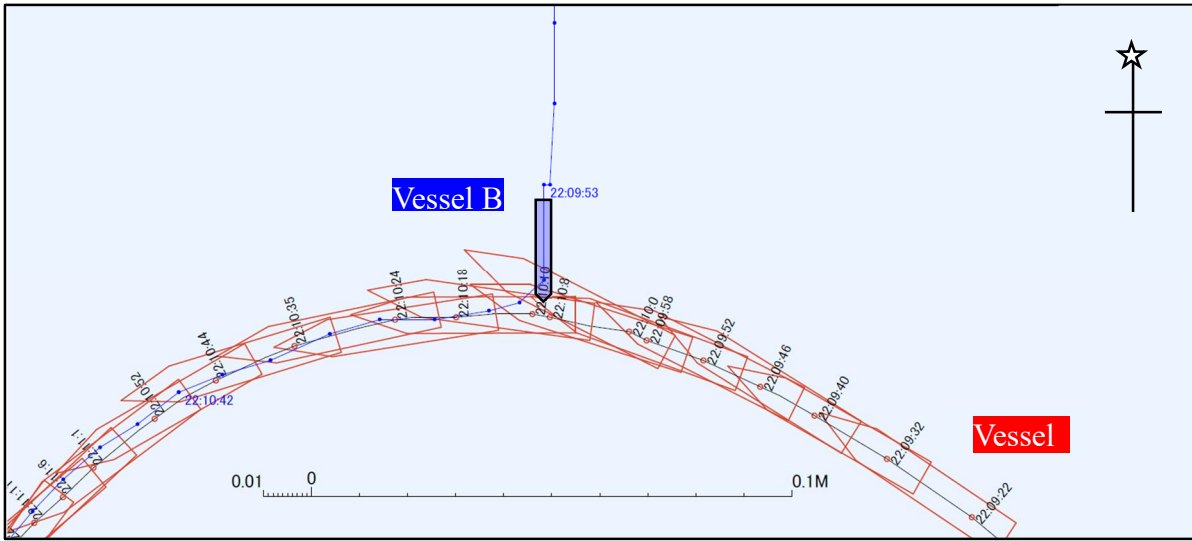
Appendix 1-1 Diagram of estimated navigation route



Appendix 1-2 Diagram of estimated navigation route (Enlarged)



Appendix 2-1 Diagram of situation of collision (Enlarged)



Appendix 2-2 Ship's truck of both vessels after collision (until 22:14)

