

MA2019-12

**MARINE ACCIDENT  
INVESTIGATION REPORT**

**December 19, 2019**



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  
Chairman  
Japan Transport Safety Board

Note:

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

# MARINE ACCIDENT INVESTIGATION REPORT

November 20, 2019

Adopted by the Japan Transport Safety Board

Chairman TAKEDA Nobuo


Member SATO Yuji

Member TAMURA Kenkichi

Member KAKISHIMA Yoshiko

Member OKAMOTO Makiko

<b>Accident type</b>	Collision with seawall
<b>Date and time</b>	Around 01:47 on October 1, 2018 (local time, UTC+9 hours)
<b>Location</b>	Kawasaki section, Keihin Port, Kanagawa Prefecture (seawall at JFE Steel in Ogishima) Around 355° true bearing, 550 m from Toden-Ogishima LNG Berth Light (approximately 35°28.5' N, 139°44.3' E)
<b>Summary of the Accident</b>	Under the situation where Typhoon No. 24 was approaching, while being anchored at an anchorage in Yokohama section, Keihin Port, a cargo ship, MARINA, with 12 crew members, including the master, dragged the anchor and drifted toward to the northeast, and collided with the seawall at Ogishima, Kawasaki section. MARINA suffered dents, etc. to her starboard stern. The seawall suffered collision damage, etc.
<b>Process and Progress of the Investigation</b>	(1) Set up of the Investigation The Japan Transport Safety Board appointed an investigator-in-charge and two other marine accident investigators to investigate this accident on October 1, 2018. (2) Collection of Evidence On-site investigation and interview on October 1 and 2, 2018; interview on October 4 and 15, 2018; on-site investigation and interview on October 18, 2018; collection of questionnaire on November 19 and December 7, 2018 and March 8, 2019 (3) Comments from Parties Relevant to the Cause Comments on the draft report were invited from parties relevant to the cause of accident. (4) Comments from the Flag State Comments on the draft report were invited from the Flag State of the MARINA.
<b>Factual Information</b>	
Vessel type and name	Cargo ship MARINA (Nationality: Belize)
Gross tonnage	1,920 tons
Vessel number	9369784 (IMO Number)
Owner, etc.	CREDIT OCEAN SHIPPING CO., LTD

<p>Management company</p> <p>L×B×D, Hull material</p> <p>Engine, Output</p> <p>Date of launch, etc.</p>	<p>CREDIT OCEAN SHIPPING CO., LTD</p> <p>79.40 m x 13.60 m x 7.00 m, steel</p> <p>Diesel engine, 1,323 kW, 2006 (laying down)</p> <p>(See Photograph 1)</p>  <p style="text-align: center;">Photograph 1: The vessel</p>
<p>Crew Information</p>	<p>Master (Nationality: People's Republic of China), male, 47 years old Certificate of Master (issued by Belize) Date of issue: June 12, 2018 (valid until October 15, 2019)</p> <p>Chief Officer (Nationality: People's Republic of China), male, 35 years old Certificate of Chief Officer (issued by Belize) Date of issue: July 12, 2018 (valid until November 26, 2020)</p> <p>Chief Engineer (Nationality: People's Republic of China), male, 55 years old Certificate of Chief Engineer (issued by Belize) Date of issue: July 10, 2017 (valid until March 31, 2019)</p>
<p>Injuries to Persons</p>	<p>None</p>
<p>Damage to Vessel (or Other Facilities)</p>	<p>Vessel: There were dents including broken holes and cracks at the starboard stern and bottom, breakage of the rudder, bending and partial breakage of the propeller blades, and loss of the starboard anchor and chain cable. (Total loss of the ship).</p> <p>Seawall: There were crushed sections and cracks on the concrete breast wall</p> <p>(See Photographs 2 and 3.)</p>



Photograph 2: Situation of damages to the vessel

On the land side



On the sea side



Photograph 3: Situation of damages to the seawall

Weather and Sea Conditions

(1) Situation of announcement of a typhoon warning<sup>1</sup>

The Japan Meteorological Agency announced a typhoon warning for the northern part of the waters of the Kanto District at 23:35 on September 29th, and the warning was still valid at the time of the accident.

(2) Changes in wind direction and velocity near the anchorage

According to the observation values at the Yokohama Local Meteorological Observatory (about 3 nautical miles west from the anchorage), south-southeast wind started to become stronger around 19:30 on September 30th, and the maximum instantaneous wind velocity exceeded 35 m/s around 00:00 on October 1st.

(See Table 1.)

Table 1: Changes in wind direction and velocity near the anchorage

Date	Time	Wind direction and velocity (m/s)
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<sup>1</sup> The term "typhoon warning" means a marine warning announced by the Japan Meteorological Agency when there is a phenomenon where the maximum velocity of wind caused by a typhoon in Japanese coastal waters exceeds 64 knots or when such phenomenon is predicted to occur within 24 hours.

	(HH:MM)	Average		Maximum instantaneous	
September 30th	19:00	SSE	2.2	SSE	4.0
	19:30	SSE	9.3	SSE	16.6
	20:00	SSE	9.4	SSE	16.3
	20:30	SSE	10.2	SSE	18.6
	21:00	SSE	9.4	SSE	16.5
	21:30	SSE	10.7	SE	18.0
	22:00	SSE	11.5	SSE	21.9
	22:30	SSE	12.0	SSE	21.5
	23:00	SSE	15.6	SSE	28.2
	23:30	SSE	15.9	SE	25.4
October 1st	00:00	SSE	16.5	SSE	35.6
	00:30	SSW	16.3	SSW	32.0
	01:00	SSW	16.2	SSW	29.4
	01:30	SSW	18.7	SSW	31.8
	02:00	SSW	18.2	SSW	34.2
	02:30	SW	14.8	SW	28.5
	03:00	SSW	11.0	SSW	19.5

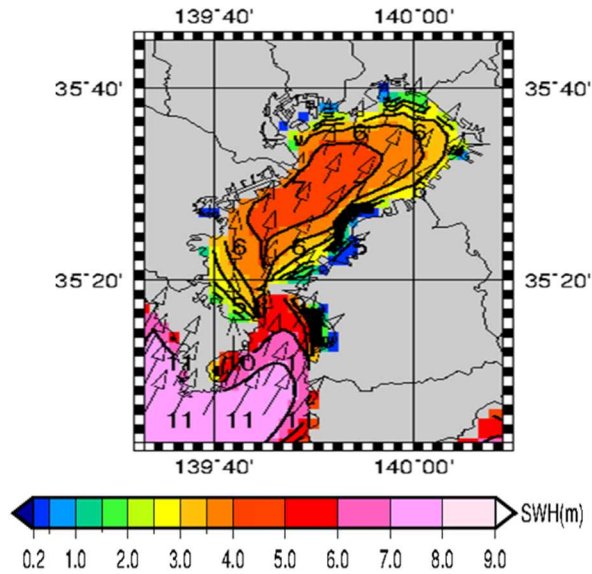
(3) Wind direction and velocity at the site of occurrence of the accident (near Toden-Ogishima LNG Berth Light)

At the time of the accident, the observation value at Toden-Ogishima LNG Berth, which the vessel passed through by drifting toward before the collision, was the south-southwest wind of about 33 m/s.

(4) Situation of waves at the time of the accident

Regarding the estimates of waves at the site of occurrence of the accident around 02:00 (around the time of the accident) on October 1st based on the Japan Meteorological Agency's Shallow-water Wave Model, the wave period was 6 to 7 s and the wave height was about 3 to 5 m.

(See Figure 1.)



Numbers in the figure: Wave period

◁ : Wave direction

Figure 1: Estimates at 02:00 on October 1st based on the Shallow-water Wave Model

Events Leading to the Accident

The vessel, with 9 crew members (of which, 6 are of the nationality of the People's Republic of China, 2 are of the nationality of the Republic of the Union of Myanmar, and 1 is of the nationality of the Republic of Indonesia) in addition to the master, chief officer, and chief engineer, departed from the Port of Chiba in Chiba Prefecture at around 16:30 on September 29, 2018 for the purpose of evacuating from a typhoon. Around 18:30, the vessel brought up with 7 shackles of the chain cable of the starboard anchor (which has 8 shackles) up to below the water surface at Anchorage Y1 at the Keihin Port and started riding at single anchor. At this time, Vessel B (gross tonnage: 1,997 tons, length over all (LOA): about 79 m) and Vessel C (gross tonnage: 1,518 tons, LOA: about 77 m) were being anchored about 280 m east and about 370 west of the vessel, respectively.

The master set an anchor watch from around 19:00 on 30th, and instructed that the main engine be placed on standby as the shaking (rolling and pitching) of the vessel started getting large from around 22:00. The main engine was placed completely on standby around 22:10.

Around 22:15, the master recognized by radar that Vessel B and Vessel C started dragging their anchors, and the shaking of the vessel also started getting more intense. Therefore, the master started using the main engine to avoid approaching those vessels.

Around 23:00, the master recognized that dragging of the anchors of Vessel B and Vessel C became prominent, and around 23:20, the master tried to let go the second anchor (port anchor) to prevent dragging of the anchor but could not let it go due to a failure in the

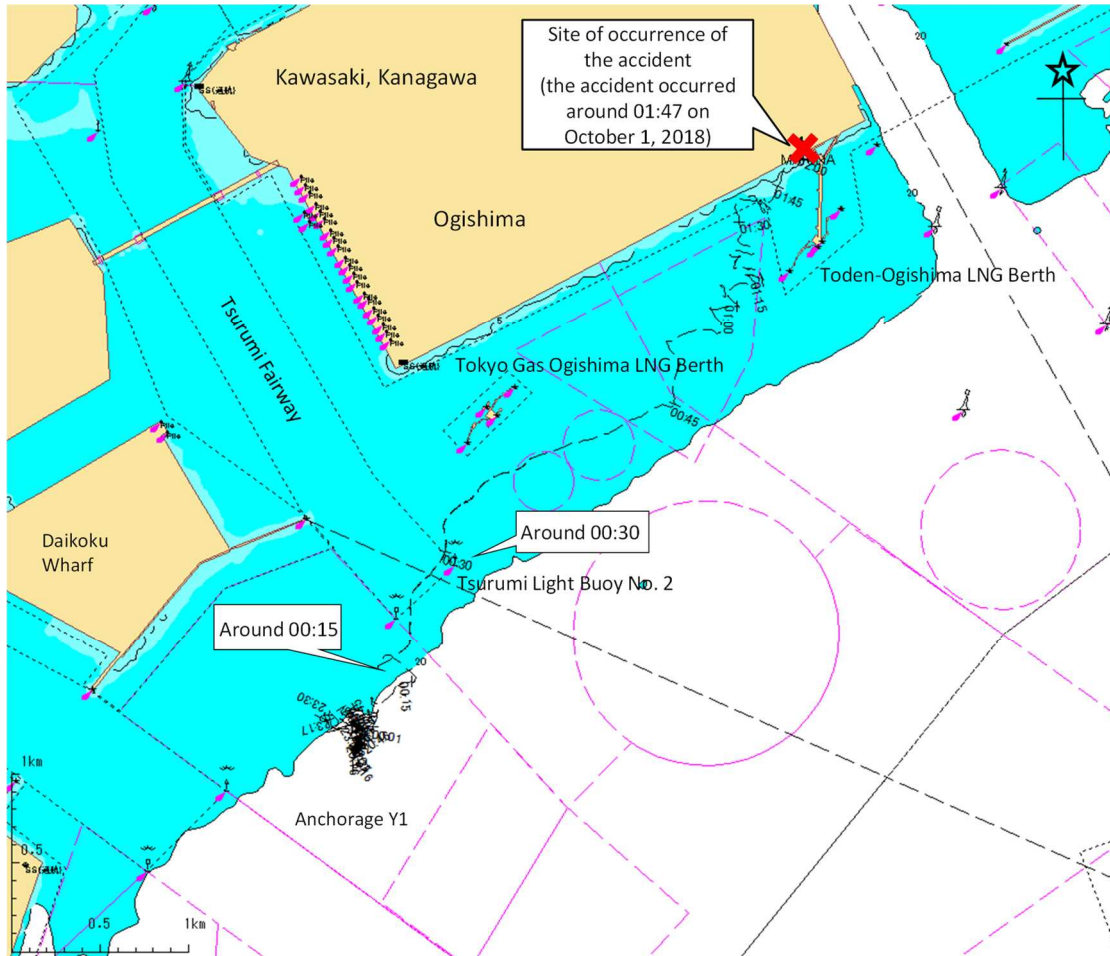
	<p>windlass.</p> <p>Around 00:15 on October 1st, the master recognized that Vessel B was approaching the vessel and avoided Vessel B by using the main engine and rudder. However, during the maneuvering for this avoidance, the vessel started dragging the anchor. Therefore, the master set the main engine to full ahead but could not stop dragging of the anchor.</p> <p>The vessel drifted toward the northeast, and collided with the seawall from the starboard stern around 01:47.</p> <p>Around 02:00, the stern was flooded, and the vessel was hit by a strong wind and the starboard was pressed against the seawall.</p> <p>All the crew of the vessel got off the vessel and landed the seawall around 02:10.</p> <p>(See Attached Figure 1: Navigation Track (Overall) and Attached Table 1: AIS Records of the Vessel (Extract).)</p>
Other Matters	<p>The master conducted the confirmation operation of the windlass as a preparation for heavy weather on the day before the accident but found nothing wrong.</p> <p>When the vessel departed from the Port of Chiba, she was in ballast and the ballast tank was full, and the bow was of about 1.40 m draft and the stern was about 3.70 m draft.</p>
<p><b>Analysis</b></p> <p>Involvement of crew members</p> <p>Involvement of vessel, engine, etc.</p> <p>Involvement of weather and sea conditions</p> <p>Analysis of the findings</p>	<p>Applicable</p> <p>Applicable</p> <p>Applicable</p> <p>(1) Analysis of the situation of anchoring</p> <p>(i) It is probable that around 18:30 on September 29th, the vessel started riding at single anchor (7 shackles of the starboard chain cable up to below the water surface) in ballast at Anchorage Y1 and conducted preparation for heavy weather and after that, the vessel was subjected to strong winds and waves associated with the approach of a typhoon from around 19:30 on 30th.</p> <p>(ii) It is probable that Vessel B and Vessel C were anchored about 280 m east and about 370 west of the anchorage of the vessel, respectively.</p> <p>(2) Analysis of weather and sea conditions</p> <p>(i) It is recognized that, with the approach of Typhoon No. 24, a typhoon warning had been announced for the waters where the accident occurred (northern part of the waters of the Kanto Area) at the time of the accident.</p> <p>(ii) It is probable that south-southwest wind with a velocity of about 33 m/s was blowing near the area at the time of the accident.</p>



	<p>(iii) It is somewhat likely that, at the time of the accident, waves near the Yokohama and Kawasaki sections at the Keihin Port were from the south-southwest and that the wave period was 6 to 7 s and the wave height had reached about 3 to 5 m.</p> <p>(3) Analysis of process from dragging of anchor to collision</p> <p>(i) It is probable that the master recognized by radar that other vessels (Vessel B and Vessel C) started dragging their anchors and he started using the main engine around 22:15 on 30th to avoid approaching those vessels.</p> <p>(ii) It is probable that the master tried to let go the second anchor (port anchor) around 23:20 to prevent dragging of anchor but could not let it go due to a failure in the windlass.</p> <p>(iii) It is probable that the vessel recognized that Vessel B was approaching the vessel and avoided Vessel B by using the main engine and rudder but that she started dragging her anchor around 00:15 on 1st as she could not use the second anchor and continued riding at single anchor.</p> <p>(iv) It is probable that the vessel drifted toward the northeast and the master set the main engine to full ahead but that the vessel could not achieve sufficient forward thrust.</p> <p>(v) It is probable that the vessel could not stop dragging anchor and further drifted toward the northeast and that she collided with the seawall from the starboard stern around 01:47.</p>
<p><b>Probable Causes</b></p>	<p>It is probable that in the accident, while being anchored in ballast at Anchorage Y1 at the Keihin Port for the purpose of evacuating from the typhoon under the situation where, during nighttime, Typhoon No. 24 was approaching and a typhoon warning had been announced for the northern part of the waters of the Kanto District, including Tokyo Bay, the vessel dragged anchor when wind waves caused by the typhoon increased because she continued riding at single anchor and that the master set the main engine to full ahead but the vessel could not achieve sufficient forward thrust and drifted toward and collided with the seawall.</p>
<p><b>Safety Actions</b></p>	<p>The following measures are possible to prevent recurrence of similar accidents in consideration of the situation of this collision due to dragging of anchor at the time of heavy weather:</p> <ul style="list-style-type: none"> <li>- Ensure sufficient holding power with the anchor and chain cable by extending the chain cable to the extent possible during anchoring and let go the anchor on the other side as needed during riding at single anchor to utilize it as an "anti-swinging anchor"</li> <li>- Place the main engine on standby in advance, continuously use the main engine and rudder in response to the wind direction and velocity that rapidly change, and maneuver the vessel to have the bow face the wind to restrain swinging motion</li> <li>- Conduct accurate prediction by obtaining the latest weather</li> </ul>

	<p>information, sea condition (typhoon) information, etc. as wind direction and velocity rapidly change at the time of passage of a typhoon</p>
<p><b>Safety Recommendations</b></p>	<p>In view of the results of this accident investigation, the Japan Transport Safety Board makes the following recommendations to CREDIT OCEAN SHIPPING CO., LTD, which is the management company of the cargo ship, MARINA, for the purpose of contribution to prevention of the recurrence of similar casualties and alleviation of damages:</p> <p>CREDIT OCEAN SHIPPING CO., LTD shall inform all the vessels it manages of the following safety actions and instruct them to implement those actions without failure:</p> <ol style="list-style-type: none"> <li>1. Ensure sufficient holding power with the anchor and chain cable by extending the chain cable to the extent possible during anchoring and let go the anchor on the other side as needed during riding at single anchor to utilize it as an "anti-swinging anchor"</li> <li>2. Place the main engine on standby in advance, continuously use the main engine and rudder in response to the wind direction and velocity that rapidly change, and maneuver the vessel to have the bow face the wind to restrain swinging motion</li> <li>3. Conduct accurate prediction by obtaining the latest weather information, sea condition (typhoon) information, etc. as wind direction and velocity rapidly change at the time of passage of a typhoon</li> </ol>

Attached Figure 1: Navigation Track (overall)



Source: Geospatial Information Authority of Japan

Attached Table 1: AIS Records of the Vessel (Extract)

Date	Time (HH:MM:SS)	Vessel position*		Course over the ground* (°)	Speed over the ground (knots (kn))
		Latitude (N) (°-′-″)	Longitude (E) (°-′-″)		
September 30th	19:01:35	35-26-37.2	139-42-35.9	208.1	0.0
	20:01:35	35-26-41.6	139-42-35.8	121.9	0.5
	21:01:35	35-26-42.4	139-42-36.4	191.0	0.4
	22:01:35	35-26-43.3	139-42-37.8	252.5	1.4
	22:10:35	35-26-43.0	139-42-36.8	080.6	0.8
	22:16:35	35-26-43.5	139-42-37.2	067.6	1.4
	23:00:07	35-26-46.2	139-42-35.4	059.2	2.4
	23:20:00	35-26-47.8	139-42-31.4	294.7	1.5
	23:30:04	35-26-47.4	139-42-28.7	220.7	1.9
October 1st	00:01:53	35-26-45.7	139-42-40.5	017.0	0.8
	00:09:46	35-26-50.5	139-42-40.3	144.8	1.6
	00:14:36	35-26-53.9	139-42-48.2	076.4	3.9
	00:25:07	35-27-03.5	139-42-48.7	001.7	6.7
	00:29:58	35-27-17.9	139-42-56.6	017.9	5.7
	00:35:02	35-27-32.5	139-43-10.0	064.3	6.2
	00:40:08	35-27-39.0	139-43-30.7	069.4	5.6
	00:50:17	35-27-56.3	139-43-46.3	318.3	1.3
	01:00:04	35-28-03.1	139-44-02.0	103.0	2.6
	01:10:10	35-28-06.7	139-44-06.1	014.8	1.8
	01:20:01	35-28-11.3	139-44-01.6	074.2	2.7
	01:29:53	35-28-17.9	139-44-02.6	331.8	5.1
	01:40:03	35-28-21.2	139-44-08.0	121.3	5.0
	01:46:56	35-28-28.7	139-44-12.7	351.8	5.1
	01:50:04	35-28-30.9	139-44-16.4	207.9	1.2
	01:59:35	35-28-31.1	139-44-16.6	047.5	0.5
	02:10:16	35-28-31.2	139-44-16.6	202.3	0.4

\* The vessel positions are the positions of the GPS antenna located on the upper side of the bridge. In addition, the course over the ground is in true bearing.