MA2023-10

MARINE ACCIDENT
INVESTIGATION REPORT

September 28, 2023

Japan Transport Safety Board

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 WAKASHIO
IMO NUMBER: 9337119
Gross tonnage: 101,932 tons

Accident/Incident type: Grounding
Date and time: Around 19:25 on July 25, 2020 (local time)
Location: Shallows off the southeast coast of the island of Mauritius, Republic of Mauritius
(approximately 20°26.5′S, 057°44.7′E)

September 6, 2023
Adopted by the Japan Transport Safety Board
Chairman TAKEDA Nobuo
Member SATO Yuji
Member TAMURA Kenkichi
Member SOUDA Hisako
Member OKAMOTO Makiko

SYNOPSIS

＜**Summary of the Accident**＞

The cargo ship M/V WAKASHIO (“the Vessel”), with a master and 19 other crew members aboard, was sailing to the Port of Tubarão in the Federative Republic of Brazil when she ran aground on shallows off the southeast coast of the island of Mauritius, Republic of Mauritius, at around 19:25 on July 25, 2020 (Mauritius Time).

Although there were no fatalities or injuries to the crew, the Vessel’s hull buckled and sustained other damage and, subsequently, fuel oil spilled from a rupture caused by the occurrence and spreading of cracks that resulted from the buckling, contaminating the southeastern coast of the island.

＜Probable Causes＞

(1) Probable Cause of the Accident

It is probable that the cause of the Accident was that, as the Vessel was proceeding west-southwest off to the east-northeast of Mauritius without obtaining Charts, etc., showing detailed representations of the coastline and other features of Mauritius, the Master changed the passage plan and the Master and Chief Officer continued navigating on a course approaching shallows in the island’s southeast region with their attention drawn to smartphone transmission, and consequently the Vessel grounded on the shallows.

It is probable that the Master changed the passage plan in order to take a course approaching Mauritius for the purpose of receiving a smartphone signal.

It is probable that the Vessel did not obtain detailed Charts, etc., for the area around Mauritius because the Master thought they were unnecessary, as the Vessel was not scheduled to enter port at Mauritius.

It is probable that the Vessel had repeatedly approached land, etc., in the past to receive a smartphone signal, and that low awareness with respect to safe navigation and a higher risk acceptability among the crew as a whole were involved in the occurrence of the Accident.

(2) Probable Cause of the Damage (Release of Fuel Oil)

It is probable that the cause of the damage was that, under conditions in which it took at least five days for tugboats to arrive after the grounding, and which even after their arrival, the tugboats were unable come alongside the hull and join a tug line due to worsening sea conditions, the Vessel’s hull buckled after striking against the seafloor, causing a rupture in the plating shell near a fuel oil tank, and consequently approximately 1,000 tons of fuel aboard remaining in the tank spilled onto the sea surface and polluted the coasts of southeastern Mauritius.

It is probable that Mauritius’s regional circumstances, worsening sea conditions, and the effects of COVID-19-related isolation measures were involved in the release of fuel oil from the rupture caused by the hull’s buckling and the spread of damage caused by the oil spill.

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1 PROCESS AND PROGRESS OF THE INVESTIGATION

1.1 Summary of the Accident

The cargo ship M/V WAKASHIO (hereinafter referred to as "the Vessel"), with a master and 19 other crew members aboard, was sailing to the Port of Tubarão in the Federative Republic of Brazil when she ran aground on shallows off the southeast coast of the island of Mauritius, Republic of Mauritius, at around 19:25 on July 25, 2020 (Mauritius Time [*1]).

Although there were no fatalities or injuries to the crew, the Vessel's hull buckled [*2] and sustained other damage and, subsequently, fuel oil spilled from a rupture caused by the occurrence and spreading of cracks that resulted from the buckling, contaminating the southeastern coast of the island.

1.2 Outline of the Accident Investigation

1.2.1 Background and Significance of the Investigation

In light of the fact that the Accident falls under the classification of "very serious marine casualty" of the Casualty Investigation Code, which is predicated on the SOLAS Convention,[*3] because it includes serious environmental damage, and of the fact that the management company and the charterer of WAKASHIO are Japanese companies, it was decided that the Japan Transport Safety Board would conduct an investigation this Accident, including an onsite investigation, after discussions held with the Republic of Panama (flag state of WAKASHIO) and the Republic of Mauritius (coastal state where the Accident occurred) concluded with an agreement from the Republic of Panama on August 19, 2020, and from the Republic of Mauritius on September 3, 2020, that Japan will be a state to conduct the marine safety investigation as a substantially interested state based on the Code.

When a vessel has an accident at sea in the territorial waters of a coastal state, the investigation of the accident is ordinarily conducted by the vessel's flag state and the coastal state concerned. This accident investigation was the first case in which Japan conducted an investigation as a substantially interested state based on the Code, and it exemplified the spirit of international cooperation promoted by the Code.

It should be noted that the smooth and efficient implementation of this accident investigation in the midst of the novel coronavirus infectious disease[*4] pandemic was largely due to the understanding and cooperation provided by the government of the Republic of Mauritius.

1.2.2 Setup of the Investigation

The Japan Transport Safety Board appointed an investigator-in-charge and four other marine accident investigators to investigate this accident on September 18, 2020. JTSB member Yuji Sato and four marine accident investigators were dispatched to the Republic of Mauritius to conduct the investigation.

1.2.3 Collection of Evidence

September 18, 2020; January 14, 18, 19, 20, 25, and 28, February 1, 19, and 20, March 4, 9, 16, 22, and 30, April 5 and 15, June 3, July 1, 7, 12, and 31, August 3, 10, 11, 12, 13, and 16, September 1, 2, 8, and 18, October 9, November 1, 2, 5, 10, 11, 15, 17, 24, and 26, and December 4, 16, 20, 21, 22, 23, 24, 25, and 29, 2021; January 3, 5, 13, and 17, May 22, November 8, and December 19, 2022; and February 10 and March 9, 2023: Collection of questionnaire

September 24, 28, and 29, October 1, 6, 9, 12, 13, 15, and 16, and December 25, 2020; April 14, May 13, and July 27, 2021; and February 9 and April 5, 2023: Interview

October 2, 5, and 9, 2020; January 8, February 17 and 18, and October 14, 2021: Interview and collection

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[*1] Mauritius Time is a standard time that is four hours ahead of Coordinated Universal Time (UTC) (five hours behind Japan Standard Time).

[*2] "Buckling" refers to a phenomenon that occurs when a load (mainly compression) on a structure is gradually increased, equilibrium becomes unstable at a certain load, and major deflection occurs rapidly, resulting in a sudden loss of bearing force.

[*3] The International Convention for the Safety of Life at Sea (SOLAS Convention)

[*4] "Novel coronavirus infectious disease" refers to COVID-19, which is the official international designation given to the disease by the World Health Organization (WHO). The disease began spreading worldwide in the beginning of 2020 and resulted in a global pandemic by infecting more than 600 million people by August 2022.

of questionnaire
October 7 and 14, 2020: Interview and on-site investigation

1.2.4 Interim Report and Opinions pursuant to Article 28 of the Act for Establishment of the Japan Transport Safety Board

On June 30, 2022, an Interim Report based on the results of the fact-finding investigation conducted up to that point was submitted to the Minister of Land, Infrastructure, Transport and Tourism, and opinions on measures that should be taken to prevent the occurrence of similar accidents were presented and made public.

1.2.5 Comments from Parties Relevant to the Cause

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

1.2.6 Comments from the Flag State, etc.

Comments were invited from the Republic of Panama and the Republic of Mauritius.

2 FACTUAL INFORMATION

2.1 Events Leading to the Accident

2.1.1 Navigation Track According to the Automatic Identification System

According to the "data record of the Automatic Identification System (AIS)[*5] of the Vessel that was received by a private company" (hereinafter referred to as "the AIS Record"), the navigation route of WAKASHIO (hereinafter referred to as "the Vessel") between 13:06 and 19:32 on July 25, 2020 (Mauritius Time; hereinafter the same unless otherwise stated) was as shown in Table 1.

The Vessel's position is the position of the GPS antenna that was installed on top of the bridge. Heading and course over the ground are true bearings.

Table 1 AIS Record (excerpt)

Time (HH:MM:SS)		Position		Course Over the Ground (°)	Heading (°)	Speed Over the Ground [*6] (knots [kn])
		Latitude (S)	Longitude (E)			
Mauritius Time	UTC	(°-′-″)	(°-′-″)			
13:06:29	09:06:29	19-54-14.4	058-53-40.8	242	239	11.4
13:12:35	09:12:35	19-54-46.2	058-52-34.8	243	239	11.6
13:17:17	09:17:17	19-55-11.1	058-51-41.4	244	239	11.6
13:20:56	09:20:56	19-55-30.4	058-51-01.1	243	239	11.6
13:39:52	09:39:52	19-57-07.9	058-47-32.5	244	241	11.7
13:46:36	09:46:36	19-57-40.2	058-46-19.8	244	241	11.4
13:52:34	09:52:34	19-58-11.2	058-45-10.4	245	241	11.8
14:00:30	10:00:30	19-58-47.4	058-43-43.0	246	241	11.6
14:09:04	10:09:04	19-59-30.2	058-42-07.5	243	240	11.4
14:13:00	10:13:00	19-59-49.3	058-41-22.8	247	241	11.5
14:26:23	10:26:23	20-00-51.6	058-38-55.8	246	241	11.4
14:31:34	10:31:34	20-01-18.4	058-37-55.3	244	241	11.4
14:40:13	10:40:13	20-02-00.1	058-36-19.7	245	241	11.7
14:55:18	10:55:18	20-03-12.7	058-33-29.6	245	241	11.2

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

[*6] "Speed over the ground" refers to the speed of a vessel as measured against one point on the earth's surface. The speed of a vessel as measured against the water in which the vessel is traveling is called "speed over water".

15:01:09	11:01:09	20-03-39.5	058-32-26.2	245	241	11.3
15:10:06	11:10:06	20-04-22.1	058-30-46.9	245	241	11.4
15:20:04	11:20:04	20-05-08.8	058-28-57.1	245	241	11.5
15:30:02	11:30:02	20-05-54.6	058-27-06.8	245	241	11.0
15:40:09	11:40:09	20-06-41.4	058-25-15.2	246	241	11.6
15:50:02	11:50:02	20-07-40.7	058-22-49.1	246	241	11.7
16:00:32	12:00:32	20-08-16.8	058-21-23.2	246	240	11.6
16:09:02	12:09:02	20-08-58.3	058-19-46.4	246	241	11.6
16:13:45	12:13:45	20-09-21.8	058-18-50.0	246	241	11.3
16:20:23	12:20:23	20-10-05.1	058-17-05.5	246	241	11.6
16:29:41	12:29:41	20-10-35.7	058-15-51.2	245	241	11.8
16:41:44	12:41:44	20-11-31.9	058-13-34.0	246	241	11.5
16:44:44	12:44:44	20-11-46.2	058-13-00.2	245	241	11.7
16:50:33	12:50:33	20-12-13.8	058-11-54.1	245	240	11.6
16:55:04	12:55:04	20-12-35.2	058-11-03.2	245	241	11.6
17:00:32	13:00:32	20-12-59.3	058-10-00.9	245	241	11.7
17:04:04	13:04:04	20-13-18.5	058-09-21.0	245	241	11.7
17:11:13	13:11:13	20-13-54.5	058-07-56.6	246	241	12.0
17:15:05	13:15:05	20-14-13.2	058-07-11.8	246	241	11.8
17:20:09	13:20:09	20-14-35.5	058-06-17.2	246	241	11.6
17:30:10	13:30:10	20-15-24.4	058-04-20.7	245	241	11.8
17:35:28	13:35:28	20-15-49.6	058-03-20.0	245	241	11.8
17:40:12	13:40:12	20-16-11.4	058-02-28.3	246	241	11.5
17:45:02	13:45:02	20-16-35.0	058-01-33.1	244	241	11.9
17:49:02	13:49:02	20-16-55.2	058-00-47.5	244	239	12.0
17:50:44	13:50:44	20-17-05.3	058-00-26.8	241	238	11.9
17:51:16	13:51:16	20-17-08.3	058-00-21.1	241	237	11.8
17:52:45	13:52:45	20-17-17.1	058-00-04.6	240	235	11.9
17:55:05	13:55:05	20-17-31.0	057-59-39.5	239	235	11.7
18:01:34	14:01:34	20-18-10.7	057-58-31.9	237	235	11.6
18:15:45	14:15:45	20-19-37.4	057-56-03.3	238	234	11.4
18:30:46	14:30:46	20-21-10.1	057-53-25.7	238	234	11.1
18:35:33	14:35:33	20-21-37.6	057-52-38.0	237	234	10.8
18:41:03	14:41:03	20-22-09.3	057-51-43.6	239	234	10.8
18:45:56	14:45:56	20-22-30.8	057-50-55.7	238	234	10.8
18:50:33	14:50:33	20-23-13.1	057-49-53.9	237	234	10.6
18:55:35	14:55:35	20-23-33.6	057-49-19.8	237	234	10.8
19:00:18	15:00:18	20-24-00.3	057-48-35.8	237	234	10.9
19:03:10	15:03:10	20-24-17.0	057-48-07.5	237	234	10.9
19:13:20	15:13:20	20-25-19.3	057-46-25.4	236	232	10.8
19:14:19	15:14:19	20-25-25.3	057-46-15.9	236	233	10.7
19:15:20	15:15:20	20-25-31.2	057-46-06.5	236	232	10.6
19:22:52	15:22:52	20-26-17.0	057-45-00.2	228	225	10.2
19:25:03	15:25:03	20-26-31.7	057-44-44.5	223	227	9.4
19:26:13	15:26:13	20-26-38.6	057-44-36.5	227	228	8.7
19:27:22	15:27:22	20-26-39.2	057-44-35.8	230	230	1.7
19:28:46	15:28:46	20-26-39.1	057-44-35.6	262	239	0.2
19:29:55	15:29:55	20-26-38.7	057-44-35.2	322	242	0.3
19:32:24	15:32:24	20-26-39.1	057-44-35.3	170	260	0.0

2.1.2 Record of the Voyage Data Recorder

According to the "data record of the Voyage Data Recorder (VDR)[*7]" (hereinafter referred to as the "the VDR Record") of the Vessel, the situations concerning the set course, number of main engine revolutions, and voice communication on the bridge, etc., of the Vessel from 16:00 on July 25 were as follows.

(1) Set course of auto pilot

Changes in the set course, etc., of the auto pilot were as follows.

Time	16:00 to 17:46	17:47 to 17:58	17:59 to 19:18	19:19 to 19:21	19:22 to 19:26	19:27
Set course, etc.	241°	239° - 233°	234°	229°	227°	Changed to manual steering

(See Annex Table 1 Course Changes (July 20 to July 25) and Annex Table 2 Course Changes (July 25, 17:30 to 19:26))

(2) Number of main engine revolutions and speed

1) Number of main engine revolutions

Changes in the number of main engine revolutions were as follows.

Time	Around 16:00 to 18:24	Around 18:25 to 19:25
Revolutions per minute (rpm)	Approx. 70 - 76	Approx. 64 - 71

2) Speed

Changes in speed were as follows.

Time	Around 16:00 to 18:23	Around 18:24 to 19:24	Around 19:25 to 19:27
Speed (kn)	12.8 - 11.0	12.4 - 10.0	9.0 - 0.2

(See Annex Table 3 Changes in Number of Revolutions and Speed (16:00 to 19:26))

(3) Record of voice communication

Information on main voice communication on the bridge between around 16:02 and around 20:14 is as shown in Annex Table 4.

The Master and the crew conversed mainly in English, while crew members of Republic of India nationality conversed with each other in Hindi.

(See Annex Table 4 VDR Voice Communication (Excerpt))

(4) Information on main engine operation

The position of the engine telegraph between around 16:00 and around 19:56 was as follows.

Time (HH:MM:SS)	Engine telegraph position
16:00:00	Nav. Full
19:27:45	Full
19:28:45	Stop Engine
19:31:00	Dead Slow Astern
19:31:30	Slow Astern
19:32:30	Half Astern
19:34:30	Full Astern
19:56:30	Dead Slow Astern
19:56:45	Stop Engine

[*7] "Voyage Data Recorder (VDR)" is an instrument that is able to record the position, course, speed, radar information and other data about navigation as well as communication by VHF radio telephone and voices in the bridge.

2.1.3 Statements of the Crew Members, etc.

According to the statements of the Vessel's master (hereinafter referred to as "the Master"), three navigation officers (Chief Officer, Second Officer, and Third Officer; hereinafter referred to as "Navigation Officer A_1," "Navigation Officer A_2," and "Navigation Officer A_3," respectively), Deck Cadet (hereinafter referred to as "Cadet"), Chief Engineer, Second Engineer, and Mess Man; information provided by the Ministry of Blue Economy, Marine Resources, Fisheries & Shipping[*8] of the Government of the Republic of Mauritius (hereinafter referred to as "Ministry of Blue Economy"); and the reply to the questionnaire by Nagashiki Shipping Co., Ltd., which is the Vessel's management company (hereinafter referred to as "Company A"), the events leading up to the Accident were as follows.

(1) Description of navigation from departure from Singapore (July 14) to the day before the Accident (July 24)

At around 09:00 on July 14, 2020 (Singapore Standard Time[*9]) , the Vessel departed from her anchorage in the Port of Singapore, Republic of Singapore, for the Port of Tubarão, Federative Republic of Brazil, with the Master (national of India), Navigation Officer A_1 (national of the Democratic Socialist Republic of Sri Lanka), Navigation Officer A_2 (national of the Republic of the Philippines), and 17 other crew members (two nationals of India and 15 nationals of the Republic of the Philippines) aboard.

The Vessel continued navigating based on a passage plan that had been prepared by Navigation Officer A_2 and approved by the Master and, after passing the Strait of Malacca, passed a veering point off to the northwest of Sumatra, Republic of Indonesia, at around 09:00 on July 16 (Western Indonesia Time[*10]) and entered the Indian Ocean. (See Figure 1)

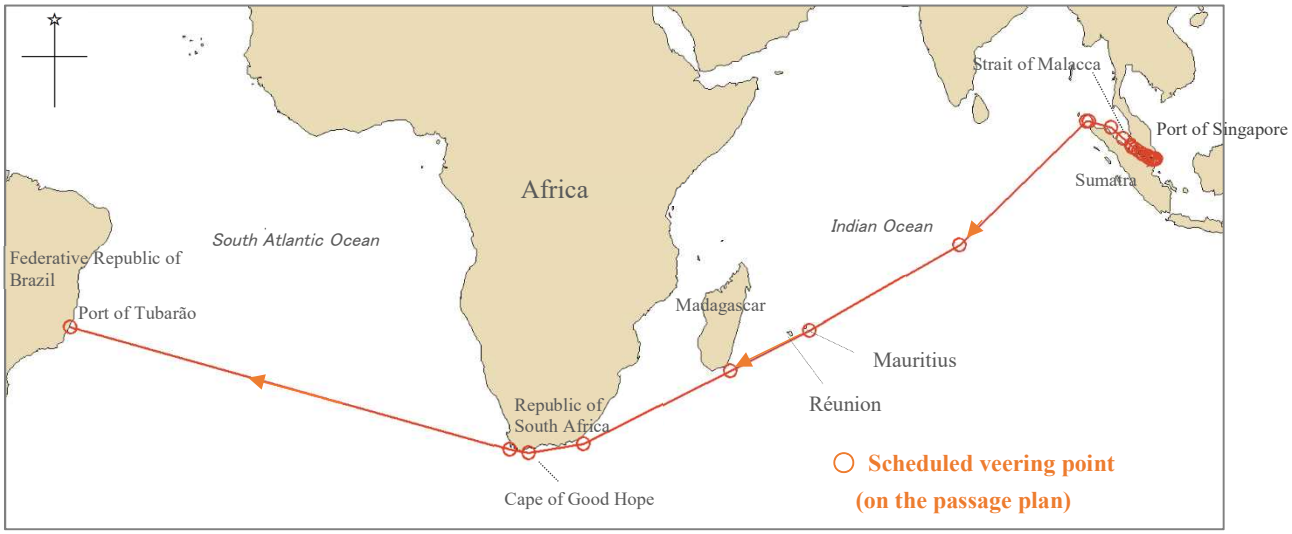

Figure 1 Sailing Noted in the Passage Plan (Shown on a Map)

As the Vessel was navigating southwest in the Indian Ocean on July 23, the Master instructed Navigation Officer A_2, who was on bridge watch, to change course so as to come to within about five nautical miles (M) from the coast of Mauritius, which the Vessel was scheduled to pass two days later on July 25, for the purpose of picking up a smartphone signal. Navigation Officer A_2 set the veering point on the screen of the Electronic Chart Display and Information System (ECDIS)[*11] so that the distance from Mauritius's shore, which was about 22 M of the passage plan

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[*8] The Ministry of Blue Economy, Marine Resources, Fisheries & Shipping is an administrative body of the Government of Mauritius that oversees the protection of marine resources, marine transportation, and fishing.

[*9] Singapore Time is a standard time that is eight hours ahead of Coordinated Universal Time (UTC).

[*10] Western Indonesia Time is a standard time that is seven hours ahead of Coordinated Universal Time (UTC).

[*11] An Electronic Chart Display and Information System (ECDIS) is a device that displays ENCs on a monitor. It can superimpose the position of the ECDIS-installed vessel, its planned route, and other information on the display and has a warning function that notifies the crew of approaching shoal and other features that have been entered into the system.

he had prepared, would be 5 M off the coast and then changed course toward that point.

(2) Description of navigation on the day of the Accident (July 25)

At around 08:00 on July 25, the Master went to the bridge and checked the Vessel's operation while doing administrative work on the bridge. At around 13:15, he ordered Navigation Officer A_2 to change the course from 239° to 241° (heading; hereinafter the same) to come closer to Mauritius. Navigation Officer A_2 felt uneasy because if the Vessel approached Mauritius without a detailed Electric Navigational Chart (ENC)[*12] for the island's vicinity, information on water depth, shoal, etc., would not be displayed on the Electronic Chart Display and Information System (ECDIS). However, because the order had come from the Master, he changed course to 241° and continued navigating.

He handed over the course of 241° to Navigation Officer A_1, who had the next watch, at around 16:00. At that time, Navigation Officer A_1 observed on the ECDIS that the Vessel was sailing on the northern side of the planned course line.

Navigation Officer A_1 had planned to have the Cadet who would come up to the bridge from 18:00 take charge of lookout during the watch. However, because a crew member's birthday party was scheduled to be held in the crew's messroom from around 17:00, he told the Cadet, with the permission of the Master, to join the party and assumed bridge watch alone.

At around 16:00, the Master observed Mauritius off the starboard bow and learned by checking the radar that the distance from the Vessel to the veering point off the island's coast was about 40 M.

At around 16:00, the Mess Man, who had been engaged in cooking and other duties on board, went out onto the deck to clean up waste and thought it was strange that the land, which had been visible off to the Vessel's side when the Vessel approached land during previous coastal passages, appeared to be in the Vessel's direction of travel.

At around 17:00, the Master, while pointing at the intersection the scheduled course of 241° and the line of 058° east longitude on the ECDIS screen, told Navigation Officer A_1, who was on bridge watch, to change course to 240° when the Vessel reached that point, and then he temporarily left the bridge to join the birthday party.

At around 17:48, the Vessel reached the point indicated by the Master and therefore Navigation Officer A_1 altered the course to 234°, giving consideration to the wind and tidal current.

The Master joined the birthday party and was chatting with crew members while consuming about two glasses of whiskey and water when he thought that, with the Vessel approaching Mauritius, he might finally be able to get a smartphone signal. At around 17:50, the Master returned to the bridge with the Chief Engineer and asked Navigation Officer A_1 about the smartphone signal situation.

Although Navigation Officer A_1's smartphone could receive a signal, the Master realized that his own smartphone and that of the Chief Engineer were different from that of Navigation Officer A_1 and had contracts that did not permit use in Mauritius. The Master asked Navigation Officer A_1 to use his smartphone's tethering function[*13] to allow the smartphones of the Master and Chief Engineer to connect to wireless LAN[*14] (hereinafter referred to as "Wi-Fi"). (See Figure 2)

[*12] An Electronic Navigation Chart (ENC) is an electronic version of information that is noted on a conventional paper chart for use in an Electronic Chart Display and Information System. ENCs are published by government-authorized hydrographic organizations or under their authority.

[*13] "Tethering function" refers to a function that sets a terminal capable of connecting to the internet (e.g., smartphone connected to a mobile telephone line, etc) as an access point and then connects a device that is linked by LAN, etc., to that terminal to the internet by relaying communications.

[*14] "Wireless LAN" refers to a LAN system that sends and receives data using wireless communications.

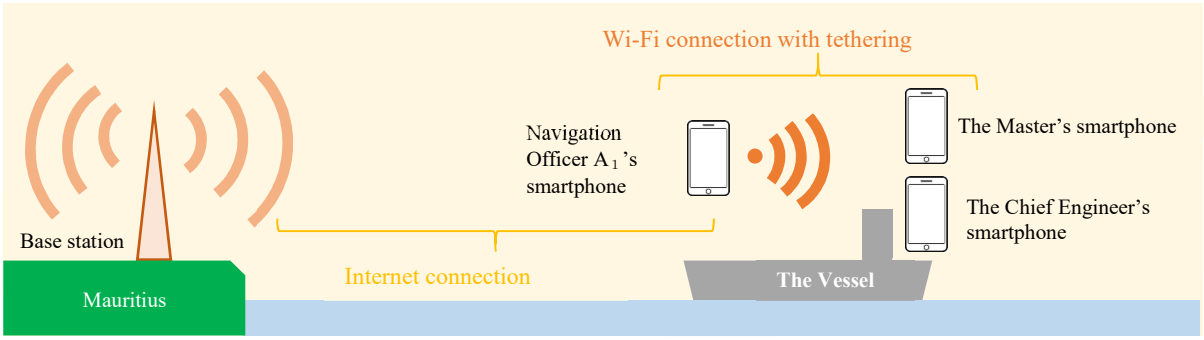


Figure 2 Internet Connection Achieved with Tethering (Conceptual Image)

Navigation Officer A_1 understood the Master's request but he could not connect the Master's and Chief Engineer's smartphones to the internet because he had used up the data communication capacity provided under his contract. He and the Master continued discussing ways of making a connection while checking the Vessel's position by ECDIS.

At around 18:30, the Master ordered the Chief Engineer to reduce the main engine's revolutions per minute from 72 to 68.

The Chief Engineer, who was on the bridge, communicated with the engine watch in the engine control room and then reduced the rpms.

At that time, Navigation Officer A_1 thought that the Master had reduced speed to extend the time for smartphone signal reception off of Mauritius as long as possible.

At around 18:35, when the Vessel was at a point approximately 11 M from Mauritius, Navigation Officer A_1 was asked by the Master how they should navigate past Mauritius's coast at a distance of 2 M from the land. Navigation Officer A_1 responded that, as there were no vessels or other obstacles in the area, they should navigate parallel with the coast.

At that time, Navigation Officer A_1 confirmed by the ECDIS that the Vessel was sailing in an area with depths of approximately 200 to 1,000 m.

Because the Master had been drinking at the birthday party, and because the Master trusted Navigator Officer A_1's ship maneuvering while on bridge duty, the Master did not personally check the course suggested by Navigation Officer A_1 and instead continued his conversation with Navigation Officer A_1 and the Chief Engineer about how to get a smartphone connection.

At around 18:45, when the Mess Man came up to the bridge to bring dinner to the Master and Chief Engineer, the Mess Man observed the Master and Chief Engineer engaged in operating their individual smartphones in an attempt to get a Wi-Fi connection with Navigation Officer A_1's smartphone.

At around 19:00, Navigation Officer A_1's smartphone lost the signal and he was using the ship's satellite telephone to inquire with an acquaintance in his home country about ways of receiving a signal when, at around 19:18, the Master pointed out that the Vessel's distance from the shore was very close at 1.5 M. Navigation Officer A_1 responded turning to port and altering course to about 227°.

(See Photo 1 and Photo 2)

Photo 1　The Vessel's Bridge (Seen from the Rear Starboard Side)

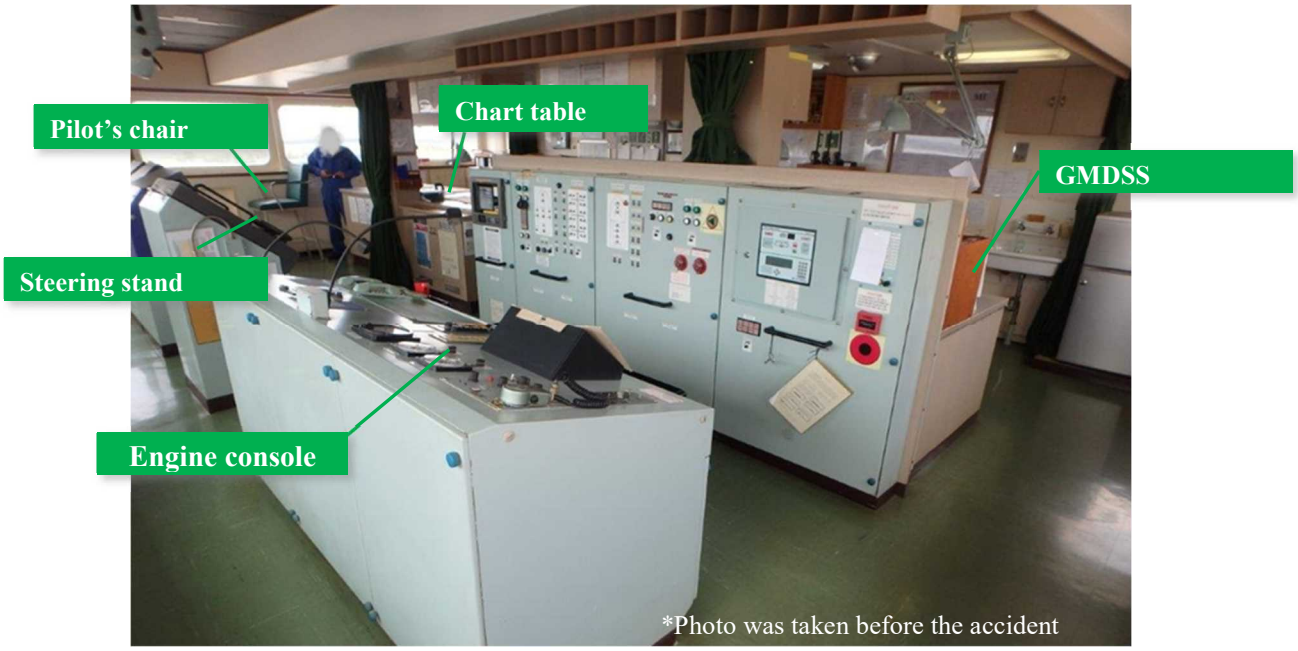


Photo 2　The Vessel's Bridge (Seen from the Forward Port Side)

(3)　Description of the Grounding

At around 19:25, the Master was continuing to chat about smartphone communication with Navigation Officer A_1 when he suddenly felt an impact with the hull and, thinking something was odd, checked the speed gauge, where he saw that the speed had fallen from approximately 11 knots (kn) to approximately 9 kn. (Speed Over the Ground)

The Chief Engineer, who was sitting in the pilot's chair on the starboard side of the bridge, felt a sudden impact and heard the Master shout that the Vessel was not moving. He therefore checked the engine console and confirmed that the main engine continued to operate and that no abnormality with the main engine's revolutions was apparent.

Because the Vessel's speed decreased further between 19:25 and 19:26, the Master thought that the Vessel's bottom had contacted with a shoal. He therefore stopped the main engine by operating

the telegraph （remote operation from the bridge） and sent the Chief Engineer to the engine room.

At around 19:26, the Second Engineer, who was on engine watch, received an order from the bridge to stop the main engine and then immediately afterward an order to set the main engine to full astern. He therefore set the engine control room's main engine control lever to full astern, whereupon he observed that the main engine's revolutions were fluctuating between 60 and 68 rpms and that the supercharger's revolutions had reached overload.

At around 19:29, the Master saw that the speed gauge read 0 kn and so decided to have all crew members assemble at their muster stations[*15] and he instructed Navigation Officer A_1 to make a ship-wide announcement to call the crew.

After Navigation Officer A_1 made the ship-wide announcement, he was ordered by the Master to check whether adjustment of ballast water drainage was possible and also to check for damage in the ballast water[*16] tanks and he therefore left the bridge and headed to the engine room.

All engineering personnel except the Chief Engineer and Second Engineer heard the ship-wide announcement and headed for their muster stations. However, because engineering personnel were subsequently instructed to go to the engine control room, all personnel returned to the engine control room at around 19:30.

The Chief Engineer ordered the engineering personnel to check all equipment in the engine room and conduct tank soundings, and around five minutes later, the Chief Engineer received reports from the engineering personnel that no abnormalities were found in any of the equipment or tanks.

At around 20:08, the Vessel was called by the National Coast Guard, Mauritius Police Force (hereinafter referred to as "Mauritius Coast Guard"), via VHF. Navigator Officer A_3 took the call and relayed it to the Master, who informed Mauritius Coast Guard that the Vessel may have grounded on shoal.

At around 20:20, the Master notified the person in charge at Company A about the Accident.

At around 20:29, an alarm indicating a leak in a fuel oil overflow tank[*17]sounded, and the Chief Engineer ordered two oilers to check on the condition of the tank. The oilers reported to the Chief Engineer that a weld suction pipe near the tank had torn loose, that a valve was broken, and that seawater was flooding into the engine room from the damaged location.

The engineering personnel suspected that the tank's plating shell had been damaged, and because repairing pipes and valves near the tank would be difficult, they worked to stop the flooding of seawater by stuffing pieces of wood into the damaged area while also pumping out the seawater in the engine room with a drainage pump. They continued this work until the morning of July 26.

(See Figure 3)

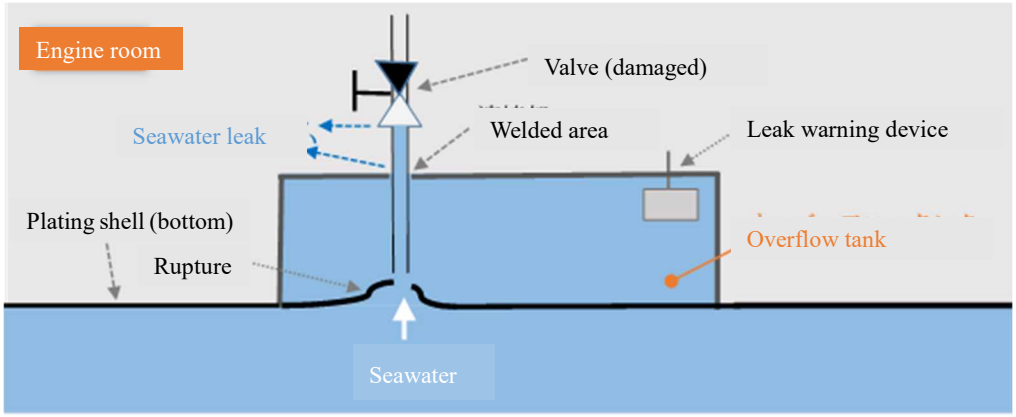


Figure 3 The Condition of the Fuel Oil Overflow Tank (Conceptual Image)

*15 A "muster station" is a specified place assigned to each crew member for assembly in an emergency, such as when abandoning ship.

*16 "Ballast water" is seawater or fresh water that is carried to maintain the ship's stability.

*17 An "overflow tank" is a tank into which excess flows when the volume of a fuel oil tank, etc., exceeds its specified level.

The date and time of occurrence of the Accident was at around 19:25 on July 25, 2020, and the location was shallows in the southeast of the Republic of Mauritius.

(See Annex Figure 1 "Estimated Navigation Route" and Annex Figure 2 "Estimated Navigation Route" (Enlarged))

2.1.4 Description of Events after Grounding

According to the statements of the Master, Navigation Officer A_1, and the Chief Engineer; information provided by the Ministry of Blue Economy; and the replies to the questionnaire of Company A, Mitsui O.S.K. Lines, Ltd., which was the charterer of Vessel A (hereinafter referred to as "Company B"), the salvage company from Japan (hereinafter referred to as "Salvage Company A"), and the salvage company from the Kingdom of the Netherlands (hereinafter referred to as "Salvage Company B"), the situation after the grounding was as follows.

(1) The Vessel did not move significantly immediately after the grounding. However, subsequently, waves and swells gradually increased due to worsening sea conditions, and the Vessel received swells from the southeast and moved in a northeasterly direction with her hull grounded.

(See Figure 4)

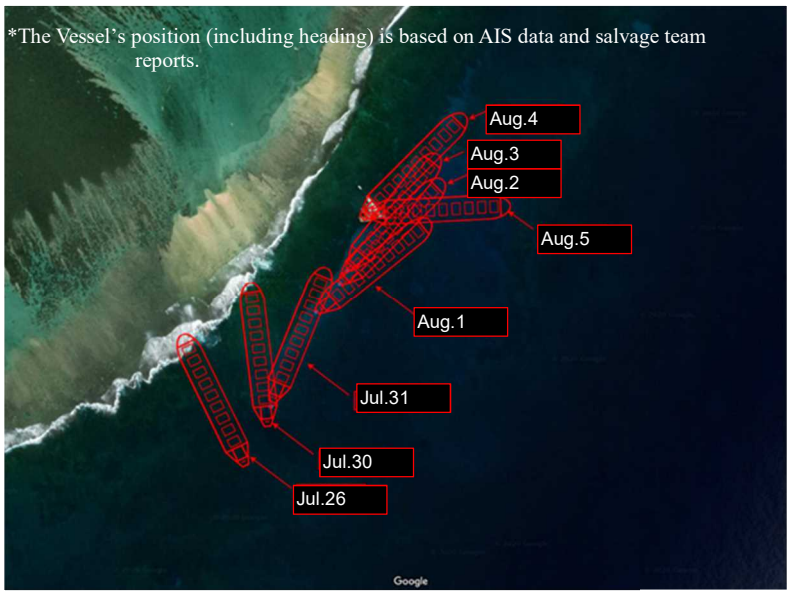


Figure 4 The Hull's Movement After Grounding

(2) Events until the release of fuel oil

When the person in charge at Company A received the first report of the Accident from the Vessel, the person instructed the Vessel to check for injuries among the crew, releases of oil, and damage to the hull as well as the conditions of ballast water and draft, etc.

Approximately two hours after receiving notification of the Accident's occurrence (around 03:20 on July 26, Japan Standard Time[*18] (hereinafter referred to as "Japan Time"), Company A assembled employees related to ship management in its head office and Company A's president set up an emergency response headquarters. Company A also sent its first report of the Accident to the person in charge at Company B.

At around 12:59 (around 17:59 Japan Time), Company A asked Salvage Company A to enter into a salvage contract with it, whereupon Company A was asked to also enter into a contract with Salvage Company B due to the remoteness of the Accident site, and therefore Company A also asked Salvage Company B to enter into a salvage contract with it.

Although the Vessel's hull did not move significantly immediately after grounding, its pitching

[*18] Japan Standard Time is a standard time that is nine hours ahead of Coordinated Universal Time (UTC).

and rolling from waves and swells gradually increased. The Vessel's stern continued to strike hard against the seafloor with such violence that some crew members in their cabins fell from their bunks while sleeping.

Salvage Company A and Salvage Company B (hereinafter referred to as the "Salvage Team") chartered one tugboat from a group company of Salvage Company B (hereinafter referred to as "Tugboat A") and began sailing it from the Port of Fujairah in the United Arab Emirates to the Republic of Mauritius at around 19:30 on July 26 (around 00:30 on July 27 Japan Time). Additionally, the Salvage Team chartered one support vessel that had been sailing near the Republic of Madagascar and began sailing it toward Réunion, territory of the French Republic, which is located to the southwest of Mauritius, at around 22:00 on the same day.

In addition to Tugboat A and the support vessel, the Salvage Team secured three tugboats (hereinafter referred to as "Tugboat B," "Tugboat C," and "Tugboat D," respectively) by July 31 and sent them to Mauritius.

(See Table 2)

Table 2　Tugboats, etc., Associated with Salvage

Classification (gross tonnage)	Date of departure (port of origin)	Date of arrival at accident location
Tugboat A (3,239 tons)	Jul. 26 (Port of Fujairah, UAE)	Aug. 6
Support vessel (3,120 tons)	Jul. 27 (Sailing near the Republic of Madagascar)	Aug. 1
Tugboat B (3,239 tons)	Jul. 27 (Port of Mumbai, Republic of India)	Aug. 1
Tugboat C (3,239 tons)	Jul. 27 (Jurong Port, Republic of Singapore)	Aug. 1
Tugboat D (289 tons)	Jul. 31 (Réunion, territory of the French Republic)	Aug. 2

The Vessel's crew members observed holes in the engine room's bilge tank[*19] and cofferdam[*20]and entering seawater on July 27 and that the forepeak bulkhead was bent on either July 28 or 29.

The support vessel arrived off the Port of Port Louis, Republic of Mauritius, on July 30, and was quarantined for the novel coronavirus infectious disease (hereinafter referred to as "COVID-19"), including PCR testing.

Early in the morning of July 31, the Vessel's heading shifted from 353° to 027° due to the effects of waves with swells and her main engine's setting loosened from the hull's striking the seafloor. On August 1, the main engine rose one or two inches （approximately 25 to 51 mm） from its seating each time the hull pitched and rolled.

On July 31, the Salvage Team injected water into the Vessel's No. 8 cargo hold for the purpose of stabilizing the hull's attitude, as weather and sea conditions were expected to worsen.

The support vessel arrived in the sea area near the Accident site and attempted to come alongside the Vessel to unload equipment and supplies for around 45 minutes beginning at 08:00 on August 1. However, the sea conditions were worsening and she was unsuccessful in coming alongside the Vessel.

Tugboat C arrived at the sea area near the Accident site after going through COVID-19 quarantine and attempted to come alongside the Vessel to take a tug line at around 23:35 on August 1 but was unsuccessful due to low visibility and worsening sea conditions. At around 06:10 on August 2, the next day, Tugboat C again attempted to come alongside the Vessel and join a tug line but was once

*19　A "bilge tank" is a tank for collecting bilgewater (a mixture of oil and water that collects at the bottom of a ship, etc.).

*20　A "cofferdam" is a space that prevents mixing into adjacent freshwater tanks, etc., when an oil tank is damaged from an impact, etc.

more unsuccessful.

At around 16:20 on August 2, ten of the Vessel's twenty crew members who were not involved in the salvage work were transported to land by four helicopters.

The Salvage Team planned to tow the hull out to sea with the support vessel and other vessels before the Vessel's damage spread to check on the hull's condition and then remove the remaining oil, including fuel oil, etc., and it proposed this work plan to the Government of Mauritius. However, the government indicated that it wanted the fuel oil removed on site first, and the team decided to follow this course of action.

At around 16:50 on August 2, the Vessel dropped her starboard anchor and let out three shackles of chain to prevent the hull's movement.

Buckling of the bulkhead and frame between the engine room, which was directly above the top of a double-bottomed tank, and No. 9 cargo hold of the Vessel was observed on August 2. The buckling was observed to be progressing at around 18:00 of the same day. At around 13:30 on August 3, seawater was observed entering the engine room from buckled locations of the No. 9 cargo hold and air vent welds of the Vessel.

At around 11:50 on August 4, the area above the Vessel's propellor shaft began to buckle and, at around 13:50 of the same day, the level of seawater flooding the engine room rose. At around 20:00 on the same day, the coolant pump for auxiliary machinery became submerged and the Vessel switched to its emergency generator.（See Photo 3）

Photo 3　The Flooded Engine Room

At around 05:40 on August 5, the emergency generator, which had been supplying power due to the radiator failure, stopped working and the onboard power supply was lost.

The Vessel's port-side stern draft was approximately 15.5 m at around 08:30 on August 5, but it subsequently increased gradually, reaching approximately 17.9 m at around 13:00 and approximately 19.4 m at around 15:45. (See Figure 5)

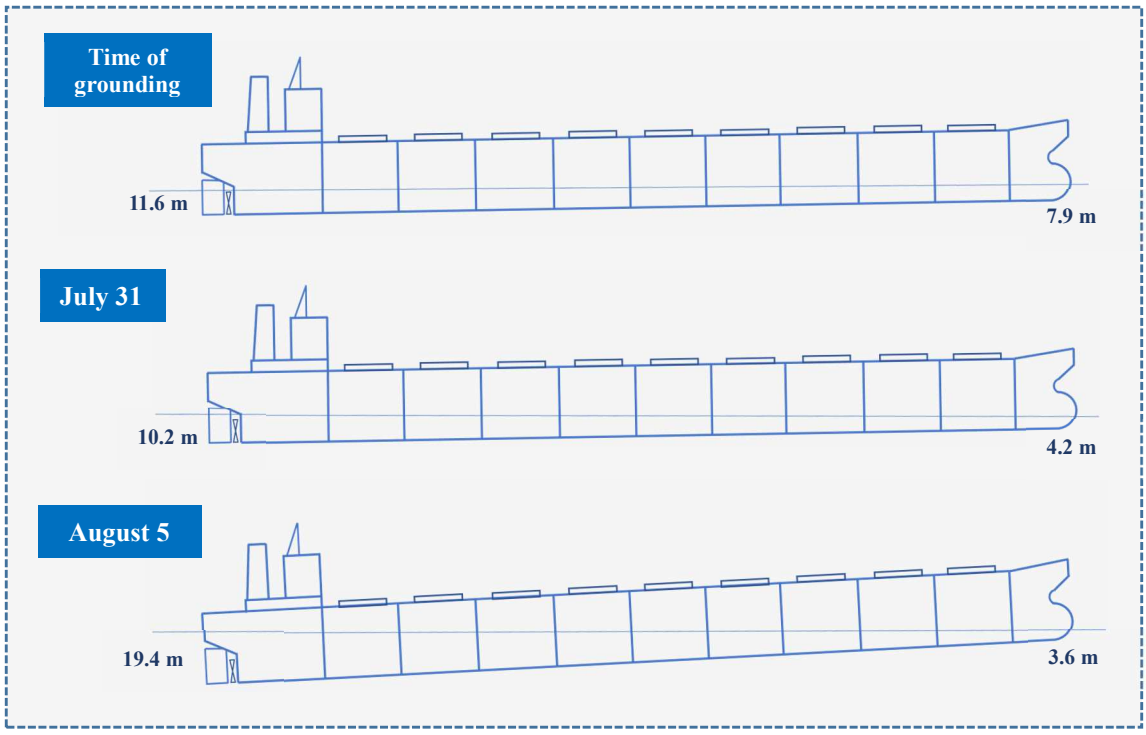


Figure 5　Changes in Draft

The Salvage Team attempted to secure an available tanker near Mauritius for the work of removing the remaining oil from the Vessel, but all tankers in the vicinity were chartered and unavailable. The team therefore planned to bring a tanker from the Republic of South Africa for this work.

At around 16:15 on August 5, the ten crew members who remained on the Vessel were transported to land by helicopter.

(3)　Events during and after the release of fuel oil

Serious buckling occurred on the Vessel's starboard side and, at around 10:30 on August 6, the No. 1 fuel oil tank (starboard) ruptured as cracks resulting from the buckling occurred and spread, and fuel oil (bunker C) leaked from the cracks onto the sea surface. (See Photo 4)

Photo 4　Fuel Oil Leaking from the Vessel's Stern

The Government of Mauritius secured a total of three oil tankers to pump out fuel oil from the Vessel and instructed the Salvage Team to contract these tankers and execute the pumping work as soon as possible.

The work of pumping out oil by the tankers had been carried out from 7 to 12 of August. By that day, a total of approximately 3,193t of fuel oil had been pumped out of the Vessel by the tankers, etc. (See Photo 5)

Photo 5　A Tanker Pumping Out Fuel Oil

Company A dispatched two employees to Mauritius to work locally on August 11.

As of August 11, the bow and stern sections of the Vessel's hull remained connected by the upper deck only; however, at around 14:00 on August 15, the bow and stern completely separated and the hull broke into two. (See Figure 6,　Photo 6 and Photo 7)

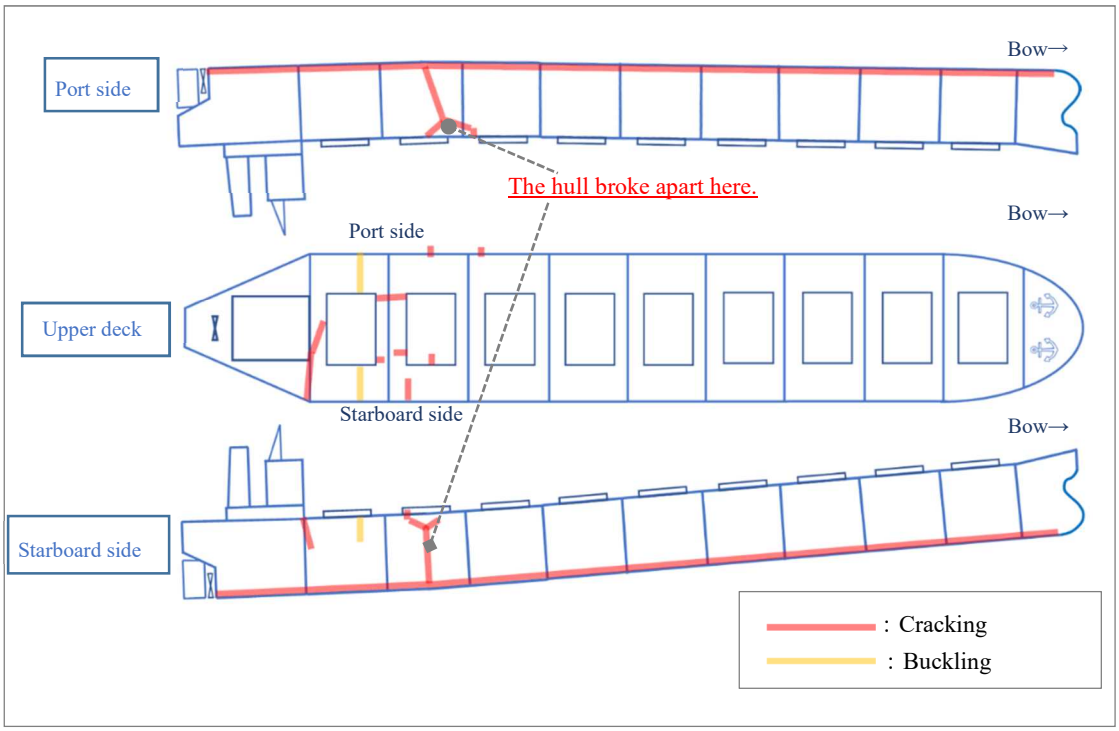


Figure 6　Cracking and Buckling Situation (as of August 11)

Photo 6　The Broken Hull

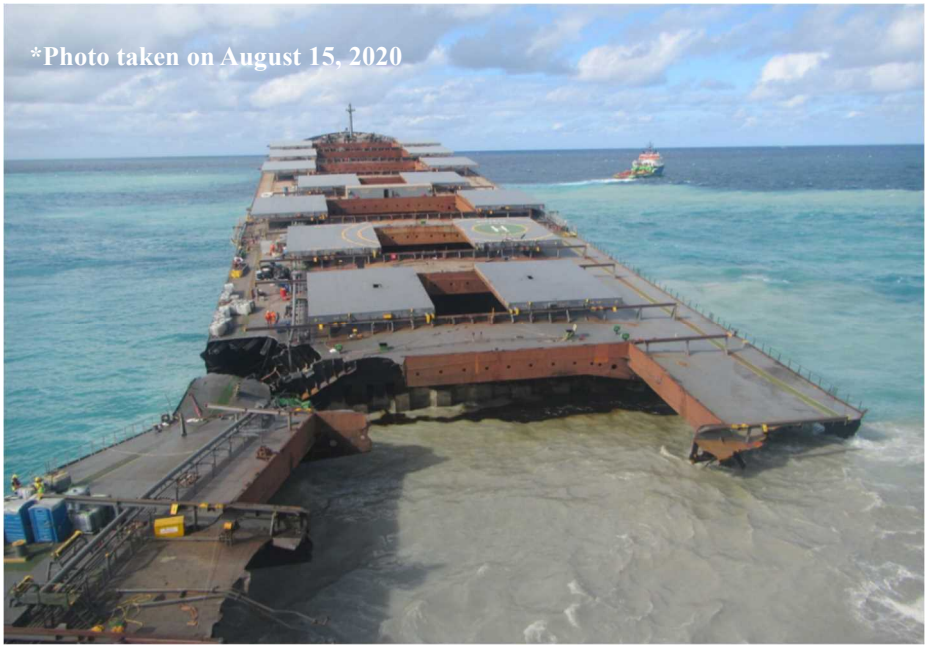


Photo 7　The Vessel's Bow Separated from the Stern

The Salvage Team received the instruction from the Government of Mauritius to dump the Vessel's bow portion at sea on August 19th. After obtaining Company A's confirmation for this, the team removed the hydraulic oil and other harmful substances from the bow portion, connected a tug line, and at around 18:00 on August 19th, began towing the portion to the dumping site using Tugboat A. (See Photo 8)

Photo 8　The Vessel's Bow Portion being Towed by Tugboat A

At around 15:00 on August 24, the Vessel's bow portion was dumped at sea at 20°23.0′S, 058°00.0′E.

After dumping the Vessel's bow portion at sea, the Salvage Team continued recovering remaining fuel oil and removed articles of the hull that would become waste from the stern portion remaining at the Accident site.

From December 11, a salvage company that was newly contracted by Company A arrived at the Accident site and began the work of maintaining the Vessel' stern portion, taking over from the Salvage Team.

The salvage company began removing the Vessel's stern portion on February 17, 2021, and completed that work on January 16, 2022. (See Photo 9)

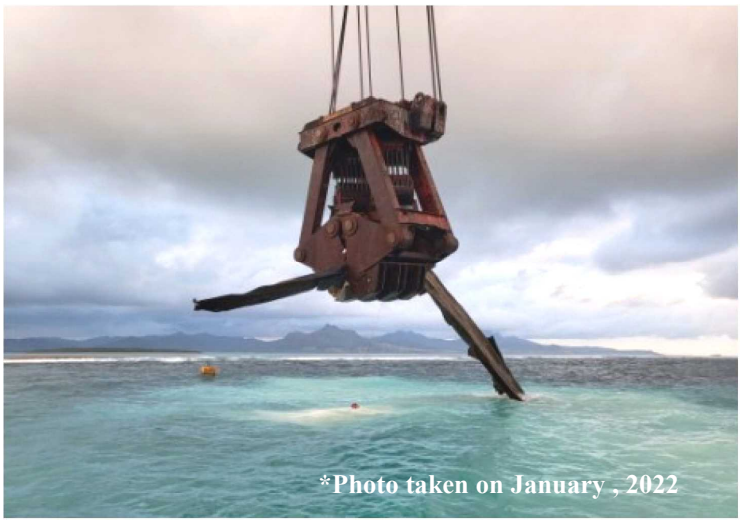


Photo 9　A Part of the Hull Being Lifted from the Seafloor

2.2　Injuries to Persons

There were no fatalities or injuries.

2.3　Damage to Vessel

After grounding, the Vessel's bulkheads buckled and sustained other damage, her hull broke in two, and she became a total loss. (See Photo 10)

Photo 10　The Broken Hull (Stern Portion)

2.4　Oil Spill

According to the replies to the questionnaire of Company A, the Ministry of Environment, Solid Waste Management and Climate Change of the Government of Mauritius and the insurance investigation company, and information on the Government of Mauritius website[*21] and the Mauritius National Assembly website,[*22] the circumstances of the fuel oil spill from the Vessel were as follows.

2.4.1　Circumstances of the Oil Spill, etc.

(1)　Amount of oil remaining in the Vessel prior to the Accident

The amount of fuel oil remaining on the Vessel, measured at 08:00 on July 25 (the day of the Accident) was as shown in Table 3. (See Figure 7)

Table 3　Amount of Oil, etc., Remaining Prior to the Accident

Tank	Amount of remaining oil	Maximum weight
No. 1 fuel oil tank (port)	1,850 t	2,525 t
No. 1 fuel oil tank (starboard)	1,191 t	1,452 t
No. 2 fuel oil tank (starboard)	805 t	992 t
Service tank	28 t	31 t
Settling tank	20 t	31 t
No. 1 diesel oil tank	104 t	164 t
No. 2 diesel oil tank	103 t	174 t
Total	Approx. 4,100 t	

*21　Government of Mauritius website (obtained on February 8, 2020) https://govmu.org/EN/Pages/default.aspx
*22　Mauritius National Assembly website (obtained on February 8, 2020)　https://mauritiusassembly.govmu.org/

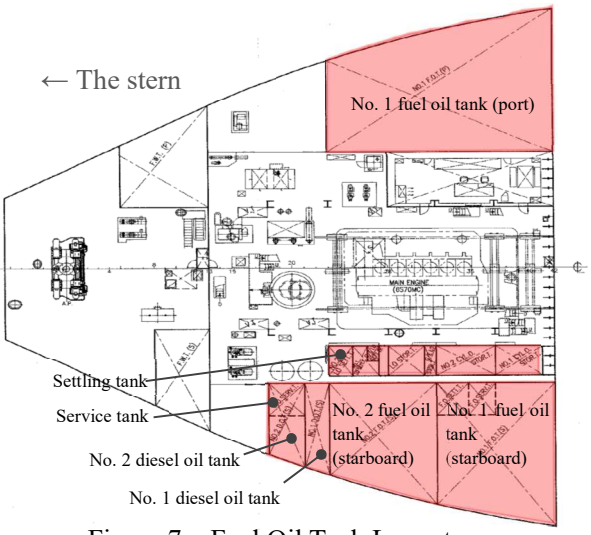


Figure 7　Fuel Oil Tank Layout

(2)　Amount of oil released onto the sea surface

Approximately 1,000 tons of fuel oil in the No. 1 fuel oil tank (starboard) spilled from a rupture that occurred in the starboard stern's plating shell. (See Photo 11)

Photo 11　Fuel Oil Spilling from the Rupture

(3)　Circumstances of the oil's spread, etc., on the sea surface

1)　Direction of spreading

The spilled oil spread from the Accident location toward the interior of Grand Port, which is an inlet to the north-northwest. (See Photo 12)

Photo 12 The Oil Spill

2) Extent of oil washing ashore

The oil spilled on the sea washed ashore along a wide section of the southeastern coast of Mauritius, from Blue Bay to Trou d'Eau Douce, covering a linear distance of approximately 25 km and a coastline length of approximately 35 km. Oil also spread into coastal inlets due to the effects of the wind and currents. (See Figure 8, Figure 11 and Photo 13)

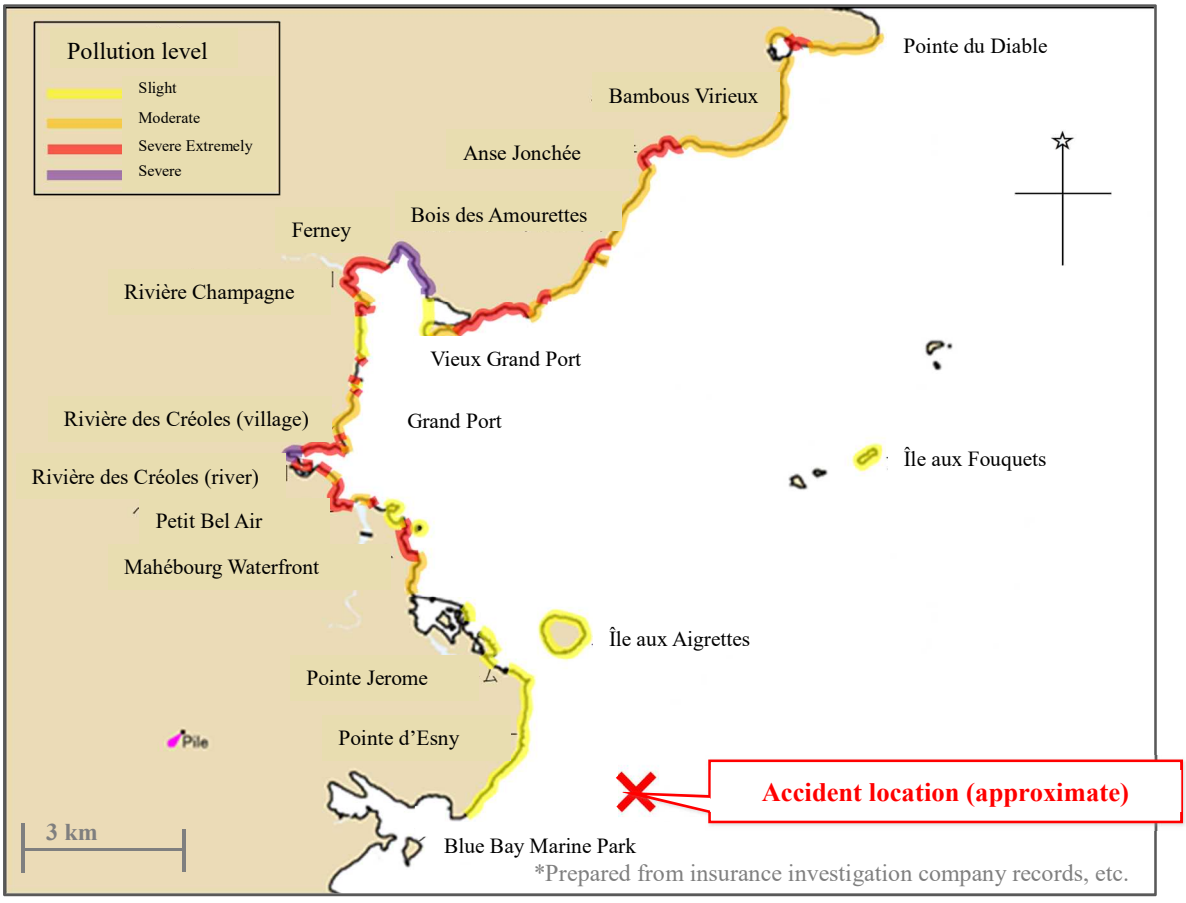


Figure 8 Extent of Spilled Oil Washing Ashore and Pollution Level

Photo 13　The Oil Spill Washed Up on the Coast

2.4.2　Description of Oil Spill Control Operations, etc.

(1)　Initial response immediately after the Accident

Immediately after the Accident, the Government of Mauritius's Special Mobile Force (hereinafter referred to as the "Special Mobile Force"), Mauritius Coast Guard, and fishermen and other local residents (about 200 people on weekdays and about 2,000 people on non-work days) carried out oil control operations that included recovering and cleaning up onshore oil. These operations were shifted to two cleaning companies that were mainly secured by the shipowner on August 19. (See Photo 14 and Photo 15)

Photo 14　Cleanup Operations on the Embarkment (Mahébourg)

Photo 15　Situation on the Coast (Mahébourg)

(2)　Period of operations

By the end of August, no more large lumps of floating oil were observed on the sea surface, and all oil fences set up near the Vessel's stern portion were removed by October 29.

The two cleaning companies conducted oil control operations from August 19 until January 9, 2021. The Government of Mauritius and an environmental research company commissioned by the Government had conducted a completion survey from January 19 to 26, and the completion of the oil control operations was confirmed on January 27, 2021.　(See Photo 16 and Photo 17)

Photo 16　A Cleanup Operations Base (Pointe Jerome)

Photo 17　A Cleaned Up Beach (Pointe d'Esny)

(3)　Personnel and Materials

Beginning on August 19, 2020, oil control operations were mainly carried out by the two cleaning companies secured by the shipowner. The operations involved a total of approximately 41,000 workers, 4,000 boats, 1,500 high-pressure cleaners, 5,000 seawater pumps, 9,000 boxes of oil-absorbing materials (oil-absorbing mats, oil snares,[*23] etc.), 4,000 flexible container bags, and 3,000 vehicles for transport and movement. (See Photo 14)

(4)　Recovery results

According to records of proceedings of the Mauritius National Assembly, approximately 1,236 tons of liquid waste fuel oil and approximately 815 tons of oil-contaminated solid waste had been recovered by August 28.

2.4.3　Response of the Government of Mauritius

According to the reply to the questionnaire of the Ministry of Environment, Solid Waste Management and Climate Change of the Government of Mauritius and information on the Government of Mauritius website and the Mauritius National Assembly website, the response of the Government of Mauritius was as follows.

(1)　National Oil Spill Contingency Plan (NOSCP)[*24]

The Government of Mauritius had established a National Oil Spill Contingency Plan (hereinafter referred to as the "NOSCP") for the purpose of ensuring that the government and operators will work together to respond quickly and effectively in the event of an oil pollution incident in the territorial waters and exclusive economic zone of the Republic of Mauritius. The NOSCP was classified into "tiers" according to the amount (scale) of oil spilled and provided an outline of envisioned responses for each tier. (See Table 4)

[*23] "Oil snare" refers to a rope-shaped oil-absorbing material.

[*24] "National Oil Spill Contingency Plan" refers to a national contingency plan for preparing for and responding to the oil spill accidents set by each signatory nation of the OPRC (see footnote [*25]) based on Article 6 of the OPRC.

Table 4　Summary of Tiered Response

Tier (Amount of oil spilled)	Outline of response
Tier 1 Up to 10 MT	Denotes a local spill, which can be effectively managed by local resources and equipment.
Tier 2 From 10 to 100 MT	Denotes a moderate spill, which can be managed by the National Oil Spill Response Team with some external help. It usually involves the deployment of personnel and equipment from within the region.
Tier 3 Above 100 MT	Denotes large spills and can involve several international organisation and worldwide call on equipment and resources to support the local and regional teams. Recovery and clean up would require sustained effort for a longer period than for Tier 2.

*MT (metric ton) = a unit of mass in the metric system　1 MT = 1,000 kg

The Government of Mauritius had deployed within its borders large oil fences, oil recovery equipment, boats, and other equipment and materials for dealing with a Tier 1 spill.

(2) Events in the post-accident response

On July 25, the Government of Mauritius convened concerned ministries and agencies in response to the Accident and initiated the NOSCP. On the following day, July 26, Mauritius Coast Guard and Special Mobile Force were mobilized with oil spill response equipment and materials to deploy oil fences around the Vessel and near the entrance to the Blue Bay Marine Park as well as to conduct surveillance and water quality monitoring around the Vessel.

After it was confirmed that fuel oil was spilling from the Vessel on August 6, the Prime Minister of Mauritius issued a Declaration of Environmental Emergency that included a statement that a Tier 3 response was required. At the same time, the Government of Mauritius requested assistance from other countries, including Japan, and international agencies and organizations in spilled oil recovery and other activities in accordance with the provisions of the OPRC,[*25] and provided information and notifications concerning the situation.

In response, personnel, equipment, and materials sent from the French Republic (navy), the Republic of India (coast guard), Japan (Japan Disaster Relief team), and other countries as well as international organizations such as the United Nations, the European Union, and the International Tanker Owners Pollution Federation Limited (ITOPF)[*26] arrived in Mauritius as needed and each began activities on site.

In addition, the Government of Mauritius set up a National Crisis Committee (NCC) with the participation of concerned ministries, agencies, experts, and others for the purpose of responding to the Accident. The NCC engaged in daily discussions of response measures for about a month beginning on August 6.

(3) Effects of COVID-19

The Government of Mauritius had been adopting quarantine measures prohibiting, in principle, entry into Mauritius from outside countries since March 19, 2020, as a border control measure against COVID-19. As a result, all scheduled international flights were suspended at the time of

*25 The OPRC (official name: International Convention on Oil Pollution Preparedness, Response and Co-Operation, 1990) is an international convention that establishes matters concerning oil pollution preparedness, response, and cooperation with recognition that a prompt and efficient response is essential for minimizing the damage that may result from an oil pollution incident.

The OPRC provides for reporting to coastal states, etc. (Article 4); reporting to the Organization (IMO) (Article 5); establishment of national systems (designation of authorities and contact points, formulation of national contingency plans for preparedness and response, stockpiling of materials and equipment, training, etc.) (Article 6); international cooperation in pollution response (sending of materials and equipment, experts, etc.) (Article 7); etc.

*26 The International Tanker Owners Pollution Federation Limited (ITOPF) is an international cooperative organization established with contributions from tanker shipowners and others to promote effective responses to spills of oil, chemicals, and other hazardous substances at sea.

ITOPF provides technical advice to government agencies and others concerned on such matters as contingency planning and on-site oil control.

the Accident, and strict quarantine measures were maintained for the entry of experts and other personnel to deal with the Accident. Such quarantine measures included limiting entry to chartered flights via Réunion and requiring 14 days of isolation at an isolation facility (hotel) designated by the government in addition to certification of negative result through PCR testing.

2.4.4 Cooperation from the Government of Japan

Upon receiving a request for assistance from the Government of Mauritius, the Government of Japan dispatched Japan Disaster Relief (JDR) teams (total of 19 members) on three occasions from August 10 to September 20, 2020. The teams engaged in activities to support oil control, provided support in the environmental field to cope with the effects of the spill, and provided oil control training and oil control-related materials to Mauritius Coast Guard and others.

The following summarizes the activities of each of the dispatched JDR teams.

	First team	Second team	Third team
Period of dispatch	Aug. 10 to Aug. 23, 2020	Aug. 19 to Sep. 20, 2020	Sep. 2 to Sep. 20, 2020
Activities	Support of oil control, etc.	Support in the environmental field to cope with the effects of the spilled oil, etc.	Technical support related to impact studies for mangroves, coral reefs, birds, water quality, bottom sediment, and fisheries; develop monitoring plan; future countermeasures, etc.
Dispatched members	Ministry of Foreign Affairs: 1 Japan Coast Guard: 4 Japan International Cooperation Agency (JICA): 1	Ministry of Foreign Affairs: 1 Ministry of the Environment: 4 JICA: 2	Ministry of Foreign Affairs: 1 Ministry of the Environment: 3 JICA: 2
Accompanying equipment and supplies	Protective gear: 10,000 sets Oil fence (20 m): 10 bags	Oil absorbent: 20 boxes	None

2.5 Crew Information

(1) Age and Certificate of Competence

1) Master: 58 years old Nationality: India
Endorsement attesting the recognition of certificate under STCW regulation I/10:[*27] the Master (issued by the Republic of Panama)
Date of issue: January 20, 2020
(Valid until September 13, 2021)

2) Navigation Officer A_1: 45 years old Nationality: Democratic Socialist Republic of Sri Lanka
Endorsement attesting the recognition of certificate under STCW regulation I/10: the Master (issued by the Republic of Panama)
Date of issue: March 1, 2018
(Valid until February 20, 2023)

3) Navigation Officer A_2: 44 years old Nationality: Republic of the Philippines
Endorsement attesting the recognition of certificate under STCW regulation I/10: the Master (issued by the Republic of Panama)
Date of issue: March 9, 2017
(Valid until October 26, 2021)

[*27] Endorsement Attesting the Issue of a Certificate Under the Provisions of the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as Amended

(2) Seagoing Experience

According to the statements of the Master, Navigation Officer A_1, Navigation Officer A_2, and the person in charge at Company A and the reply to the questionnaire of Company A, the situation was as follows.

1) The Master

The Master had served aboard ships since 1985 and has about 35 years of experience at sea. He became a master in 1996 after serving as a third officer, second officer, and chief officer.

He had 24 years of experience as a master on cargo vessels of the same type as the Vessel (six 400,000-ton class vessels and more than ten 200,000-ton class cargo vessels) and had experienced navigating in the Indian Ocean from the Strait of Malacca to the Federative Republic of Brazil on several occasions.

He came aboard the Vessel on December 2, 2019, and was originally scheduled to be on board for a period of approximately 5 months. However, the effects of COVID-19 made it difficult to arrange for replacement personnel and therefore he was remaining on board for an extended period.

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

2) Navigation Officer A_1

Navigating Officer A_1 has served aboard ships since 1996 and has about 24 years of experience at sea. He became a chief officer in 2012 after serving as a third officer and second officer.

He had served aboard about 20 vessels, all of which, except for three container vessels, were cargo vessels of the same type as the Vessel.

He came aboard the Vessel on March 1, 2020, and was serving aboard her for the second time at the time of the Accident.

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

3) Navigation Officer A_2

Navigation Officer A_2 had served aboard domestic vessels in the Republic of the Philippines from around 1994 and had experience serving as a navigation officer and master. He later began serving on ocean-going vessels and experienced serving as a third officer on three vessels and as a second officer on eight vessels.

He came aboard the Vessel on September 15, 2019, and was continuing to serve aboard her for an extended period due to COVID-19. He was scheduled to disembark at the next port of call.

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

2.6 Vessel Information

2.6.1 Particulars of Vessel

IMO NUMBER: 9337119
Port of registry: Panama (Republic of Panama)
Management company: “Company A”
Charterer: “Company B”
Owner: OKIYO MARITIME CORP. (hereinafter referred to as “Company C”)
Classification Society: NK
Gross tonnage: 101,932 tons
L×B×D: 299.95m×50.00m×24.10m
Hull material: Steel
Engine: Diesel engine × 1
Output: 16,860kW
Propulsion: 4-blade fixed pitch propeller
Date of launch: March 9, 2007
(See Photo 18)

Photo 18　The Vessel

2.6.2　Hull Structure of the Vessel

According to the general arrangement plan, the Vessel was a capesize[*28] bulk carrier with a docking bridge. She had cargo holds numbered 1 to 9 in order from the bow and 12 ballast water tanks located on both hull sides and beneath the cargo holds. In the stern were the engine room and three fuel oil tanks located on both hull sides of the engine room. (See Figure 9)

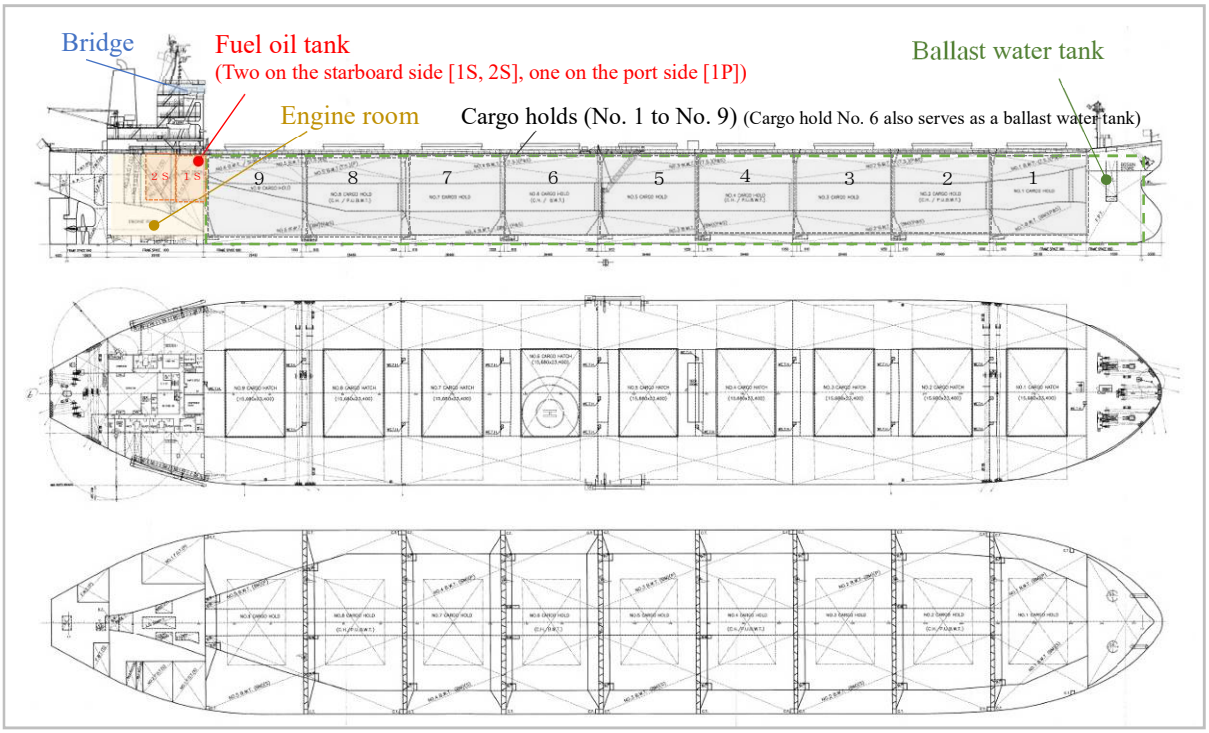


Figure 9　General Arrangement Plan

According to the reply to the questionnaire by Company A, at the time of the Accident, the vessel did not have cargo, her draft was approximately 7.91 m at the bow and 11.16 m at the stern, and there was no malfunction or failure in the hull, engine, or machineries.

*28 "Capesize" refers to a vessel that that travels between the Indian Ocean and Atlantic Ocean around the Cape of Good Hope, Republic of South Africa, and between the Atlantic Ocean and Pacific Ocean around Cape Horn, Republic of Chile, because its hull is too large to navigate through the Panama Canal and the Suez Canal.

2.6.3 Navigation Equipment, etc.

According to the wheelhouse arrangement plan, the bridge had an international VHF radio telephone system and repeater compass at the front, a steering stand in the center, two radars and ECDIS at the center starboard side, the engine console at the center port side, and equipment related to GMDSS[*29] (Global Maritime Distress and Safety System) at the rear.

According to the statement of Navigation Officer A_1, the Vessel was using the ECDIS and two radars at the time of the Accident, and that the radar ranges were set at 6 M and 3 M, respectively. (See Figure 10)

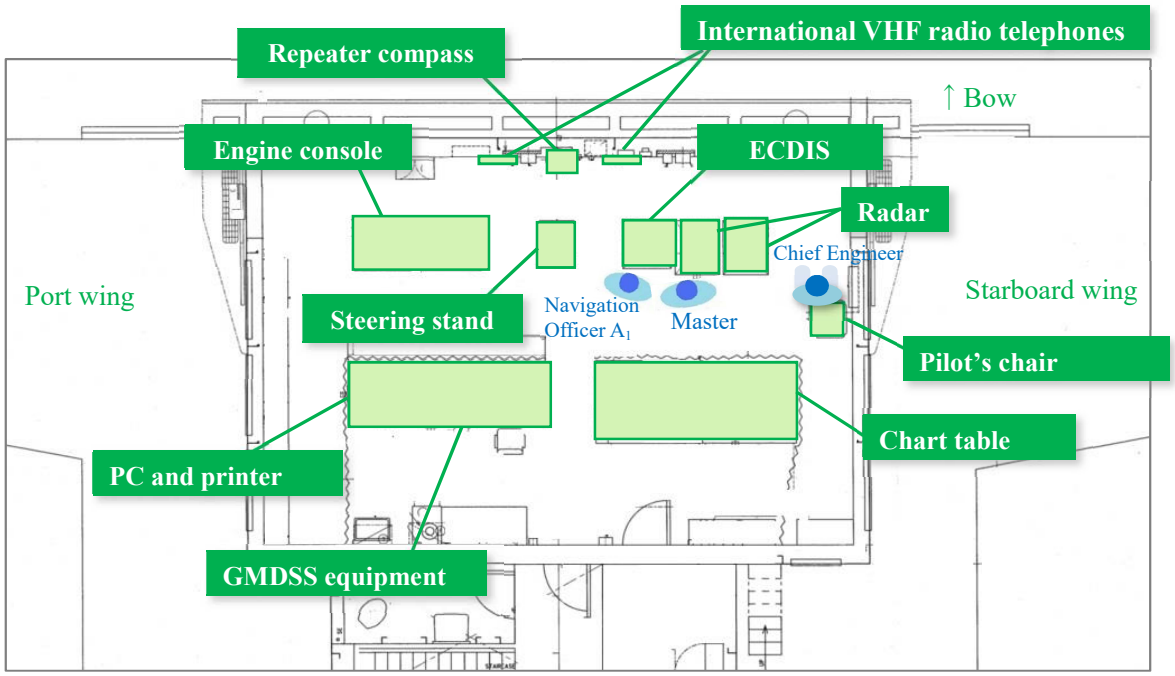


Figure 10 Bridge Layout and Crew Stations at the Time of the Accident

2.7 Information on the Sea Area of the Accident

2.7.1 Brief Description of Mauritius

According to information provided by the Ministry of Blue Economy, literature, and other sources, the situation is as follows.

(1) The Republic of Mauritius

The Republic of Mauritius is an island nation consisting of the island of Mauritius (1,865 km^2) and other islands. It has a population of 1.26 million and a land area of 2,040 km^2, (roughly the size of the Tokyo Metropolis).

(2) Mauritius

Mauritius is the main island of the Republic of Mauritius, situated in the southwestern Indian Ocean, it is a volcanic island surrounded by coral reefs.

Located in the southeast trade wind zone, the island has a tropical climate. Its southeast region tends to be wet while the northwest is dry. It has warm, wet summers from November to April and relatively cool, dry winters from June to September.

There are three environmentally protected nature reserves in the southeastern region: 1.5 M north-northwest of the Accident site is the Île Aux Aigrettes Nature Reserve, where plants and animals that are unique in the world can be found; 1.5 M west of the Accident site is the Pointe d'Esny wetland, where mangrove forests registered in the Ramsar Convention[*30] grow; and 2.0 M west of the Accident site is the Blue Bay Marine Park, a coastal wetland where endangered species live.

[*29] "Global Maritime Distress and Safety System" (GMDSS) refers to a system for making ship distress and safety communications using satellite communication and digital communication technologies.

[*30] Formal name: Convention on Wetlands of International Importance Especially as Waterfowl Habitat

2.7.2 Information Provided by Sailing Directions

The ADMIRALTY Sailing Directions: South Indian Ocean Pilot (hereinafter referred to as "the Sailing Directions"), published by the United Kingdom Hydrographic Office, contains the following description of Mauritius' south coast (provisional translation of excerpts).

(1) General information (Chart 711)

The normal course is to start from a position southwest of Pointe Sud-Ouest (20°27.89' S, 058°18.77' E) and proceed eastward about 29 M to reach a position south-southeast of Pointe d'Esny (20°25.64' S, 057°43.53' E).

(2) Topography

The area from the western end of the coast, Pointe Sud-Ouest, to the mouth of Rivière Baie du Cap (20°29.53' S, 057°22.04' E) is backed by Piton du Fouge (20°27.23' S and 057°21.57' East), situated at the end of the mountain range adjacent to the west coast. Then, for 8.5 M until the town of Souillac (20°31.18' S, 057°31.42' E), there are tree-covered hills leading to the Savanne Range.

The beach between Pointe Sud-Ouest and Souillac is largely fringed by coral reef that extends seaward about 1 M in some places.

Between Souillac and Îlot Brocus (20°28.50' S, 057°40.70' E), there are cliffs more than 30 meters high in places. The coast is interrupted by river mouths and fringed in places by steep coastal reefs. From there the coast comes down in elevation. Pointe d'Esny (20°25.64' S, 057°43.53' E) is at the eastern end of the peninsula and covered with low trees.

The depth along Mauritius southern coast is deep except for the coastal reef zone, and no dangers appear on charts beyond 1 M offshore. Flinders Bank (20°34.66' S, 057°09.53' E), at a depth of 101 meters, is the only known shoal to the south of the island. However, approaches to the island's southern and western shores have not been fully surveyed.

(3) Marine nature reserves

Blue Bay Marine Park (20°27.30' S, 57°42.75' E) encompasses the coral reef zone in the waters around Blue Bay and Îlot Des Deux Cocos.

(See Figure 11)

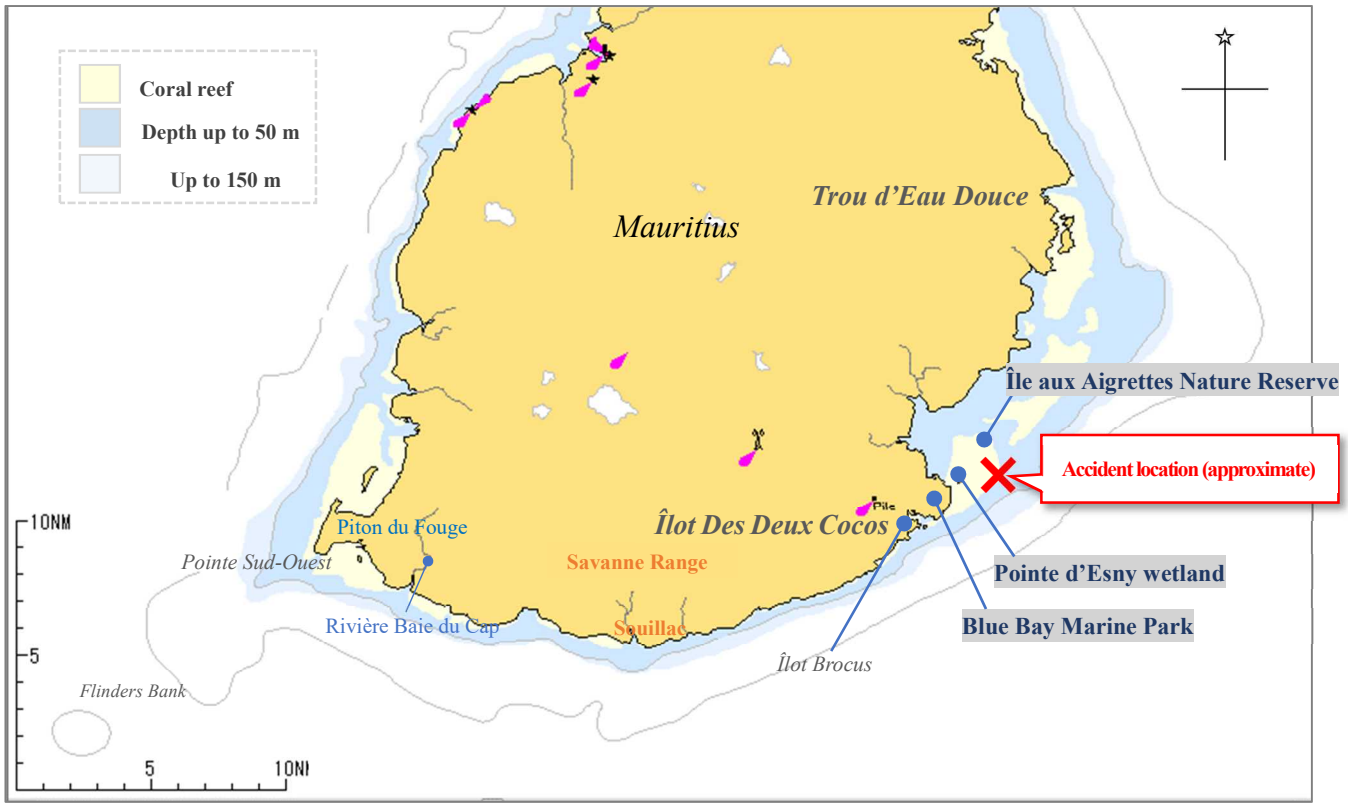


Figure 11 Southern Coast of Mauritius

2.8 Information concerning Operation

2.8.1 The Companies, etc., involved with the Vessel's Operation

According to the statements of the person in charge at Company A and the person in charge at Company B and the reply to the questionnaire of Company A, the situation was as follows.

(1) Owner and management company

The Vessel was a flag of convenience ship[*31] whose flag state was the Republic of Panama. Company C, which Company A registered as a subsidiary in the Republic of Panama, was the registered owner.

Company C had entered into an agency agreement with Company A. Company A handled maintenance, arrangement of ship supplies and other areas of ship management, crew manning and management, and crew training.

Additionally, Company C had entered into a manning agreement with Anglo-Eastern (Labuan) Limited (Malaysia; hereinafter referred to as "Company D"), a crew manning company, and entrusted that company with providing all crew members for the Vessel. However, in reality, various adjustments concerning manning were made between Company A, which was Company C's agent and, in effect, the actual owner, and Company D.

(2) Charterer

Company B leased the Vessel under a time charter contract[*32] with Company C and was using her to transport cargo.

(See Figure 12)

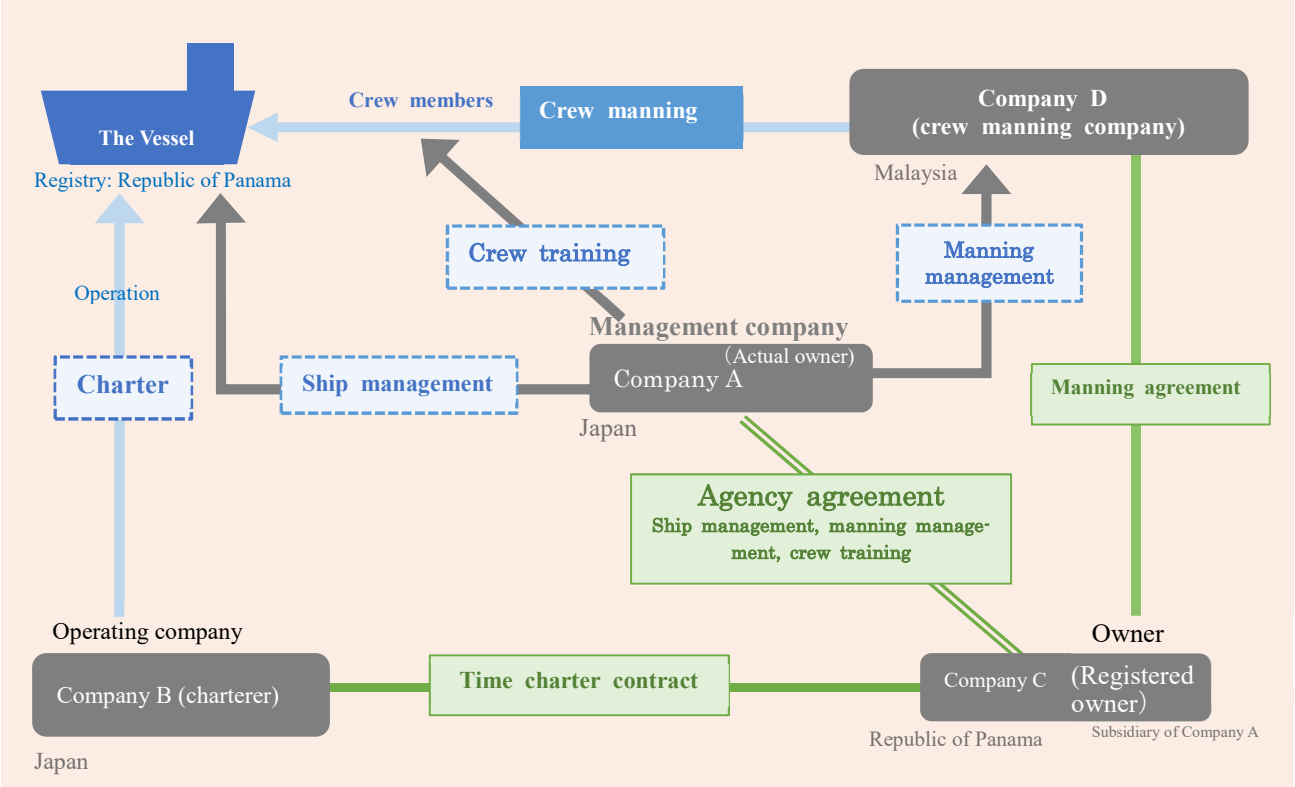


Figure 12 The Companies Involved with the Vessel's Operation

[*31] "Flag of convenience ship" (FOC) refers to a ship whose flag state registration is with a country that provides convenience in terms of crew members' nationality, taxation, etc.

[*32] "Time charter contract" refers to a contract whereby a shipowner mans a ship it owns and then leases it to a charterer for a certain period of time. The charterer pays a charterage and the owner has the responsibility of handling ship management, including manning the crew, making repairs, and procuring ship supplies.

2.8.2 Conditions of Operation

(1) Operational events prior to the Accident

According to the statements of the Master, Navigation Officer A_1, Navigation Officer A_2, and the person in charge at Company A and the reply to the questionnaire of Company A, the situation was as follows.

1) Passage plan and actual navigational events

Before the Vessel left her previous port (Port of Singapore), Navigator Officer A_2 prepared a passage plan up to the next port (Port of Tubarão) on the ECDIS and the Master approved the plan. However, because there was no requirement to submit the passage plan to either Company A or Company B, the Vessel did not submit the plan, including changes to the plan, to either company.

Figure 13 provides a comparison of the passage plan and the AIS Record showing actual navigational events (July 14 to 25).

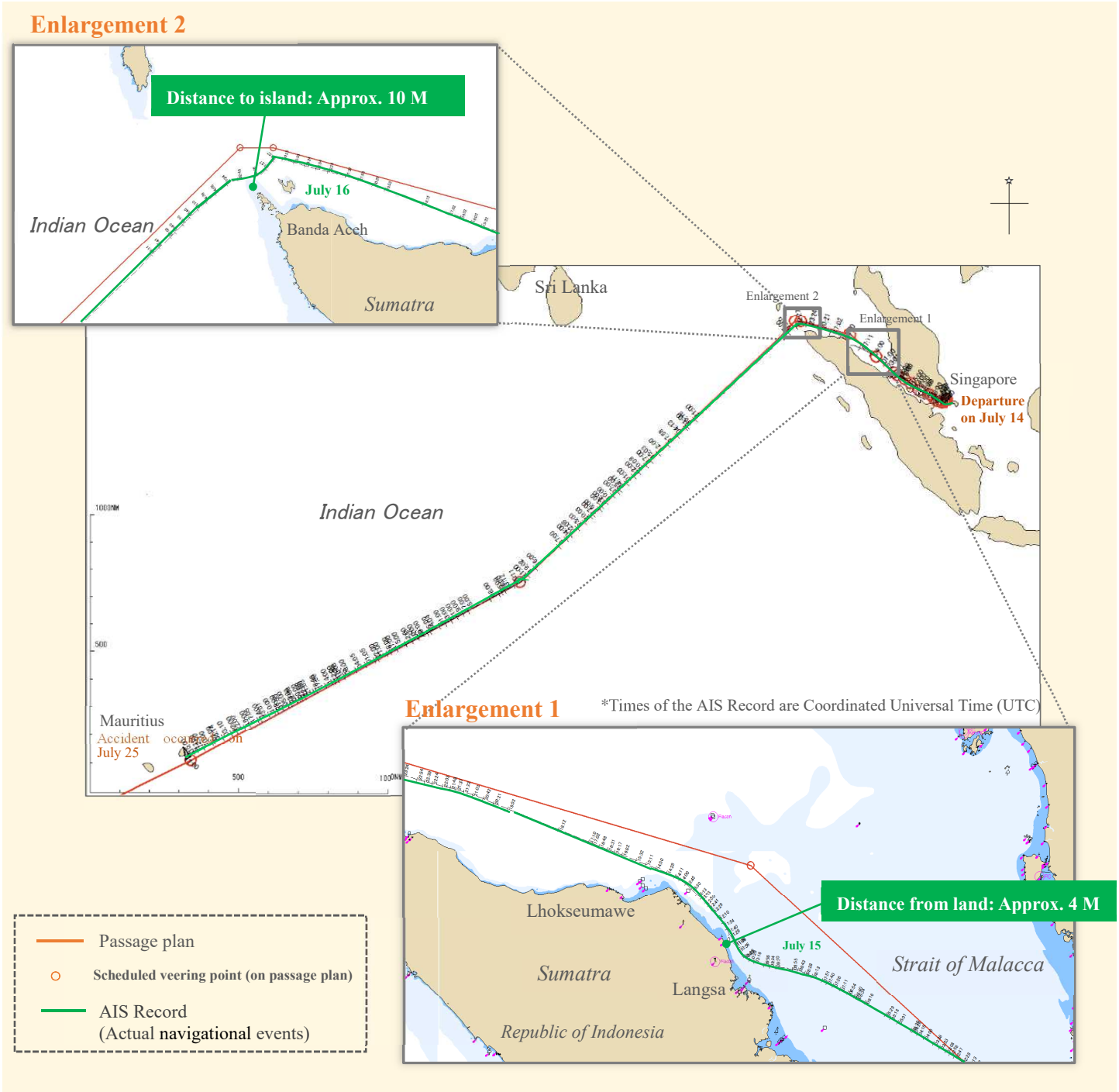


Figure 13 Passage Plan and Actual Navigational Events

After leaving the Port of Singapore, the Vessel left her passage plan's planned course and approached land, etc., on July 15 and 16 (see Enlargement 1 and Enlargement 2 of Figure 13).

According to the statements of the crew, the Vessel had left her planned course and approached land, etc., to pick up a smartphone signal at times even before the Accident.

2) Information provided in the passage pilot

Japan Coast Guard's Ocean Passage Pilot (published in March 2002) describes Indian Ocean routes as follows.

a *Westbound*

The route when sailing westward from the Strait of Malacca will follow a rhumb line route that passes north of Mauritius until it joins with the route from Colombo at a point 20 M southeast of Madagascar.

b *Eastbound*

The route from the east of Madagascar will take either of the following routes, depending on the season, after rounding the southern tip of Madagascar at a distance of more than 60 M:

・May to September: After passing 60 M southeast of Mauritius and, further, to the east of Diego Garcia, the route will head to its destination so long as there is no hindrance to navigation.

・October to March: After passing 14°S, 60°E (Q on Figure 14), the route will head for its destination as long as there is no hindrance to navigation.

(See Figure 14)

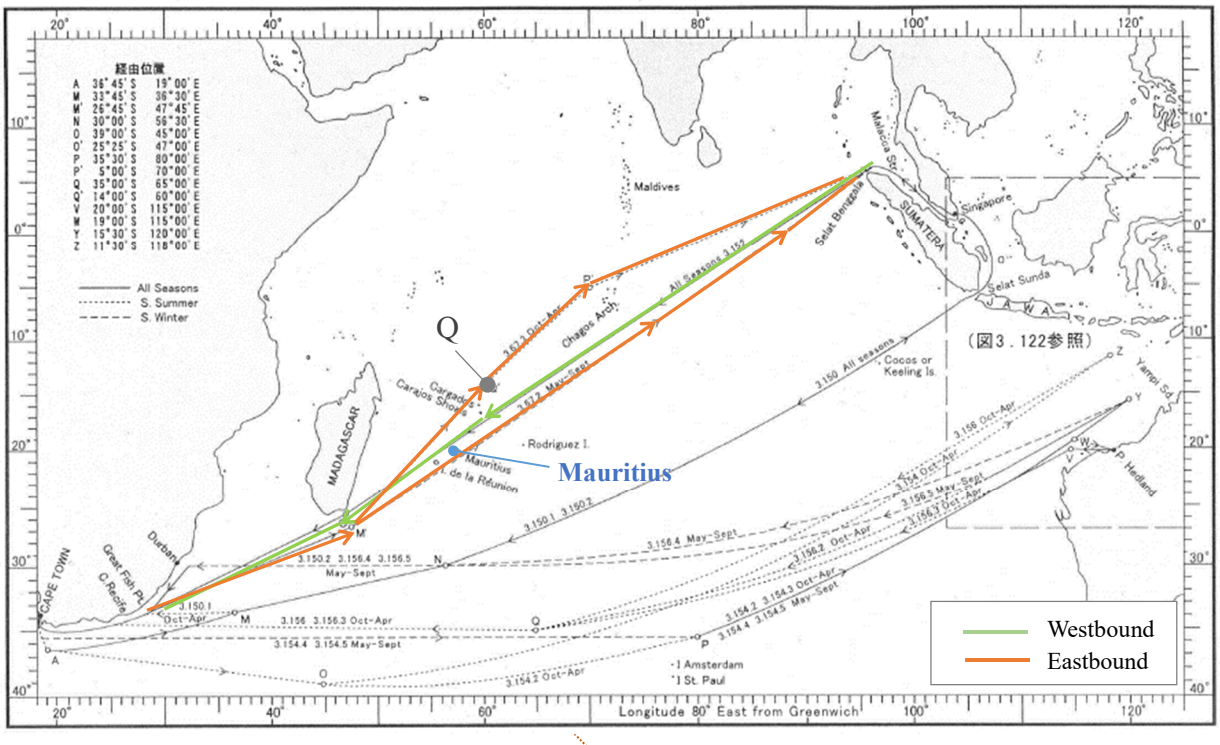


Figure 14 Main Routes Noted in the Ocean Passage Pilot (Indian Ocean)

(2) Navigational watchkeeping arrangement, etc.

According to the statements of the Master, Navigation Officer A_1, Navigation Officer A_2, and the person in charge at Company A and the reply to the questionnaire of Company A, the situation was as follows.

1) Navigational watchkeeping arrangement

The Vessel's navigational watchkeeping arrangement after departing the Port of Singapore on July 14 was as shown in Table 5.

Table 5 Navigational Watchkeeping Arrangement

Time	Bridge watch	Engine watch
08:00 – 12:00 20:00 - 00:00	Navigation Officer A_3, 1 Able Seaman	Fourth Engineer, 1 Oiler
12:00 - 16:00 00:00 - 04:00	Navigation Officer A_2, 1 Able Seaman	Third Engineer, 1 Oiler
16:00 - 20:00 04:00 - 08:00	Navigation Officer A_1, Cadet	Second Engineer, 1 Oiler

The Able Seamen and Oilers mainly handled maintenance work, etc., during the daytime (08:00 - 18:00).

The Cadet did not possess a qualification that permitted the handling of bridge watch.

2) Crew member vacancy

On May 8, 2020, as the Vessel was sailing off the coast of the Republic of Indonesia, the previous Boatswain fell overboard and went ashore and therefore one of the Able Seamen was promoted to Boatswain. However, although the Vessel had the minimum number of deck hands required by the Minimum Safe Manning Documents, there were two Able Seamen when there should normally be three, and one of the Able Seaman positions for bridge watch was vacant.

Company A had asked Company D to assign a new Able Seaman, but the assignment was not made due to the effects of COVID-19, and this vacancy situation still continued.

(3) Paper nautical charts and electronic nautical charts, etc.

1) Possession at the time of the Accident

The "paper nautical charts and ENC" (hereinafter referred to as "Charts, etc." that the Vessel was using at the time of the Accident were as shown in Table 6. The Vessel did not have Charts, etc., showing detailed depths, coastal topography, and other features for the area around Mauritius nor did she have the Sailing Directions providing information on the sea area around Mauritius. (See Photo 19)

Table 6 Charts, etc., Used by the Vessel

	Number (name)	Scale	Noted features
Paper chart	BA4702（CHAGOS ARCHIPELAGO TO MADAGASCAR）	1:3,500,000	Offshore depths, principal lighthouses, etc.
ENC	GB104702 (Chagos Arch Ile De LA Reunion)	1:3,500,000	Overview of coastlines and isobaths

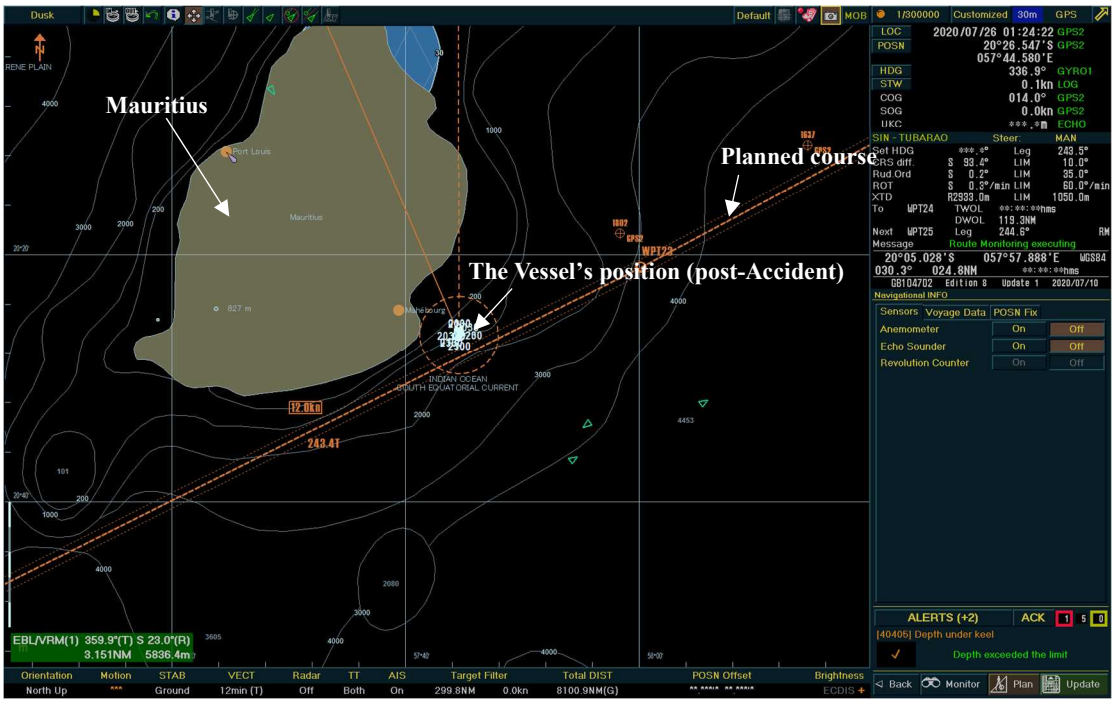


Photo 19 The Vessel's ECDIS Screen (Recorded after the Accident)

Because the Vessel was not scheduled to enter port at Mauritius, the Master thought detailed Charts, etc., for the area around the island were unnecessary.

2) Information on detailed Charts, etc.

a Paper charts

Detailed paper charts (BA3048 and BA711) of the southeastern part of Mauritius that are published by the United Kingdom Hydrographic Office contain the following information for the sea area near the Accident location.

・Discontinuity between surveys

・A coral reef is located approximately 700 meters northwest of the Accident location, and wrecks are located approximately 1,000 meters west-southwest and approximately 1,000 meters south-southeast of the Accident location.

b ENC

With the cooperation of the ECDIS's manufacturer, the ECDIS display screen at the time of the Accident was reproduced based on the charts that were possessed by the Vessel, it was found that shoreline details, shoals, and other features along Mauritius's coast were not displayed (see Figure 15(1)). In contrast, when a detailed ENC of the island's vicinity was installed, coral reefs, obstacles, and other features were displayed in the vicinity of the Accident location. (See Figure 15(2))

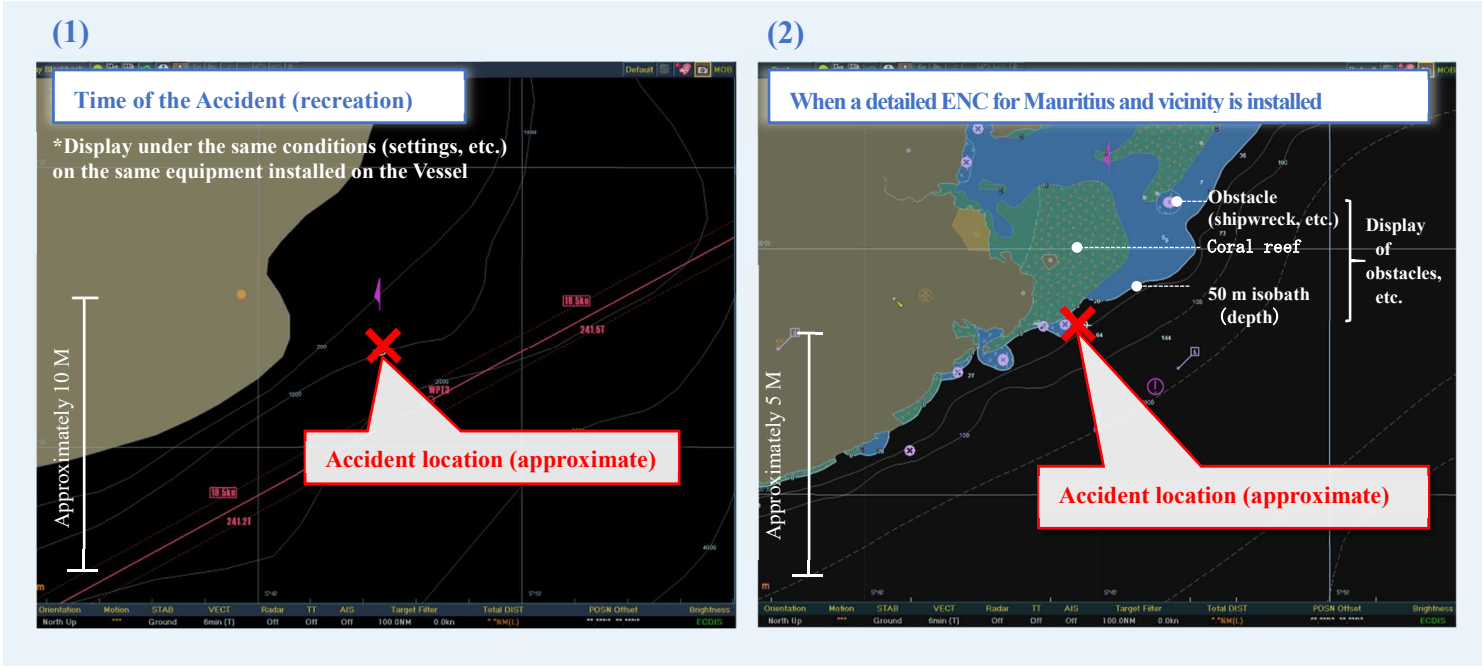


Figure 15 Recreation of ECDIS Display Conditions

3) Means of obtaining Charts, etc.

Whenever Company A received a request for new Charts, etc., from the Vessel, it promptly made arrangements for them. Company A transmitted ENC data via satellite communication equipment even while the Vessel was underway at sea, and sent paper charts and sailing directions to the Vessel's next port of destination.

(4) Precautions concerning ECDIS displays

The following information concerning chart (ENC) scale is provided in the ECDIS training textbook.[*33]

1 8. 4 Misinterpretation due to scale

ECDIS can be scaled up or down to effectively obtain information on water depth, obstructions, and other features necessary for safe navigation. However, the following points must be borne in mind when changing the scale.

(1) If the display is excessively enlarged (overscale), chart and user information can become scattered and targets frequently used to approximate distances may be lost. Additionally, if the scale exceeds twice the original scale, a vertical line will appear on the chart display area and a warning will be displayed.

(2) If the display is excessively scaled down, some information may become obscured.

(3) Omitted

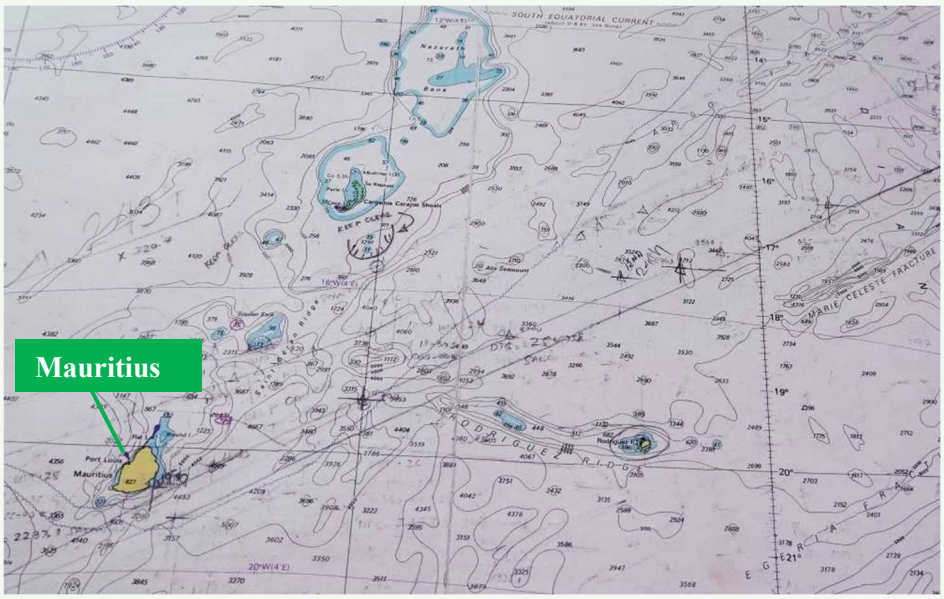
To avoid the above problems, it is important to select and use charts of appropriate scale.

(5) Ship's position fixing

The bridge watchkeepers checked the Vessel's position on the ECDIS and recorded it (numerical values indicating latitude, longitude, etc.) in the log each hour. Additionally, the Vessel's position was noted on the paper chart used at the time of the Accident at three locations for July 25.

(See Photo 20)

[*33] "ECDIS Kunren Tekisuto" ECDIS Kyoiku Kenkyukai (ed.), Kaibundo (published in April 2020)



Enlargement

Area around Mauritius

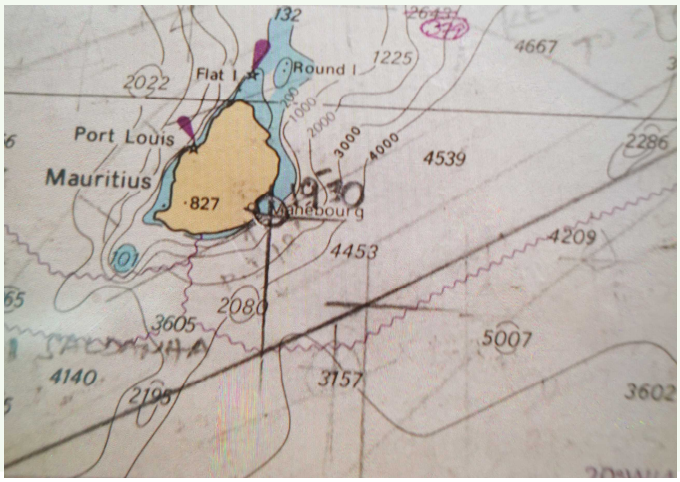


Photo 20 Paper Chart Used at the Time of the Accident

(6) Logbook entries

The entry space in the Vessel's logbook (16:00 to 20:00, July 25) contained the following entries.

1600: Nav Watch taken over from 2/Off. Compasses compared.
Courses checked. Vessel on auto pilot. Hand strg tried out.
VHF watch on ch-16. GMDSS watch maintained. Vessel position plotted regularly on ECDIS and paper charts. Set allowed as required.
V/L experiencing rolling and pitching slightly to moderately/heavily at times.
1925: Vessel had grounded at position 20° 26.6′S, 057° 44.6′E, off Mauritius Island.
Announcement made crew to muster at muster station.
2000: Reported Incident to Mauritius Coast Guard.
2000: Watch handed over to 3rd Officer. C/O

2.9 Information on Safety Management

2.9.1 Safety Management System

According to the statement of the person in charge at Company A and the reply to the questionnaire of Company A, the situation was as follows.

(1) Safety management system manual

Company A formulates a Safety Management System (hereinafter referred to as "SMS") to ensure the safe operation of its vessels in conformity with the International Safety Management Code, which is based on Chapter IX of SOLAS, and prepares a manual concerning that system (hereinafter referred to as "the SMS Manual"). Company A furnished the SMS Manual to the Vessel.

(2) Regulations in the SMS Manual

The bridge watch procedure and passage plan preparation procedure are prescribed as follows in the watch/supervision procedure manual and passage plan procedure manual, respectively, of Company A's SMS Manual.

① Bridge watch procedure (excerpt)

1 Watchkeeping on Navigation Bridge
Appropriate lookout *Keeping the following methods in mind, always keep an appropriate lookout according to the situation, and accurately assess the surrounding situation, the danger of collision with other vessels, and the risk of running aground, etc.* *(1) By visual observation using the naked eye or binoculars* *(2) By radar and ARPA* *(3) By ECDIS* *(4) By ear (whistles, distress signals, VHF, etc.)* *(5) By all other means appropriate to the situation* *Keeping lookout by using only one of the above methods is hazardous. A systematic watch must be kept by combining several methods.*
Duties while on watch *(1)(2)* Omitted *(3) Periodically check the vessel's position and speed. (As a rule, every 30 minutes during ocean navigation, every 15 minutes during coastal navigation, and every 5 minutes when navigating in a narrow channel)* *(4) Take depth measurements in shallow waters.*
2 Handling of equipment
ＥＣＤＩＳ *Like paper charts, ECDIS ENC is an indispensable tool for the safe operation of ships. Use it properly in accordance with the Equipment Operation Procedures, instruction manuals, etc. Rectify any shortages or deficiencies in charts or software.*
3 Coastal navigation
Engage in coastal navigation in waters where the vessel's position can be determined visually, by radar, and by ECDIS. The officer of the watch must ensure safe navigation by observing the following. *Items to be checked during coastal navigation:* *a) That the charts and bibliographies used are up to date* *b) That the set course line is safe (Are information on sunken reefs and shoals and charted course markings correct?)* *c) The relationship between the vessel's draft and water depth* *d) Tides and currents in the waters being navigated* *e) f)* Omitted *g) Ship squatting in shallow waters* *h) Local information issued by coastal states, etc.*
4 Positioning interval
During normal coastal navigation, find the vessel's position every 15 minutes and enter it on the chart. When sunken reefs, shoals, or other dangers to navigation may exist, and when entering/leaving port, at

anchor, etc., verify safety by continually conducting positioning to the extent that it is feasible.

5 Bridge personnel stationing

The master shall be responsible for deciding whether to increase the number of watch personnel on the bridge depending on the sea conditions and alert level for the safe operation of the vessel.

6 Watch level

The various levels for bridge watch personnel are classified as follows according to the surrounding sea conditions and the alert level workload:

(1) Level A: One watch officer on duty on the bridge (permitted only during daylight hours when visibility and navigational safety are sufficiently ensured); quartermaster may stand by

(2) Level B: One watch officer and one other watchkeeper; quartermaster may stand by

(3) Level C: Two watch officers (one watch officer and the master or an navigation officer) and one other watchkeeper; quartermaster may stand by

(4) Level D: Two watch officers (one watch officer and the master/navigation officer or one pilot), one quartermaster, and one other watchkeeper

(5) Level E: Three watch officers (one watch officer may be the master and one may be a pilot), one quartermaster, and one other watchkeeper

No.	*Type of Passage*	*Bridge Watch Level*
1	*Daytime ocean navigation when visibility and navigational safety are sufficiently ensured*	*Level A*
2	*Ocean navigation other than the above*	*Level B*
3	*Coastal navigation with sufficient visibility and safety*	*Level B*
4	*Coastal navigation not in congested waters but with limited visibility*	*Level C*
5	*Coastal voyages in congested waters with limited visibility*	*Level D*
6	*Navigation in waters in or near a port*	*Level D*
7	*Navigation in waters requiring that a pilot be on board, in highly hazardous waters (narrow channels, waters with numerous reefs, etc.), or in sea conditions providing a narrow field of vision*	*Level E*

② Passage plan preparation procedure (excerpt)

1 Responsibility for passage plan preparation

The master is responsible for planning and preparing the passage plan but may delegate some of the planning and preparation to the second officer.

The passage plan planning and preparation duties that may be designated to the second officer shall be as follows:

a) Preparation of charts (paper charts and ECDIS ENC), hydrographic publications, and other publications necessary for the voyage

b) Calculation of the navigation distances necessary for the voyage, and preparation of a distance table and passage plan chart

c) Entering course lines on the charts to be used

d) Entering on charts necessary information, such as navigation warnings and channel information in the waters to be navigated

e) Other preparations or work as directed by the master

2 Passage plan preparation

Outline of passage plan preparation

(1) Use accurately revised and up-to-date charts (paper charts and ECDIS ENC) and hydrographic publications. Keep appropriate charts on hand for emergency entries.

(2) Ascertain weather and sea conditions.

(3) (4) Omitted

(5) Determine the special characteristics of the waters to be navigated and their effect on the vessel's maneuvering performance.

(6) Consider the effects of heel, trim, specific gravity of sea water, and ship squatting during navigation on

keel clearance.

(7) (8) (9) Omitted

(10) Even if you have taken the same route on the vessel in the past, do not rely on that alone but instead work to improve the route for more economic operation (to the extent that it does not impair the vessel's safe operation) based on personal experience.

(11) When navigating by islands and reefs, maintain a minimum distance of two miles as a general rule, even if the islands, etc., are clearly shown on radar or easily visible. If radar detection and visual observation are difficult and no prominent targets are present, stay at least 5 miles from shore as a general rule.

(12) Prepare the passage plan chart.

(13) Omitted

(SMS Manual content is taken verbatim from the original)

(3) Education system

Company A provides education on the SMS Manual and other aspects of the Safety Management System to crew members who newly come aboard its managed vessels as follows.

Employment

(Company D) Send letter of recommendation containing background, etc., to Company A.
(Company A) Determine crew members with consideration for seagoing experience, background, and condition of health.

⇩

Pre-boarding education

Persons in charge at Company D who have been educated by Company A provide education. (Company A does not provide education directly.)
(Place)
Company D offices in crew members' home countries (India, Sri Lanka, the Philippines).
(Content)
Education covers particulars of vessels, muster lists, scope of duties and division of responsibilities, the ISM Code, and Company A's SMS Manual.
(Time)
・Masters, Chief Officers, and Chief Engineers: 8 hours
・Other crew members: 4 hours

⇩

Onboard education

(Company A) Visit ships in Japanese ports and send safety-related information by email.
(Masters) Masters provide SMS Manual education together with safety and health education once a month.

(4) Routine report (Noon Report)

Company A received a Noon Report by email once a day from the Vessel that contained information on noon position, average speed, ETA to next port, amount of remaining oil, and weather and sea conditions.

2.9.2 Crew Members' Awareness

The results of a survey to determine awareness by the Master and three navigation officers (total of four people) aboard the Vessel with respect to intervals in measurement of ship position and other matters noted in the SMS Manual are provided in Table 7.

Table 7　Survey of Awareness by the Master, etc.

Item	Content provided in the SMS Manual	Persons with proper awareness
Position fixing interval	As a rule, to be done every 30 minutes during ocean navigation and every 15 minutes during coastal navigation	2 persons
Bridge personnel stationing and navigational watch level	Level B (1 watch officer and one other watchkeeper; quartermaster may stand by) (at time of Accident)	1 person
Distance from shore	As a rule, stay at least 2 M from shore even when the shore is clearly shown on radar, etc. As a rule, stay at least 5 M from shore when radar detection, etc., is difficult and no prominent targets are present.	None

2.9.3 Company B's Participation in Safety Management

According to the statement of the person in charge at Company B and the reply to the questionnaire of Company B, the situation was as follows.

(1) Company B was the charterer and therefore not directly involved in the Vessel's safety management. However, as the operating company, Company B provided information on weather conditions and other safety-related matters for sea areas of navigation to the Vessel and conducted a ship inspection[*34] once a year.

The most recent ship inspection was conducted in June 2019.

(2) Company B was monitoring all of the vessels it operates, including chartered vessels, 24 hours a day at its Safety Operation Supporting Center, and transmitting information for avoiding rough weather and other items concerning navigational safety to them as appropriate. However, it was difficult for the system to detect intentional actions by crew members, such as approaching a shoreline, as in the case of the Accident.

2.10　Information on the Consumption of Alcohol

2.10.1　Contents of the SMS Manual

The SMS Manual's Crew Management Procedures establish alcohol regulation and management procedures as follows.

３．Regulations on alcohol

The consumption of alcoholic beverages on board should not exceed an amount that would be detrimental to health and safety in the long term. In addition, crew members should adhere to the principle that being in a state of incapacitation when performing scheduled duties is unacceptable, and they should avoid consuming alcohol before their scheduled watch or work hours. Furthermore, they must not forget that everyone must be able to respond to an emergency situation at any time. Based on the following, Table 3-(a), (b), and (c) below establish units for amounts of alcohol consumed and set periods of time during which alcohol should be prohibited in accordance with the instructions of (1) and (2) below. The master of the vessel shall immediately stop any crew member suspected of consuming alcohol from performing his or her ship's duties. However, if the vessel is in U.S. waters, the provisions of U.S. Coast Guard (USCG) Regulations shall apply.

(1) The consumption of alcohol is prohibited for four hours before beginning watch.

(2) A person will be considered to be intoxicated if a test shows that his or her blood alcohol content is 0.04% or more by weight.

Table 3-(a)　Units (hours) for Amounts of Alcohol Consumed

Type	*Alcohol content*	*Amount*	*Unit (hours)*
Beer, cider, lager			

[*34] "Ship inspection" refers to the act of actually visiting a ship and checking its condition in order to determine its condition and the status of its safety management system.

Particularly strong *Ordinary strength* *Weak*	*＞4.0%　＜6.0%* *＞1.0%　＜4.0%* *＞0.05%　＜1.0%*	*300 ml* *300 ml* *300 ml*	*2.5* *1.0* *0.5*
Wine, etc.	*＞6.0%　＜12%*	*100 ml* *1 liter bottle*	*1.0* *10.0*
Sherry, fortified wine, etc.	*＞12%　＜16%*	*60ml* *1 liter bottle*	*1.0* *16.0*
Spirits, liqueurs, liquors, etc.	*＞16%　＜40%*	*30 ml*	*1.0*
Low-alcohol beverages	*＞0.05%　＜1.0%*	*300 ml*	*0.5*
In the above table, one unit shall be defined as one hour during which no alcohol is consumed. A period of no alcohol consumption to be determined based on the number of units must be observed prior to the start of scheduled work hours.			

Table 3-(b)　Breath Alcohol Concentration and Blood Alcohol Concentration Conversion Table

Body alcohol content			
Breath		*Blood*	
mg/l	*ppm*	*mg/100 ml*	*BAC%**
0.05	*26*	*10*	*0.01*
0.10	*52*	*20*	*0.02*
0.20	*104*	*40*	*0.04*
0.25	*130*	*50*	*0.05*
0.30	*156*	*60*	*0.06*
0.40	*208*	*80*	*0.08*
0.50	*260*	*100*	*0.10*
0.60	*312*	*120*	*0.12*
0.70	*364*	*140*	*0.14*
0.80	*416*	*160*	*0.16*
0.90	*468*	*180*	*0.18*
1.00	*520*	*200*	*0.20*

(＊BAC: Blood Alcohol Content)

Table 3- (c)　Amount of Alcohol Consumed and Blood Alcohol Concentration

Amount			*(BAC %)*	*(mg/l)*
Glass of wine	*Large bottle of beer (700 ml)*	*Single shot of whiskey*		
1.5 - 3	*0.5 - 1*	*1 - 2*	*0.02 - 0.04*	*0.1 - 0.2*
3 - 6	*1 - 2*	*2 - 5*	*0.05 - 0.10*	*0.25 - 0.5*
6 - 9	*3*	*6 - 7*	*0.11 - 0.15*	*0.55 - 0.75*
15 - 20	*5 - 7*	*10 - 15*	*0.16 or more*	*0.8*

a) The consumption of two units of alcohol per hour would result in a blood alcohol concentration of 0.04%.

b) On average, alcohol metabolizes at a rate of one unit per hour.

2.10.2　Alcohol Consumption by the Master, etc.

(1)　The Master's Situation

According to the statement of the Master, the situation was as follows.

At around 17:00 on July 25, the Master left the bridge to join a birthday party, where he consumed about two glasses of whiskey and water. He subsequently returned to the bridge at about

17:50.

After the Master returned to the bridge, his understanding was that, because he had consumed alcohol, the Chief Officer would handle all aspects of ensuring navigational safety, including checking position and setting course.

(2) The Effects of the Consumed Alcohol

The effects of alcohol consumption are described in literature[*35] as follows.

Alcohol has an inhibitory effect on the central nervous system. As blood alcohol concentration increases, that effect becomes stronger and causes various changes in the body and mind. Alcohol's metabolism is also affected by individual differences in body constitution, the circumstances of alcohol consumption (intake of other food and drink), and day-to-day changes in physical condition. Consequently, factors other than blood alcohol concentration must be taken into consideration when making a determination.

Drunkenness, the amount of alcohol consumed, blood alcohol concentration, and general intoxication are described in literature[*36] as follows.

D*runkenness is a symptom of acute intoxication caused by the ingestion of alcohol that affects the central nervous system. Such intoxication leads to ataxia (such as staggering and slurring), autonomic symptoms (such as facial flushing and sweating), and the generalized deterioration of central nervous system functions (such as impaired attention and judgment). As the concentration of alcohol in the blood increases, a strong disturbance in consciousness occurs.* (The rest is omitted.)

The following table shows amounts of alcohol consumed, blood alcohol concentrations, and states of general intoxication.

Stage (Blood alcohol concentration %)	Amount consumed (Japanese sake)	State of intoxication
Euphoria (0.02 – 0.05)	Up to 1 *go* (180 ml)	Feeling of invigoration, reddening skin, cheerfulness, slightly dulled judgment
Slight intoxication (0.05 – 0.10)	1 or 2 *go*	Slight tipsiness, active hand movements,without inhibition, elevated body temperature/rapid heartbeat
Early drunkenness (0.10 – 0.15)	3 *go*	Generosity, quickness to anger, louder voice, wobbliness when standing
Drunkenness (0.15 – 0.30)	5 *go*	Staggering, rapid breathing, repetition when speaking, nausea/vomiting
Stupor (0.30 – 0.40)	7 *go* to 1 *sho* (1.8 liters)	Inability to stand properly, confusion, incoherent speech
Coma (0.40 – 0.50)	1 *sho* or more	Unresponsiveness even when shaken, incontinence (urination and bowels), deep and slow breathing, death

(*The above table was prepared based on Japanese characteristics)

2.11 Weather and Sea Conditions, etc.

According to information of the Government of Mauritius' Ministry of Blue Economy, the reply to the questionnaire of Company A, and the statements of two crew members, the situation was as follows.

2.11.1 Weather and Sea Conditions

(1) July 25 (the day of the Accident)

	Mauritius Meteorological Services	Observations by Crew Members
Weather	Cloudy with occasional rain	Cloudy (good visibility)

*35 "Alcohol Tests and Pharmacokinetics" (Journal of Clinical Laboratory Medicine 56(13), Izumi Takase and Tatsuya Fujimiya, 2012)

*36 "*Arukoru to Kenko*," Munehiro Hirayama, Hiromasa Ishii, and Masahiro Takaishi (supervision); Health and Medicine of Alcohol Association (April 2015)

Wind direction and speed	SE, 7 m/s	SSE, 5 m/s
Temperature	20°C (average temperature)	—
Wave height	4.1 m (maximum wave height)	2 to 3 m
Visibility	—	Good

According to the statements of Navigation Officer A_1 and Navigation Officer A_2, on the day of the Accident (July 25), the Vessel was driven approximately 5° starboard due to the effects of wind and swells from the port side.

(2) July 28 and after (observations by the Salvage Team)

	Weather	Wind direction	Wind force	Waves	Swells (wave direction)
Jul. 28	Cloudy	SE	4	1.0 m	2 to 3 m (unknown)
Jul. 30	Cloudy	E	3	0.5 to 1.0 m	2 to 3 m (SE)
Aug. 1	Cloudy	SE	4 to 5	1.5 m	2 m (SE)
Aug. 3	Cloudy	SE	5 to 6	3.0 to 3.5 m	5 m (SE)
Aug. 5	Cloudy	SE	4 to 5	3.0 to 4.0 m	5 m (SE)
Aug. 7	Cloudy	SE	5	2.5 to 3.0 m	5 m (SE)
Aug. 9	Clear	SSE	3	3.0 m	3 m (SSE)
Aug. 11	Clear	ESE	2 to 3	2.0 m	2 m (SSE)
Aug. 13	Clear	ESE	2	2.0 m	2 m (SSE)
Aug. 15	Clear	SSE	4	2.0 to 3.0 m	2.5 m (SSE)

2.11.2 Tides, etc.

(1) Tides

According to information of the Mauritius Meteorological Services (Government of Mauritius), the tide at Mauritius at the time of the Accident was in the mid-stage of an ebb tide and the height of tide was approximately 42 cm.

(2) Time of Sunset

Sunset in the vicinity of the Accident location on July 25 was 17:50.

2.12 Information on Ship-to-Shore Communication

2.12.1 Communication Equipment

The Vessel was equipped with a ship's satellite telephone capable of communication anywhere in the world except the polar regions (communication service name: Inmarsat Fleet Broadband) as her means of communication during ocean navigation. Crew members could purchase prepaid cards through Company A and use the telephone for voice calls and email, even for personal business.

The Vessel was not equipped with communication equipment capable of high-speed data transmission with a fixed fee system. (See Table 8)

Table 8 Comparison of Satellite Communication Environments at Sea

Communication service name	Inmarsat Fleet Broadband **(Onboard the Vessel)**	VSAT	Inmarsat Global Xpress
Max. transmission speed	432 Kbps	2 Mbps	8 Mbps
Method of fee charging	Pay per use	Fixed fee	Fixed fee

Reference: Transmission speeds of mobile telephones/smartphones
1G speed: Analog line
2G speed: 2.4 Kbps to 19.8 Kbps
3G speed: 384 Kbps
4G speed: 300 Mbps to 500 Mbps
5G speed: 1 Gbps to 10 Gbps

2.12.2 Use of Communication Equipment by Crew Members and Actual Means of Communication

According to the statements of the crew members, the ship's satellite telephone was infrequently used by crew members because its fees were expensive and it could not transmit data. Crew members used their own smartphones to communicate at each port of call or coastal country they passed during the voyage, switching to SIM cards of the corresponding telecommunication provider for each region.

2.12.3 Mobile Phone Service Area of Mauritius

According to a telecommunications service area map provided on the website of the GSM Association (an industrial association of mobile network operators and related companies that use the GSM mobile phone system),[*37] the sea area of Mauritius having telecommunications coverage as about 10 km (about 5.4 M) from the coast. (See Figure 16)

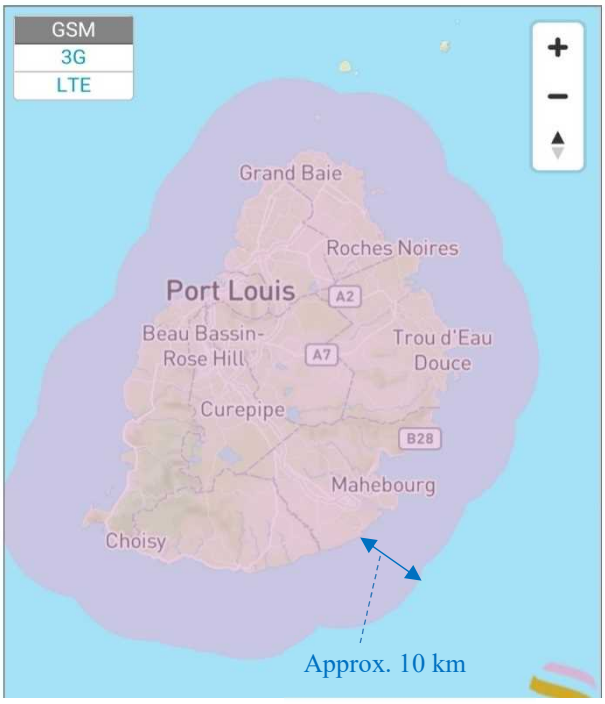


Figure 16 Coverage Area of Mauritius' Mobile Phone Service

2.13 Information concerning the Development of Systems for Preventing Grounding Accidents, etc.

According to the reply to the questionnaire by "a private-sector software developer and a private-sector weather information provider," after the Accident, both companies independently developed systems providing advance notification of the danger of grounding accidents, etc., and began providing a service to

[*37] The GSM Association's website: https://www.gsma.com/coverage/#79

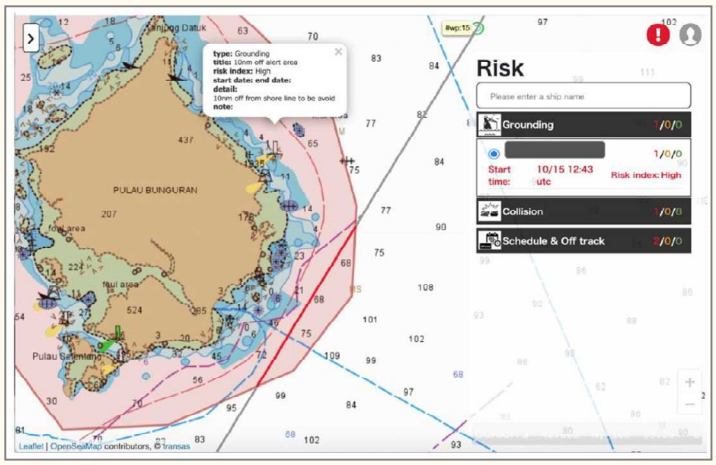
facilitate coordination for safe operation between vessels (operators) and management companies.

The service automatically analyzes a vessel's AIS record, nautical charts and other sea area data, and past vessel movement data, and when it detects the following predefined navigational conditions, it sends an alert to the vessel and related companies at set time intervals.

- When the vessel sets a course to a highly hazardous sea area, such as a shoal, or approaches such an area during navigation (judged from the vessel's draft, sea area information, etc.)
- When the vessel deviates from a general route (judged from ship type, gross tonnage, etc.)
- When the vessel approaches a prohibited area (judged from sea area information, etc.)

(See Photo 21)

(Provided by the private-sector software developer)



(Provided by the private-sector weather information provider)

Photo 21 Systems for Preventing Grounding Accidents, etc. (Sample Screens)

3 ANALYSIS

3.1 Situation of the Accident Occurrence

3.1.1 Course of the Events

According to 2.1, 2.8.2, and 2.11.1, the JTSB concludes that the course of the events leading to the Accident were as follows.

(1) Changes of course, etc.

1) At around 09:00 on July 14, 2020 (Singapore time), the Vessel departed from her anchorage in the Port of Singapore, Republic of Singapore, for the Port of Tubarão, Federative Republic of Brazil, with the Master and 19 other crew members aboard.

2) At around 22:00 on July 20 (UTC), the Vessel changed course to starboard at a veering point in the central Indian Ocean (the intersection of 10° S and 078° E), which was her scheduled veering point, and sailed on a heading of 241°.

3) At around 07:00 on July 22 (UTC), the Vessel changed course to port and sailed on a heading between 237° and 251° until 13:15 on July 25, except when she made temporary course changes to avoid other vessels, etc.

During this time, from around 08:00 on July 22 to around 11:00 on July 24 (UTC), the Vessel's heading was deflected about 5° to port relative to the Vessel's course over the ground, and it is probable that the Vessel was being driven to the northwest due to the influence of tidal currents, etc. Additionally, from around 11:00 on July 24 (UTC), the Vessel's heading was deflected about 4° to starboard relative to the Vessel's course over the ground, and it is probable

that the Vessel was being driven to the southeast due to the influence of tidal currents, etc. From the above, it is probable that the Vessel had set her heading with consideration for the driving current and was navigating by generally maintaining a course of 241° (course over the ground).

4) At around 13:15 on July 25 (Mauritius time; hereinafter the same), the Vessel changed her heading of 241° but was sailing on a course over the ground of approximately 245°, and it is therefore probable that she was being driven approximately 4° to the northwest.

The Vessel changed her heading from 241° to 234° between around 17:47 and 17:58, and continued on the same heading until around 19:18; however, her course over the ground was 238°. The Vessel subsequently changed her heading to 227° at around 19:19.

Each of these changes were made by auto pilot.

5) It is probable that the Vessel's heading made a large change to starboard at around 19:25 due to the impact, etc., at the time of grounding.

(2) Changes of speed

1) From around 13:15 to 18:22 on July 25, the Vessel sailed at a speed of between 11.0 kn and 12.0 kn.

2) At around 18:22 on July 25, the Vessel's main engine revolutions decreased and, from around 18:25, her speed decreased from approximately 12 kn to approximately 11 kn.

3) It is certain that the Vessel's speed decreased to 9.4 kn at around 19:25 and further to 1.7 kn at around 19:27 due to the impact, etc., at the time of grounding.

3.1.2 Date, Time and Location of the Accident's Occurrence

According to 2.1.1 to 2.1.3 and 3.1.1, the JTSB concludes that it is highly probable that the situation was as follows.

(1) The Accident occurred at around 19:25 on July 25, 2020, when the Vessel's speed decreased rapidly in the Vessel's AIS Record and VDR Record.

(2) The Accident occurred at 20°26.5′S, 057°44.7′E (shallows on Mauritius's southeastern side), which is the position indicated in the Vessel's AIS Record at around 19:25.

3.1.3 Damage to the Hull

According to 2.1.4 to 2.3, the JTSB concludes that it is certain the situation was as follows.

(1) After grounding on July 25, the Vessel became inoperable and, subsequently, seawater began flooding into the engine room and the hull began striking against the seafloor due to the effects of the waves, etc. Consequently, the Vessel's bulkheads buckled and other damage was sustained by around August 2, her hull broke in two on August 15, and she became a total loss.

(2) After her hull broke in two, the Vessel was dismantled and removed by salvage companies. Her bow portion was dumped at sea after toxic substances were removed on August 24.

Work to remove the Vessel's stern portion started on February 17, 2021, and was completed on January 16, 2022.

3.1.4 Circumstances of the Oil Spill onto the Sea Surface

As described in 2.4.1, the approximately 1,000 tons of fuel oil that spilled from the Vessel ono the sea surface spread out on the sea drifted ashore along a wide section of the southeastern coast of Mauritius, from Blue Bay to Trou d'Eau Douce, covering a linear distance of approximately 25 km and a coastline length of approximately 35 km.

3.2 Causal Factors of the Accident

3.2.1 Crew Members

As described in 2.5, the Master and Navigation Officer A_1 each possessed legal and valid maritime qualifications, had no problems with their vision or hearing, etc., and were in good health. The JTSB concludes that these situations did not play a role in the occurrence of the Accident.

3.2.2 Condition of the Vessel

As described in 2.1.3 and 2.6.2, there was no malfunction or failure with the Vessel's hull, engine, or

machineries at the time of the Accident, and therefore the JTSB concludes that their condition did not play a role in the occurrence of the Accident.

3.2.3 Analysis of Weather and Sea Conditions

According to 2.1.3, 2.1.4 and 2.11, the JTSB concludes that it is probable that the weather and sea conditions were as follows.

(1) At the time of the Accident, the wind was SSE at approximately 5 m/s and there were swells of 2 to 3 meters, but these did not interfere with navigation and did not lead to the grounding.

(2) After the Accident, the Vessel moved toward the northeast as her hull was repeatedly subjected to violent pitching and rolling while still grounded on the shallows. It is probable that this movement was because the Vessel received swells from the southeast as sea conditions worsened.

3.2.4 Analysis of Navigational Conditions, etc.

According to 2.1, 2.8.2, and 3.1.1, the JTSB concludes that the Vessel's navigational conditions, etc., were as follows.

(1) Navigational conditions

1) After departing the Port of Singapore on July 14, the Vessel continued to navigate according to the passage plan prepared by Navigation Officer A_2 after passing the northwestern end of Sumatra, with the exception of some sailing on July 15 and 16. However, while proceeding southwest in the Indian Ocean on July 23, the Master issued an order to make the distance to the coast of Mauritius, which was to be approximately 22 M on the original passage plan, approximately 5 M in order to receive a smartphone signal, and Navigation Officer A_2 changed the passage plan to have a course toward that point.

2) At around 13:15 on July 25, the Master ordered a course change from 239° to 241° to bring the Vessel even closer to Mauritius, and Navigation Officer A_2 changed to that course.

3) At around 17:00 on July 25, the Master instructed Navigation Officer A_1 to change to course 240° where the scheduled course of 241° intersected with line of longitude 058° E, and, at around 17:48, when the Vessel reached the point instructed by the Master, Navigation Officer A_1 changed course to 234° after considering the wind and currents.

At around 18:30, the Vessel was driven approximately 4° to the northwest by the effects of a wind, etc., from the southeast and was on a course over the ground of 238°.

4) Between around 17:50 and around 19:25, the Master and Navigation A_1 directed their attention to ways of connecting to a smartphone signal, etc.

At around 18:30, the Master ordered a reduction in speed from approximately 11.8 kn to approximately 10.6 kn. It is possible that this instruction was in order to extend the time for receiving a smartphone signal.

5) At around 18:40, Navigation Officer A_1 was asked by the Master about the plan for passing the coast of Mauritius. Navigation Officer A_1 checked the depth by ECDIS and responded that he would navigate parallel with the coast at a distance of 2 M. However, the Master had been consuming alcohol and, additionally, he trusted Navigation Officer A_1 with matters concerning ship maneuvering while on bridge watch, and therefore it is probable that the Master did not verify the safety of the course Navigation Officer A_1 provided in his response.

6) As the Vessel continued to approach the coast for the purpose of receiving a smartphone signal, the Master became uneasy about the depth in the area of navigation and the possibility of grounding at around 19:17, and at around 19:18 he noticed that the distance from the shore had become 1.5 M and pointed out to Navigation Officer A_1 that the coast was very close. It is probable that Navigation Officer A_1 responded by changing course to 227° at around 19:20.

7) At around 19:25, an impact against the hull was felt and the Vessel's speed fell suddenly from approximately 10.2 kn. At that moment the Master was continuing to chat with Navigation Officer A_1 about the smartphone signal.

(2) Circumstances of the approach to Mauritius

It is highly probable that the Vessel's distance from the coast of Mauritius at specific time points on July 25 was as shown in the following table.

Time	18:30	18:45	19:00	19:10	19:15	19:22	19:25
Distance from the coast of Mauritius (M)	5.0	3.5	2.0	1.3	1.5	1.2	1.1

*"Mauritius" includes the surrounding island group.

3.2.5 Analysis of the Watchkeeping Arrangements

According to 2.1.3, 2.5 (2), 2.8.2, and 2.9, the JTSB concludes that the situation was as follows.

(1) Stationing of bridge watch personnel

From the time that the Vessel departed from the Port of Singapore on July 14, the two people of the Navigation Officer A_1 and the Cadet had the bridge watch from 04:00 to 8:00 and from 16:00 to 20:00. The Cadet, who was not qualified to conduct bridge watch, was tasked with conducting lookout, etc., while on watch.

Because a birthday party for a crew member was planned to start from around 17:00 on the day of the Accident, Navigation Officer A_1 told the Cadet, with the Master's permission, not come to the bridge from 18:00 and he handled lookout, checking of position, steering, and other bridge watch duties alone.

According to the bridge watch procedure in Company A's SMS Manual, the watch level is classified according to sea conditions and sailing (navigational) conditions, and at the time of this Accident, the navigational conditions were such that stationing in accordance with least Level B (one watch officer and one other watchkeeper) or higher was required. However, as is stated above, no watchkeeper other than Navigational Officer A_1 had been stationed, and therefore it is certain that bridge watch was not being conducted with the appropriate personnel prescribed in the SMS Manual.

(2) Measurement of ship position

According to the passage plan preparation procedure in the SMS Manual, the Vessel was navigating at a point less than approximately 2 M from the shore at the time of the Accident, and therefore measurements of ship position every 15 minutes, which are required during coastal navigation, were necessary. However, navigation officers had recorded position on the chart at only three locations during the bridge watches of July 25, the day of the Accident, and therefore it is probable that measurements of ship position were not being made on the Vessel at the intervals prescribed in the procedure.

3.2.6 Analysis of Navigational Preparations

According to 2.1.3, 2.7, 2.8.2 (3) to (6), and 2.9.1, the JTSB concludes that the situation was as follows.

(1) Preparation of Charts, etc.

The SMS Manual's passage plan preparation procedure prescribed that accurately revised and up-to-date charts and hydrographic publications are to be used and that appropriate charts are to be kept on hand for emergencies. However, at the time of the Accident, the Vessel did not have Charts, etc., noting detailed depths, etc., near Mauritius, nor did she have the Sailing Directions noting information on Mauritius's coastal topography and other features. Consequently, at the time of the Accident, the Master and Navigation Officer A_1 were checking the Vessel's position and other navigational conditions on the ECDIS, whose display was zoomed to "overscale."

The Master changed the passage plan by ordering a change in the distance to the coast of Mauritius from approximately 22 M to approximately 5 M on July 23 and an even closer approach to the island on July 25. However, because the Vessel was not scheduled to enter port at Mauritius, it is probable that the Master thought that detailed Charts, etc., for the island were unnecessary and therefore he did not obtain them.

Detailed Charts, etc., for the area around Mauritius noted that the waters near the Accident location had depths of 20 meters or less and that wrecks and other obstacles existed nearby. Therefore, it is probable that had the Vessel obtained detailed Charts, etc., for the area around Mauritius, the Master and Navigation Officer A_1 would have known about the depths, obstacles, and other features and would have been aware of the risk of grounding beforehand.

(2) The passage plan

Because the Vessel was approaching to within 1.5 M of Mauritius's coast at the time of the Accident, it is probable that the Master and Navigation Officer A_1 did not properly understand the distance from coast regulations noted in the passage plan preparation procedure (maintain a minimum distance of 2 M as a general rule even if features are clearly shown on radar; as a rule, stay at least 5 M from shore when radar detection, etc., is difficult and no prominent targets are present).

There was no obligation to submit the passage plan including changes to the plan to either Company A or Company B, and the two companies did not have a firm grasp of the Vessel's passage. Accordingly, it is probable that neither company had a system that could immediately recognize and issue an alert concerning the Vessel's behavior even in cases in which she changed her passage plan, left her planned course, and approached land, etc., as in 3.2.4 above.

3.2.7 Analysis of Safety Management

According to 2.8, 2.9, 3.2.5 and 3.2.6, the JTSB concludes that it is probable the situation was as follows.

(1) Company A provided pre-boarding training for newly boarding crew members at Company D's offices in the crew members' respective countries of origin, and personnel of Company D who had received training from Company A educated the crew members on the contents of the SMS Manual as well as the particulars of vessels and other items.

Additionally, although Company A sent safety information to the Vessel by email and visited her when she called ports in Japan, it left day-to-day training on the SMS Manual to onboard training provided by the Master.

On the other hand, Company B, in its capacity as the charterer, was not directly involved in safety management, which includes the selection of master and other crew members and the contents of the Vessel's SMS manual, nor did it have a system for sharing information with Company A.

(2) As was described in 2.9.2, 3.2.5, and 3.2.6(2) above, the crew members of the Vessel did not have a correct awareness of the provisions of the SMS Manual concerning matters necessary to ensure safe navigation, such as distance from shore, etc. Company A must have crew members who are newly boarding its managed vessels correctly understand the contents of SMS Manual before boarding and continuously provide education on the manual after their boarding.

On the other hand, Company B must ensure the safe navigation of the vessels it charters by being actively involved in the safety measures that Company A implements.

3.2.8 Analysis of Ship-to-Shore Communications and Crew Members' Awareness with Respect to Safe Navigation

According to 2.1.3, 2.8.2, 2.12, and 3.2.4, the JTSB concludes that the situation was as follows.

(1) As described in 3.2.4(1) above, it is probable that the Master ordered a change to a course approaching Mauritius for the purpose of receiving a smartphone signal. In addition, it is probable that the Vessel has on previous occasions left her planned course at the direction of the Master and approached land, etc., up to a distance where a smartphone signal was receivable for the purpose of receiving such a signal.

Although the Vessel's crew members could use the ship's satellite telephone to make private voice calls, etc., the ship's satellite telephone was expensive and could not handle data transmission. Therefore, it is probable that the Vessel approached land, etc., so that crew members could use their own smartphones for data transmission, etc.

(2) On the other hand, when the Master approached the land, etc., for the purpose of receiving a smartphone signal, other crew members did not point out the danger of doing so to the Master, and therefore it is probable that their awareness with respect to safe navigation had been lowered and risk acceptability[*38] increased with unsafe behaviors.

[*38] "Risk acceptability" concerns to the extent to which a person is willing to accept danger. It refers to the tendency to accept a danger even when the danger has been perceived.

3.2.9 Analysis of Alcohol Consumption

According to 2.1.3(2) and 2.10, the JTSB concludes that the situation was as follows.

(1) At around 17:00 on July 25, the Master left the bridge to join a birthday party, where he consumed about two glasses of whiskey and water. From this, it is somewhat likely that the Master's breath alcohol concentration at the time of the Accident was a minimum of 0.30 mg/ℓ and a maximum of 0.37 mg/ℓ (for an average of 0.75 mg/mℓ [0.075%] in terms of blood alcohol concentration) when converted using the Widmark formula.[*39]

(2) Although the Master was not a bridge watchkeeper, it is probable that he should have been more cautious concerning his consumption of alcohol given that he was in charge of training crew members and that he had changed the passage plan and the Vessel was already on a course approaching the coast.

3.2.10 Analysis of the Accident's Occurrence

According to 3.1.1, 3.1.2 and 3.2.4, the JTSB concludes that it is probable that, in summarizing the circumstances of the Accident, the situation was as follows.

(1) On July 23, as the Vessel was proceeding southwest in the Indian Ocean, she changed her passage plan on the Master's orders to make her distance from Mauritius's coast approximately 5 M for the purpose of receiving a smartphone signal, and at around 13:15 on July 25, she changed her course from 239° to 241° for the purpose of approaching even closer to the island.

(2) From around 17:00 on the day of the Accident, Navigation Officer A_1 had been on bridge watch performing lookout, checking position, steering, and conducting other duties alone with the Master's permission.

(3) At around 18:30, the Master ordered a reduction in speed from approximately 11.8 kn to approximately 10.6 kn. It is somewhat likely that this order was intended to extend the time for receiving a smartphone signal.

(4) At around 18:40, Navigation Officer A_1 was intending to navigate parallel with Mauritius's coast at a distance of 2 M, but he was not measuring ship position and, at around 19:15, the Vessel's distance to the island's coast reached approximately 1.5 M.

(5) At around 19:18, the Master noticed that the distance from the coast was 1.5M, and Navigation Officer A_1 changed the course to 227°. However, it is probable that the Master and Navigation Officer A_1 were not aware that the Vessel was heading for shallows in Mauritius's southeast region because they had not obtained Charts, etc., for the area around the island noting the coastline and other features in detail.

(6) The Master and Navigation Officer A_1 were continuing to chat about the smartphone signal as the Vessel approached Mauritius.

(7) The Vessel continued navigating on a course approaching the shallows in Mauritius's southeast region with the Master and Navigation Officer A_1 giving their attention to the smartphone signal, and she consequently grounded on the shallows at around 19:25.

3.3 Analysis of the Oil Spill and its Control

3.3.1 Analysis of the Oil Spill

According to 2.1.4, 2.3 and 2.4, the JTSB concludes that it is probable the situation was as follows.

(1) The Vessel carried a total of approximately 4,100 tons of fuel oil in her fuel oil tanks and other locations at the time of the Accident.

(2) After grounding, the Vessel experienced increased pitching and rolling as sea conditions worsened and her hull sustained buckling and other damage as a result of being struck against the seafloor. On August 6, approximately 1,000 tons of fuel oil spilled onto the sea surface from a rupture in the plating shell near her No. 1 fuel oil tank (starboard) equivalent to more than 80% of the approximately 1,191 tons that remained in that fuel oil tank that was caused by cracking that occurred and spread as a result of the buckling.

(3) The spilled oil was continuously subjected to winds and currents from the southeast and east-

[*39] The "Widmark formula" is a method for calculating the concentration of alcohol in the blood (breath) at a specific time when the amount of alcohol consumed and the time of consumption are specified.

southeast. Under their influence, the oil spread toward the north-northwest, with some washing ashore on the coast and other areas of southeast Mauritius.

3.3.2 Analysis of Oil Spill Control Efforts

According to 2.1.4 and 2.4, the JTSB concludes that the response to the oil spill was as follows.

(1) Government of Mauritius

In response to the Accident, the Government of Mauritius executed its NOSCP on July 25 and, after observing the flow of the oil spill, issued a Declaration of Environmental Emergency on August 6.

The Government of Mauritius had established the NOSCP for the purpose of responding to oil pollution in its territorial waters and exclusive economic zone, and it deployed large oil fences and other equipment and materials for dealing with a spill classified as Tier 1 (up to 10 MT) under it. However, it is certain that, because of confirmation that the damage from the oil spill resulting from the Accident corresponded to Tier 3 (100 MT or more), the Government of Mauritius requested assistance from other countries and international agencies and organizations for spill oil recovery and other operations and provided information and notifications concerning the situation.

(2) Company A, etc.

1) Company A entered into a salvage contract with the Salvage Team that established both companies as co-contractors.

2) Because the Salvage Team did not have the tugboats, etc., necessary to perform salvage work near Mauritius and was unable to charter them from other countries, it took at least five days for tugboats, etc., to arrive at the Accident location.

The Salvage Team was subjected to restrictions on entering Mauritius and isolation after entering the country to prevent the spread of COVID-19, and it is highly probable that the effects of those measures helped to delay the start of salvage work.

3) The Salvage Team planned towing the hull offshore with the support vessel before damage to the Vessel worsened, checking the hull's condition, and then removing remaining oil; and it proposed this work plan to the Government of Mauritius. However, the government indicated that it wanted the fuel oil removed on site first. Therefore, the Salvage Team decided on August 5 to remove the remaining oil from the hull where the Vessel was grounded and attempted to secure available tankers from around Mauritius for this task, but all tankers were chartered and none were available. Consequently, the Salvage Team began the work of removing fuel oil from the Vessel on August 7 using three tankers chartered by the Government of Mauritius and completed the work on August 12.

4) Company A dispatched two employees to Mauritius to work locally on August 11 and also secured two cleaning companies to conduct oil control operations that included recovering and cleaning up onshore oil. Beginning on August 19, oil control operations were mainly handled by these two companies, taking over from the Government of Mauritius's Special Mobile Force, Mauritius Coast Guard, and fishermen and other local residents who had been responding to the Accident since immediately after it occurred.

5) By the end of August 2020, no more large lumps of floating oil were observed on the sea surface. The completion of operations was confirmed by a completion survey conducted on January 27, 2021, by the Government of Mauritius and an environmental research company commissioned by the Government of Mauritius.

(3) Other nations, international organizations, etc.

The Accident caused oil spill damage corresponding to Tier 3 of the Government of Mauritius's NOSCP. After the Government of Mauritius confirmed that an oil spill had occurred, it requested assistance from other countries, international organizations, and others and provided information. Many countries including Japan and international organizations responded to this request by dispatching personnel, providing equipment and materials, and providing technical assistance.

It is probable that a large portion of the spilled oil was successfully recovered and cleaned up as a result.

The results of these activities by other countries and international organizations were extremely

effective in preventing damage from the oil spill, and demonstrate the importance of establishing and maintaining international cooperation.

4 CONCLUSIONS

4.1 Probable Causes

(1) Probable Cause of the Accident

It is probable that the cause of the Accident was that, as the Vessel was proceeding west-southwest off to the east-northeast of Mauritius without obtaining Charts, etc., showing detailed representations of the coastline and other features of Mauritius, the Master changed the passage plan and the Master and Navigation Officer A_1 continued navigating on a course approaching shallows in the island's southeast region with their attention drawn to smartphone transmission, and consequently the Vessel grounded on the shallows.

It is probable that the Master changed the passage plan in order to take a course approaching Mauritius for the purpose of receiving a smartphone signal.

It is probable that the Vessel did not obtain detailed Charts, etc., for the area around Mauritius because the Master thought they were unnecessary, as the Vessel was not scheduled to enter port at Mauritius.

It is probable that the Vessel had repeatedly approached land, etc., in the past to receive a smartphone signal, and that low awareness with respect to safe navigation and a higher risk acceptability among the crew as a whole were involved in the occurrence of the Accident.

(2) Probable Cause of the Damage (Release of Fuel Oil)

It is probable that the cause of the damage was that, under conditions in which it took at least five days for tugboats to arrive after the grounding, and which even after their arrival, the tugboats were unable come alongside the hull and join a tug line due to worsening sea conditions, the Vessel's hull buckled after striking against the seafloor, causing a rupture in the plating shell near a fuel oil tank, and consequently approximately 1,000 tons of fuel aboard remaining in the tank spilled onto the sea surface and polluted the coasts of southeastern Mauritius.

It is probable that Mauritius's regional circumstances, worsening sea conditions, and the effects of COVID-19-related isolation measures were involved in the release of fuel oil from the rupture caused by the hull's buckling and the spread of damage caused by the oil spill.

4.2 Other Identified Safety Issues

(1) It is probable that, because the Vessel's crew members did not have a correct awareness of the provisions of the SMS Manual concerning matters necessary to ensure safe navigation, such as distance from shore, etc., that Company A must ensure that crew members who will board its managed vessels accurately understand the contents of SMS Manual before having them board and provide them with training on SMS Manual after they have boarded.

(2) It is probable that neither Company A nor Company B had a firm grasp of the Vessel's passage, and that neither had a system that could immediately recognize and issue an alert concerning the Vessel's behavior even in cases in which she changed her passage plan, left her planned course, and approached land, etc.

(3) It is probable that the Master, in his capacity as the person in charge of training crew members, should have been more cautious concerning his consumption of alcohol when, as in this case, the Vessel was on a course approaching a coast.

(4) In view of the special characteristics of life aboard ship, which differs from life on land, it is desirable that Company C promote the introduction of equipment capable of fixed-fee data transmission on vessels that engage in long-term international navigation.

5 SAFETY ACTIONS

5.1 Safety Actions Taken

As stated in 4.1, it is probable that, as the Vessel was proceeding west-southwest off to the east-northeast of Mauritius without obtaining Charts, etc., showing detailed representations of the coastline and other features of Mauritius, the Master changed the passage plan to receive a smartphone signal and continued navigating on a course approaching shallows in the island's southeast region, and consequently the Vessel grounded on the shallows.

It is probable that low awareness with respect to safe navigation and a higher risk acceptability among the Vessel's crew members were involved in the occurrence of the Accident.

Accordingly, crew members must implement the following measures to prevent the occurrence of a similar accident.

(1) Crew members must not engage in any unsafe behaviors, such as approaching the shore, etc., for personal reasons.

(2) Sailing in coastal waters, masters and navigation officers must obtain appropriate charts and other nautical publications for planned areas of navigation and prepare passage plans with careful thought to ensure their vessels' safety, and must endeavor to operate their vessels safely by conducting appropriate watchkeeping (lookout) and checking ship's position at all times.

(3) Masters must station bridge watchkeepers with the proper personnel.

5.2 Actions to be Taken to Address the Other Identified Safety Issues

In light of the fact that multiple companies were involved in the Vessel's operation, it is probable that each concerned company must further increase its involvement in safe operation in the ways described below in order to address the matters described in 4.2.

(1) Company A

Implementation of the measures described in 1) to 5) is required; implementation of measure 6) is desired.

1) Thoroughly instruct crew members that they are to strive to control risk acceptability by repeatedly providing education and training that teaches them to avoid unsafe behaviors, such as altering routes for personal reasons.

2) Thoroughly instruct masters and navigation officers on the matter described in 5.1(2) to ensure that they will endeavor to operate their vessels safely.

3) Provide thorough instruction to masters to ensure that bridge watch is conducted with the proper personnel.

4) Have crew members who are newly boarding the company's managed vessels accurately understand the contents of the company's SMS Manual before boarding and continuously provide them with education on the SMS Manual after their boarding.

5) Verify by AIS information or other means that vessels' passage plans are prepared according to the SMS Manual's procedure and whether vessels are deviating from the courses provided in those passage plans.

6) Develop a system for the timely sharing of information on ship position between Company A and masters.

(2) Company B

Implementation of the measures described in 1) and 2) is required.

1) Actively participate in the safety measures to be implemented by the management company (5.2(1) above) to ensure the safe navigation of the chartered vessels.

2) Strengthen the onshore monitoring system for vessels in operation, and consider establishing a system, etc., that provides notification by alarm when a vessel is approaching waters where the risk of grounding or other dangers exist.

(3) Company C

In view of the special characteristics of life aboard ship, which differs from life on land, promoting the introduction of equipment capable of fixed-fee data transmission on vessels that engage in long-term international voyage is desired.

5.3 Safety Actions Taken Following the Accident

5.3.1 Opinions to the Minister of Land, Infrastructure, Transport and Tourism

On June 30, 2022, the Japan Transport Safety Board expressed its opinions based on its investigations and analyses to that date and pursuant to Article 28 of the Act for Establishment of the Japan Transport Safety Board that the Minister of Land, Infrastructure, Transport and Tourism should take the following measures in order to improve the safety of vessels in in Japan's merchant fleet[*40] for which multiple companies are involved in operation and prevent similar accidents:

(1) Provide guidance to management companies to ensure their execution of the following items:

1) Thoroughly instruct crew members to strive to control risk acceptability by repeatedly providing education and training to them to ensure that they do not engage in unsafe behaviors, such as altering routes for personal reasons.

2) Thoroughly instruct masters and navigation officers to obtain appropriate charts and other nautical publications for planned areas of navigation, to formulate passage plans with careful thought to ensure their vessels' safety, and to endeavor to operate their vessels safely by conducing appropriate watchkeeping (lookout) and checking ship's position at all times.

3) Provide thorough instruction to crew members to ensure that bridge watch is conducted with the proper personnel prescribed in the company's SMS Manual.

4) Have crew members who are newly boarding the company's managed vessels accurately understand the contents of the company's SMS Manual before boarding and continuously provide them with education on the SMS Manual after their boarding.

It is also desirable to instruct masters and management companies to establish a system for the timely sharing of information on ship position between masters and the company until a land based system for monitoring and ascertaining vessel movements is established.

(2) Provide guidance to charterers to ensure their execution of the following items:

Actively participate in the safety measures to be implemented by the management company ((1) above) to ensure the safe navigation of chartered vessels.

Additionally, in view of the special characteristics of life aboard ship, which differs from life on land, providing guidance to the persons concerned so that they improve working environments to make it easier for seafarers to work—for example, by ensuring convenience in life aboard ship by taking such steps as introducing of equipment capable of fixed-fee data transmission—on vessels that engage in long-term international voyages is desired.

5.3.2 Measures Implemented by the Safety Policy Division, Maritime Bureau, MLIT : (Ministry of Land, Infrastructure, Transport and Tourism, Japan)

(1) The Safety Policy Division compiled Safety Actions based on the opinions of experts and with reference to the presumed causes of the Accident reported by Company A and Company B and measures to prevent recurrence, and on March 24, 2021, the Division made it known among members of The Japanese Shipowners' Association (JSA) through the JSA that they should make further safety improvements and foster a culture of safety.

(2) Based on the Opinions to the Minister of Land, Infrastructure, Transport and Tourism of 5.3.1 above, the Division issued the request shown in Annex Table 5, dated June 30, 2022, to the JSA to continue actively working through its members to improve safety and foster a culture of safety in the oceangoing shipping business in their management companies, charterers, and other interested parties.

[*40] "Japan's merchant fleet" refers to the fleet of ocean-going merchant ships of 2,000 gross tons or more that are operated by Japanese ocean-going shipping companies. It consists of (1) Japanese-flagged ships (i.e., ships owned by Japanese citizens, companies established under Japanese law, etc.) and (2) foreign-flagged ships (i.e., ships chartered by foreign companies [including overseas subsidiaries of Japanese ocean-going shipping companies]). Japan's merchant fleet handles 63.1% of Japan's total maritime trade. (Source: MLIT, "Maritime Bureau Annual Report 2020")

5.3.3 Safety Actions Taken by Company A

Company A formulated the following safety actions and made them known to the crew members of all of its ships.

1 Measures to Prevent Reoccurrence of the Lack of Safety Awareness
- (1) Pre-Boarding Briefing
- (2) Evaluation of Senior Officers
- (3) Reminding of Safety Awareness by Circular
- (4) Visiting Ship for Conversation with Ship's Crew
- (5) Evaluation of Onboard and Working Conditions

2 Measures to Prevent Reoccurrence of Insufficient Awareness and Implementation of the Regulations Necessary for Safe Navigation
- (1) Strict Compliance with Voyage Regulations
- (2) Education on Operation of Electronic Digital Charts
- (3) Introduction of Fail-Safe[*41] for Operation of Electronic Digital Chart

3 Additional Hardware Support
- (1) Strengthening Deterrence Capabilities by Installing Surveillance Cameras in Ship's Bridge
- (2) Improvement of Ship Communication Equipment
- (3) Introduction of Ship Movement Monitoring System

5.3.4 Safety Actions Taken by Company B

Company B formulated the following safety actions and decided to make them known to the relevant people in the company and implement them throughout the company.

1 Addressing the lack of safety awareness
- (1) Warning by circular
- (2) Holding safety campaigns (dialogue with crew members)
- (3) Conducting a safety awareness survey for crew members on navigation watch duties

2 Addressing the lack of awareness of regulations on safe navigation and insufficient performance
- (1) Provide education related to Operation of Electronic Digital Charts
- (2) Introduction of Fail-Safe for Operation of Electronic Digital Charts
- (3) Ensure thorough awareness and performance in line with guidelines necessary for safe navigation, through circulars and safety campaigns as mentioned above 1

3 Enhancement of ship operation quality
- (1) Strengthen support system from shore side
  - 1) Improve the skills of personnel in charge of operations and review operational procedures
  - 2) Enhance support provided by the Safety Operation Supporting Center
- (2) Enhance involvement with shipowners
  - 1) Hold liaison meetings and mutual visits with shipowners
  - 2) Strengthen participation in the selection of senior officers
  - 3) Review quality standards/evaluation criteria regarding hull material and safety management system

4 Response on hardware side
- (1) Strengthen deterrent capacity by monitoring cameras on bridge
- (2) Upgrade onboard communication systems

In addition, Company B established a representative office in the Republic of Mauritius and is engaged in support activities that include protection of the natural environment as part of its efforts to restore the environment and contribute to local communities in Mauritius.

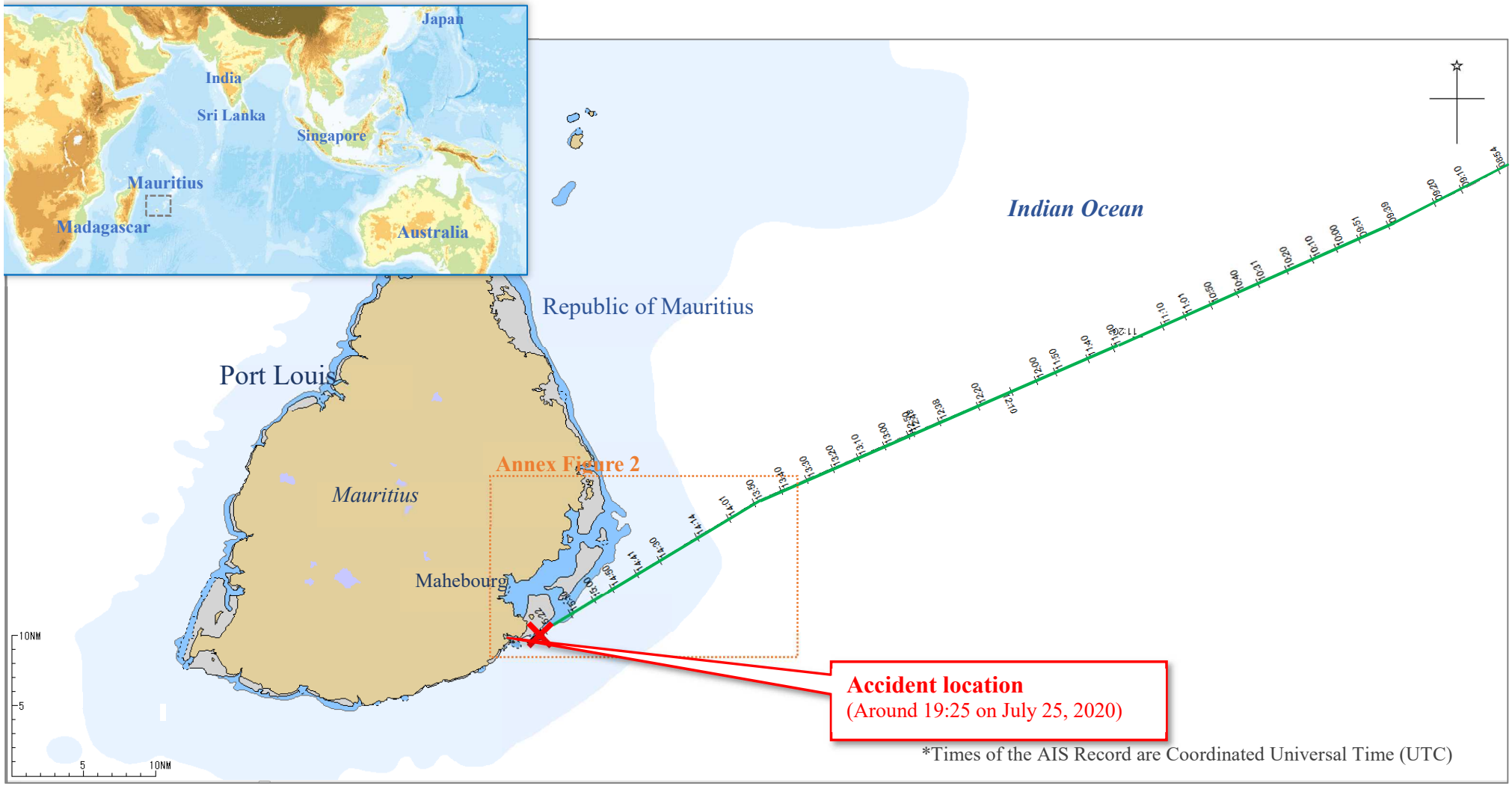
5.4 International Cooperative Framework for Preventing the Spread of Damage Caused by Oil Spills

In light of the oil spill associated with the Accident (3.3.2), it is desirable from the standpoint of

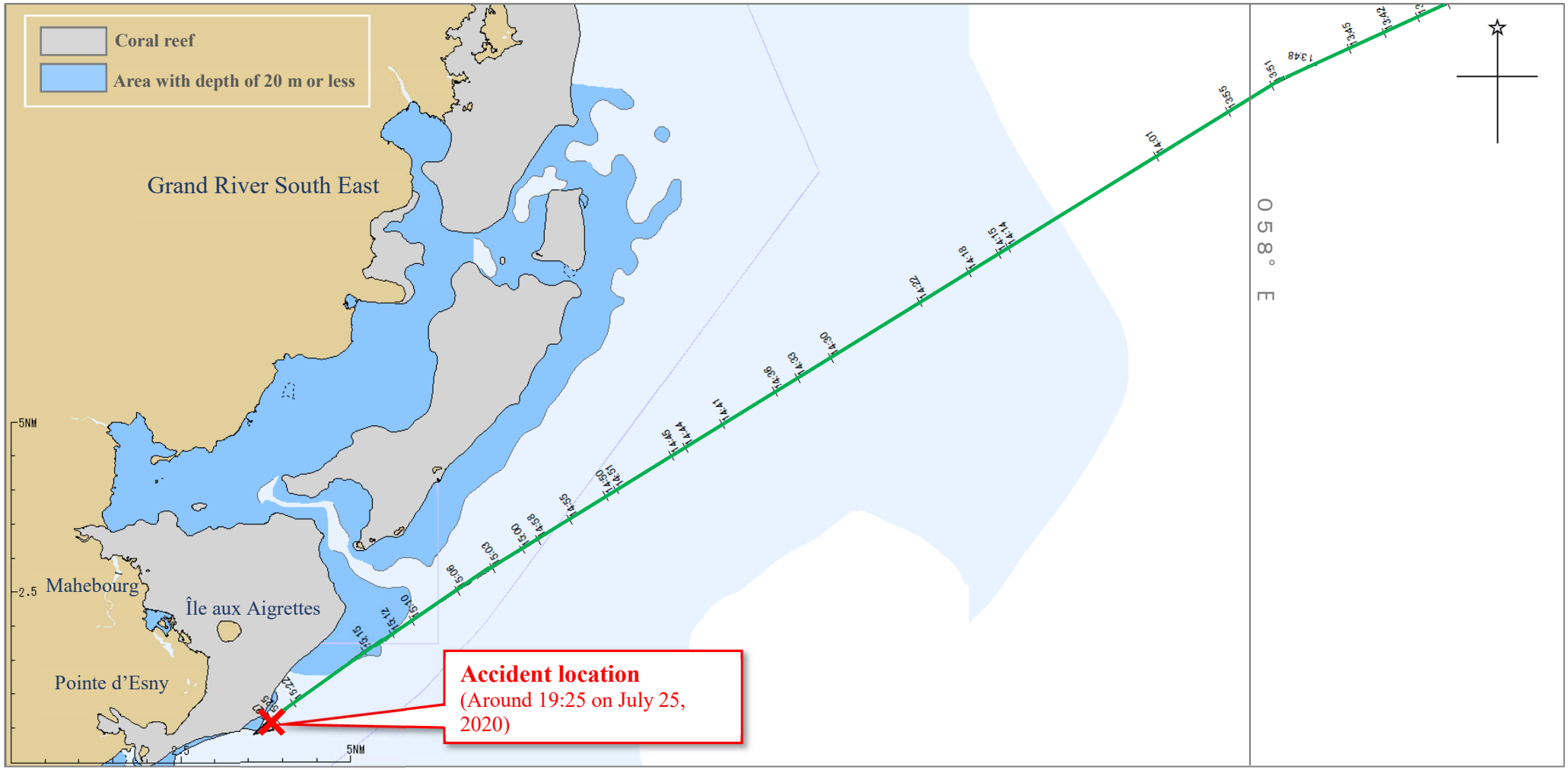
[*41] The term "fail-safe" refers to a system that operates safely even if a malfunction or erroneous operation of its equipment, etc., occurs. (According to Company A and B, they introduced an ENC purchasing system that automatically obtains ENCs for a set route without the crew having to request them as a fail-safe in the operation of electronic charts.))

preventing the spread of oil spill-caused damage to continue maintaining close coordination among countries and organizations so that the international framework for preparation, response, and cooperation in tackling oil pollution continues to function effectively.

Annex Figure 1　Estimated Navigation Route

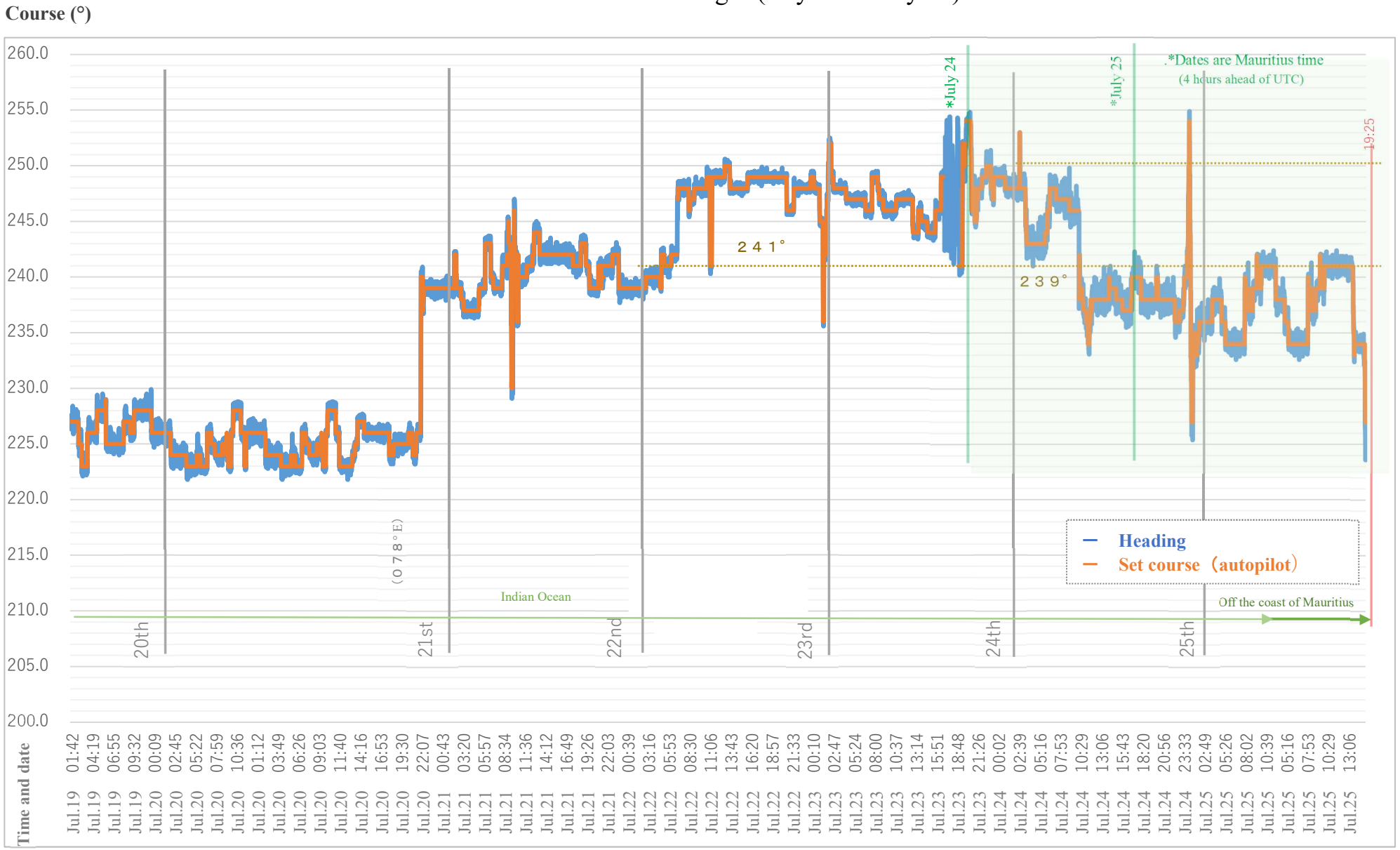


Annex Figure 2　Estimated Navigation Route (Enlarged)

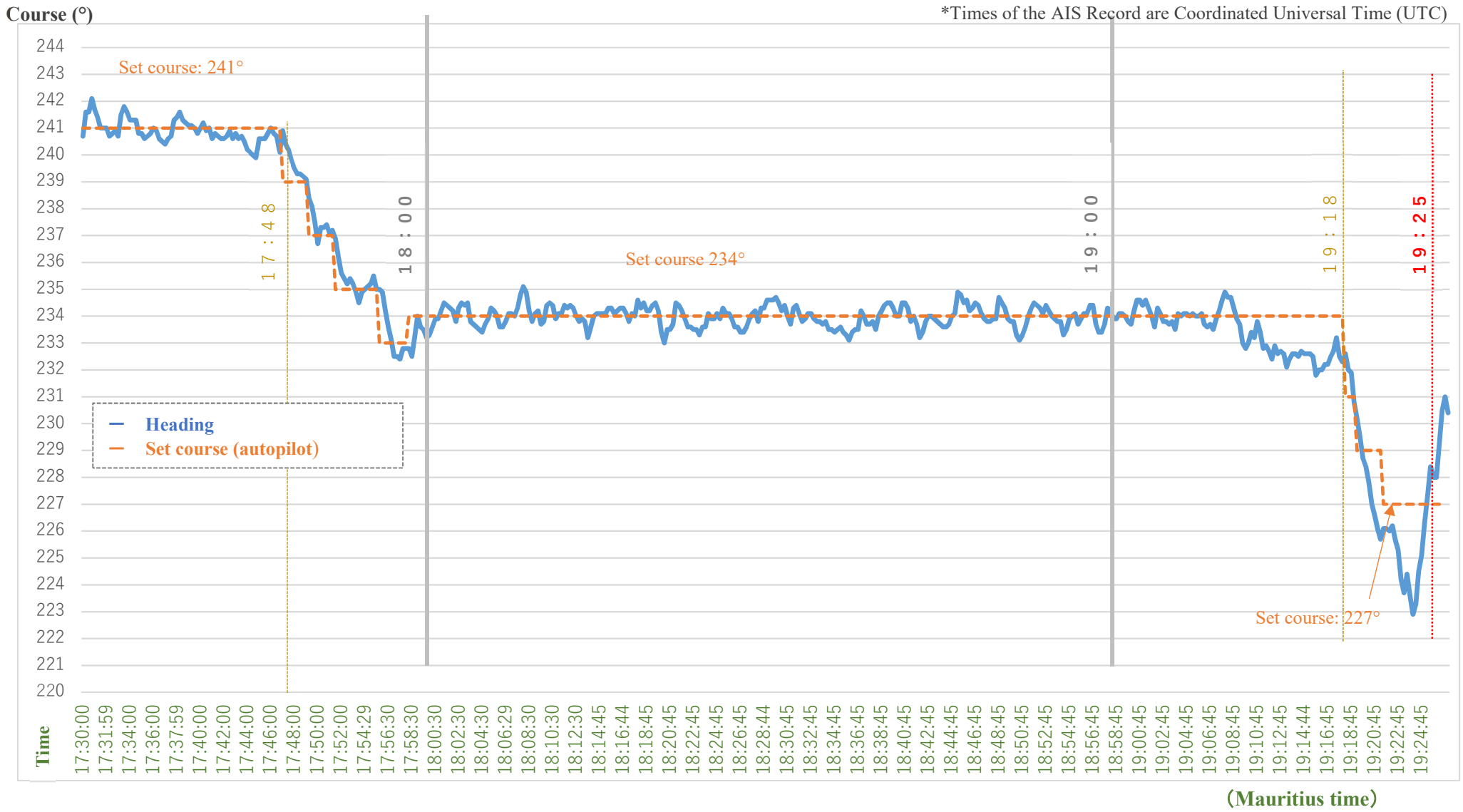


*Times of the AIS Record are Coordinated Universal Time (UTC)

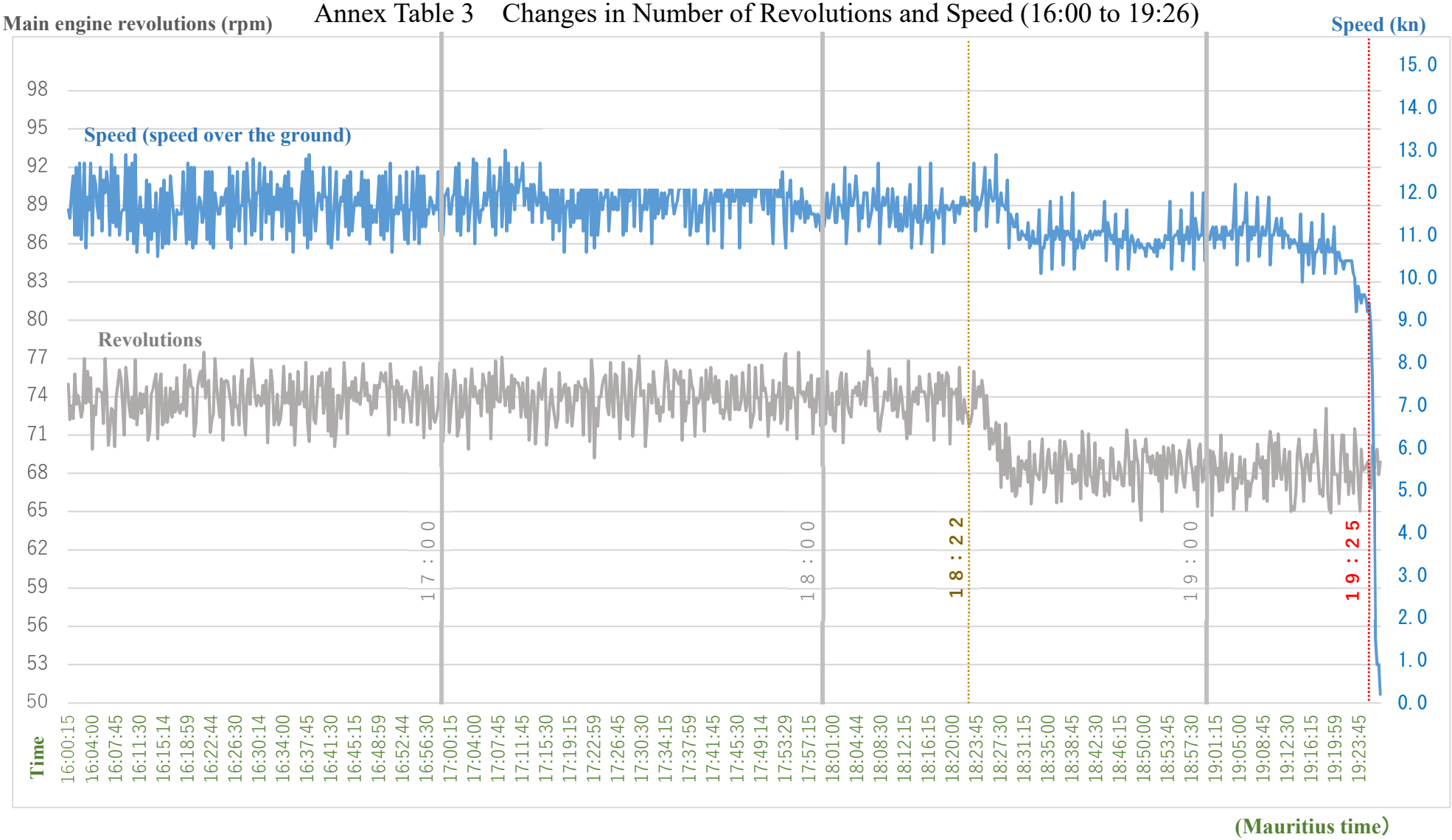
Annex Table 1　Course Changes (July 20 to July 25)



Annex Table 2　Course Changes (July 25, 17:30 to 19:26)



Annex Table 3　Changes in Number of Revolutions and Speed (16:00 to 19:26)



Annex Table 4: VDR Voice Communication (Excerpt)

TIME (HH:MM:SS)	Speaker	Contents ※ Blue texts: tentative translations of conversations in Hindi.
16:02:21	Master	Wow, Mauritius. Heading 240, 244, 241, 244
	Nav Officer A_1	We can see the land. Again it became cloudy…
16:02:55	Master	41 miles
	Nav Officer A_1	What is the course now?
	Nav Officer A_2	241 sir, I go down.
	Master	Okay, go, go party chale neeche, go down.
	Nav Officer A_1	At what time party starts?
	Nav Officer A_2	Maybe now.
17:51:14	Nav Officer A_1 → Master/Chief Engineer	Good evening.
17:51:19	Master	Have you got signals?
17:51:19	Nav Officer A_1	I got few messages. I'm trying to look this country list but messages are not coming properly.
	Master	We will get after sometime.
17:54:30	Nav Officer A_1	I had got 4,000 RU whatever the package should be … I'll try check the countries. It's working in 10 countries… for Chile and Brazil. Mauritius also should work.
17:55:17	Master →Nav Officer A_1	Bring your smartphone here, Galaxy! If you put it in a corner, it moves there. Is your Hot Spot on? Thank you very much connected to Wi-Fi.
17:55:40	Nav Officer A_1	Sir, Cadet let him down?
	Master	I don't mind. I don't mind.
17:56:32	Nav Officer A_1	Shall I try it?
17:56:43	Master	Try it.
17:56:46	Master	OK Signal.
17:57:08	Nav Officer A_1	Not get anything… only edge..
18:04:30	Master	Whats App?
18:04:48	Nav Officer A_1	No, (it's) Wi-Fi.
	Master	Yes! Yes! Yes!!
18:04:59	Master	We are getting messages.
18:07:00	Master	What are we making good?
	Nav Officer A_1	We are making good at 238.
	Master	OK.
18:07:50	Nav Officer A_1	I have given some port helm..
18:24:12	Master	We will be going like this…
18:33:00	Master	How close we can go yaar, Now how far we now? It will be like 2 miles if we go like this.
18:37:00	Nav Officer A_1	Now we are 11 miles now. We go like this parallel to the coast.
	Master	Just keep going till nobody calls us.
18:38:20	Nav Officer A_1	RPM not reduced?
	Master	Reduced, reduced, already reduced.
19:02:12	Master	Let's check mobile..
19:02:28	Master	What happened?
19:02:45	Master Nav Officer A_1	You really all charged? No, recharged.
19:07:59	Chief Engineer	No internet connection yet.
19:08:09	Master	Because just recharged.
19:08:16	Master	Maybe the internet will be connected soon.
19:12:12	Master	How far we came?
19:12:25	Nav Officer A_1	Now we are 20 miles.
19:13:53	Master	Activate.
19:16:09	Nav Officer A_1	Activate. You got some messages?
19:17:06	Nav Officer A_1 Master	You got some messages? Yes.

19:17:14	Master	Yet Yet, depth 15.6
19:17:45	Master	We are not going ground na?
	Nav Officer A 1	No, no, no. Don't worry.
19:18:01	Master	We are very very close to the land. Just one and a half miles.
19:18:50	Master	If we cannot get it now then we will not get it…
	Nav Officer A 1	Sorry, sir.
19:19:02	Master	We cannot get it now, then we will not get it.
19:21:27	Master	Now what will I do when I get the money?
19:21:37	Nav Officer A 1	I will activate and I'll call the call centre and ask whether it is activated or not.
19:21:40	Master	Yeah OK.
19:22:15	Master →Chief Engineer	OK, OK, Sit here. I don't want to stay here…
19:22:56	Nav Officer A 1	OK, you have successfully recharged.
19:23:01	Nav Officer A 1	5,000 RU. Now I will switch off the data first.
19:23:16	Nav Officer A 1	I will check the balance.
19:23:35	Nav Officer A 1	4,600 RU. 400 RU is gone within that period of time.
19:23:43	Master	Which period of time?
19:24:24	Nav Officer A 1 Master	Activate OK Activate Yes
19:25:00	Master	…you are not activating… (not clear) How close we are?
19:25:26	Master	We are very close, we are very close, my heart is beating, shit! Oh, my God! How close we are passing yaar.
19:25:32	Master	Look at this !
	Chief Engineer	I looked it. (looking ECDIS)
19:26:04	Master	Speed is 9 knots, Oh yeah, we are going fast.
19:26:11	Nav Officer A 1	Still, we have not come to that parallel course.
19:26:14	Master	So why is it vibrating so much?
19:26:30		(Audio form VHF radio – Details unknown)
19:26:55	Master	See the depth below keel. zero … …
19:27:03	Master	Now I was telling you we were coming very close (na) but still we are here yaar , Yes, friend! See how many miles, 3 miles naa?
19:27:05		(Beep sound)
19:27:20	Master	Ship is not moving. Shit yaar. It come so close. I was telling shit. Speed is zero knot.
19:27:40	Nav Officer A 1	STOP ENGINE
19:27:50	Master	Yes, stop engine. No, no, no Not Stop Shit yaar. This is very bad thing. I was telling you go go go down. This how much yaar 120. No, yaar, we are more than…
19:28:00	Master	Go, Go!
19:28:30	Master	Ship is turning to port yaar. Stop engine. Stop engine. We are agrounded yaar. We should have put this thing on…
19:28:52	Nav Officer A 1	Stop engine, please.
	Master	Yaar why is it not turning?
19:29:15	Master	OK Start engine. Shit Shit we are fucked!! OK OK we are turning to port.
	Nav Officer A 1	Hello, sir. We go ahead now.
	Master	Yes.
	Nav Officer A 1	Yes, go ahead.
	Master	No, no, go astern, Full astern.
	Nav Officer A 1	Full Astern, Full Astern.
	Master	Full Astern.
	Nav Officer A 1	Full Astern, yeah. OK Full Astern, OK.

19:29:59	Master	Shit yaar. Ship is going to port only. Chief officer, what to do now? We have to check up.
	Nav Officer A_1	OK, we are going astern now.
19:30:22	Master	No sounding was there naa? Still we go very close yaar, we are how many miles? 3 miles yaar…
19:30:56	Nav Officer A_1	We going astern. RPM is running.
	Nav Officer A_1	RPM is showing here is 50.
19:31:09	Master	Shit. It's over. We are very close yaar. This is showing wrong position.
19:31:35	Master	Shit yaar, what I have done in my life yaar. Now, my career is gone. Chief Officer, my career is gone.
	Nav Officer A_1	Not only yours sir, mine also gone. It is showing running astern.
		（Beep sound）
	Master	Okay let it go…. At what distance are we now?
19:32:25	Nav Officer A_1	It is showing 15…. Hello. Half astern okay. Still not showing anything, not showing anything.
19:32:45	Master	Shit, shit at least should have kept 5 miles yaar, at least 5 miles, Call 2nd Officer, 3rd Officer both.
19:32:55	Master	RPM is showing okay.
	Nav Officer A_1	Yeah, but it's not moving only.
19:33:16	Master	1 knot, okay. Speed is showing.
19:33:43	Master	What is heading now? Yaar we are very close yaar, shit.
19:34:33	Nav Officer A_1	Full astern, still ship is not moving. Ok, Full astern okay. ）
	Master	Yaar, Chief Officer, yaar, you should have kept 5 miles at least. Let we go astern only as much as possible. 6 knots now.
19:36:16	Nav Officer A_1	I think sir, it something happened here.
	Master	Where?
	Nav Officer A_1	I can hear sound….
	Master	Put the check lights on. Chief Officer…
	Nav Officer A_1	I think we got… damage.
	Master	Call everybody, remove all these…
19:37:10	Nav Officer A_1	Muster Station.
	Master	We are not moving only, naa? The ship is moving now.
	Nav Officer A_1	I will ask them to go to the emergency station, okay, all crew go to the muster station, all crew go to the muster station, this is emergency.
19:37:46	Master	Speed is not showing only.
19:38:20	Master	Can you de-ballast the tank?
	Nav Officer A_1	Yes, sir.
19:39:05	Master	We are too close to shore yaar. We are just 1 mile from the shore and here it is showing 3 miles, here it is showing 1 mile naa? Here … that was what I was wondering. Chief Officer, go and de-ballast some tanks.
19:39:46	Nav Officer A_1	OK Hello, Sir, set the line, set the line by gravity please.
	Master	This is 1 mile naa, shit, we have not checked the radar, 1.4 miles.
19:39:59	Master	We have chart, 1.4 miles. Here we are here, shit, this is the, this thing yaar. We are somewhere here. If would be down naa, it would be nothing happened.
19:40:21	Nav Officer A_1	Point 2 knots.
	Master	We were not checking this yaar bloody shit. See here it is showing naa. This is actually not the chart naa. This is oh shit, I was telling you… we were going very close.
19:40:35	Nav Officer A_1	Weather fine… weather fine.
19:42:00	Master	Tell Bosun go and see the anchor.
	Nav Officer A_1	Second you call me through walkie-talkie. Yeah OK ask Bosun to keep walkie-talkie with him.
	Master	Chief Officer you go and start de-ballasting now. De-ballast from the centre.
	Nav Officer A_1	OK.
	Master	You can de-ballast by gravity now.
19:42:49	Nav Officer A_1	Yes, sir.

19:42:58	Master	Open as much as possible gravity. Yaar where are we shit, we have not checked here. We are going 1 mile. I think we might got damage.
19:43:23	Master	You inform… we can check… shit yaar, why I have not checked?
19:44:31	Master	No but there will be sand only naa.
19:44:45	Master	It is grounded yaar, it is moving.
19:44:58	Master	I am going astern shit.
19:45:36	Master	I should immediately stop it, normal speed. Shit yaar, shit, shit, shit. I altered also. I altered 2 times then also it happens.
19:45:48	Nav Officer A_3	…just continue with the astern and just wait for the de-ballasting.
19:45:57	Master	But here, it is showing 200 yaa. Shit, shit, mistakes.
19:46:53	Nav Officer A_1	Both sides anchor are OK.
	Master	OK, Chief Officer, start de-ballasting soon yaa.
19:47:00	Nav Officer A_1	Yeah, okay. Already started. Going on by gravity.
19:47:11	Master	Which tank?
	Nav Officer A_1	Cargo Hold number 6 and number 3 and…
19:47:24	Master	Yeah, Okay, you have seen any increase in anybody sounding? Any tank sounding increase?
	Nav Officer A_1	No, sir no, no we can't make out…
	Nav Officer A_3	Did you notice that? It was zero speed.
	Master	No, it was 9.
	Nav Officer A_3	Because there was no impact no.
	Master	No impact no. It is slowly and slowly. He did not see what is happening. Here, it was showing just 1 mile, there it is showing 3 miles… we have not checked this.
19:47:58		It is swells…
19:49:30		We have never seen the impact naa?
19:50:06	Nav Officer A_3	There is no impact.
19:50:16	Master	Call through walkie-talkie "Chief Officer"
	Nav Officer A_1	Captain, showing any speed now?
19:50:33	Master	No, not, yet. Ship is turning. It is not fixed. Still it is moving.I can see.
19:50:51	Master	After de-ballast, we will move.
19:51:03	Master	This is 100, this is 200 see..
19:52:00	Master	We are still in 200 meters. Maybe some shallow patch. See the depth below. Moving now, Very bad naa. This is … Mauritius… I know we are coming very close yaa. Why Chief Officer?
19:53:10	Master	It was really bad. I should have gone far.
19:54:04	Master	Chief Officer, you take the … tank also. Chief Officer take from … tank also.
	Nav Officer A_1	Okay
19:54:16	Master	…. Heading… for number 5?
	Nav Officer A_1	Number 5 about 50%, 3, 4, 100%, now I am going 3 and 4.
20:01:54	Master	I am going down… stop engine, okay.
20:08:15	Coast Guard	WAKASHIO WAKASHIO cargo ship WAKASHIO this is Mauritius Coast Guard, Mauritius Coast Guard, How do you read me, over?
20:08:30	Nav Officer A_3	Say it again, this is motor vessel WAKASHIO replying, you repeat.
20:08:45	Coast Guard	WAKASHIO WAKASHIO this is Mauritius Coast Guard, Mauritius Coast Guard, change to channel 69, 69 over.
20:09:00	Nav Officer A_3	This is the Coast Guard sir, This is correct. （Calling through walkie-talkie）Captain sir, please call on bridge, Coast Guard is calling.
20:09:10	Coast Guard	WAKASHIO WAKASHIO this is NCG NCG how do you read me?
20:09:16	Nav Officer A_3	Loud and clear,sir. In some instance Captain will talk to you because we have run aground.
20:12:35	Master	What are you saying?
20:12:45	Nav Officer A_3	Euhh this Mauritius Coast Guard was calling in 69 just just euhh answer.
20:12:45	Master	Mauritius Coast Guard, WAKASHIO.
	Coast Guard	WAKASHIO, WAKASHIO, this is Mauritius Coast Guard, Mauritius Coast Guard, is this the Captain of motor vessel WAKASHIO?
	Master	Yes this is the master of WAKASHIO speaking I suspect that my vessel is grounded, you copy?

20:13:12	Coast Guard	Message copied stand-by.
20:13:16	Master	Yeah, I suspect my vessel is grounded.
20:13:22	Coast Guard	Are you facing an engine failure, please?
	Master	What, no it is because of the drifting.
	Coast Guard	Weather or the sea.
20:13:36	Master	Yeah, weather.
20:13:55	Coast Guard	Okay, stand-by. WAKASHIO this is Mauritius Coast Guard, can you confirm your exact location please?
	Master	Yes my location. Just one minute Pipe passage we in paani aaraha hain...
20:14:23	Nav Officer A_2	This is vessel position. Do you copy? 20° 26.6 South, 057°, 44.6 East

Annex Table 5　Regarding Thorough Execution of Safety Actions based on Opinions to the Minister of Land, Infrastructure, Transport and Tourism (Safety Policy Division, Maritime Bureau, MLIT)

Kokkaian No. 30
June 30, 2022

To the President of The Japanese Shipowners' Association

Director
Safety Policy Division
Maritime Bureau
Ministry of Land, Infrastructure, Transport and Tourism

Regarding the Thorough Execution of Safety Actions Following the WAKASHIO Grounding Accident

With regard to the grounding accident of the cargo ship MV Wakashio, the Safety Policy Division issued a communication dated March 24, 2021, titled "Recommendations on Measures to Prevent Recurrence following the Wakashio Grounding Accident (Attachment:omitted)," and we understand that members of The Japanese Shipowners' Association (JSA) are already taking measures to prevent recurrence based on the said communication.

The Japan Transport Safety Board (JTSB) recently released its report titled "Interim Report of the Marine Accident Investigation(June 30,2022)" pertaining to the grounding accident of the cargo ship MV WAKASHIO (Attachment: omitted).

In the interest of preventing similar accidents in the Japanese merchant fleet, the report provides an overview of the accident and reports on the progress of the investigation and factual information from the time of the grounding that were confirmed at the time of its release, and it contains the JTSB's opinions to the Minister of Land, Infrastructure, Transport and Tourism concerning instructions to ship management companies, charterers, and other interested parties.

We request that the JSA, through its members, endeavor to disseminate and ensure compliance with the recommendations for safety actions that were issued last year (omitted) as well as the following items among its ship management companies, charterers, and other interested parties, and also to continue actively working to improve safety and foster a culture of safety in the oceangoing shipping business.

Items

(1) For management companies, implement the following:
   1) Thoroughly instruct crew members to strive to control risk acceptability by repeatedly providing education and training to them to ensure that they do not engage in unsafe behaviors, such as altering routes for personal reasons.
   2) Thoroughly instruct masters and navigation officers to obtain appropriate charts and other nautical publications for planned areas of navigation, to formulate passage plans with careful thought to ensure their vessels' safety, and to endeavor to operate their vessels safely by conducing appropriate watchkeeping (lookout) and checking ship's position at all times.
   3) Provide thorough instruction to crew members to ensure that bridge watch is conducted with the proper personnel prescribed in their company's SMS Manual.
   4) Have crew members who are newly boarding their company's managed vessels accurately

understand the contents of the company's SMS Manual before boarding and continuously provide them with education on the SMS Manual after their boarding.

It is also desirable to instruct masters and management companies to establish a system for the timely sharing of information on ship position between masters and the company until a land-based system for monitoring and ascertaining vessel movements is established.

(2) For charterers: Actively participate in the safety measures to be implemented by the management company ((1) above) to ensure the safe navigation of chartered vessels.

(3) For interested parties: In view of the special characteristics of life aboard ship, which differs from life on land, improving working environments to make it easier for seafarers to work—for example, by ensuring convenience in life aboard ship by taking such steps as introducing of equipment capable of fixed-fee data transmission—on vessels that engage in long-term international voyages is desired.